A HUNDRED YEARS OF PHILOSOPHY

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of relationship; Whitehead exhorts them to reflect upon their visceral sensations. Then they will come to see, he thinks, that appropriation and resistance – not 'the having of a blue sense-datum' – are the characteristic features not only of perception but of all the relationships which together make up the universe.

CHAPTER 15

Some Cambridge Philosophers; and Wittgenstein's Tractatus

The fruitfulness of the Cambridge Moral Science Faculty during the first decades of the present century has already been abundantly illustrated. A university which can lay claim to Moore and Russell, McTaggart and Whitehead, Ward and Stout, need fear no accusations either of sterility or of narrowness. Yet our tale is still incomplete. Other Cambridge-bred philosophers added to the University's philosophical fame; and it gave hospitality, first as an advanced student, later as a Professor, to the most remarkable – many would say the greatest – philosopher of our century, the Austrian Ludwig Wittgenstein.

Of W. E. Johnson, one of the more notable of the home-grown products, we have already spoken briefly (Chapter 6). His articles on 'The Logical Calculus' (1892) anticipated the tone, and in part the detail, of much that was later to be written in Cambridge. In the years that followed he exercised great influence as a teacher, but published nothing. Not until the nineteen-twenties did he publish his major work, with the simple title *Logic*.[1] Even then, the force of character of one of his students, rather than any impulse of his own, brought him to the point of publication. His *Logic*, indeed, is a series of manuscripts collected together to make a book – not a composition ruled by some governing idea. Its value lies in its detail; all that can now be attempted, however, is a characterization of the most general sort.

Although Johnson was trained as a mathematician, his *Logic* is essentially philosophical, not mathematical, in character. Sympathetically inclined to the logistic programme of deducing mathematics from logic, he yet does not participate in it; except for a detailed and somewhat severe criticism of Russell's theory of propositional functions, indeed, he scarcely refers to the work of logicians junior to J. N. Keynes – whose renovated traditional logic he absorbed into his own work.

He begins, we have already pointed out, from the proposition. At the same time, his break from Idealist logic is not a wholly

sharp one; the proposition, he writes, 'is only a factor in the concrete act of judgement'. In spite of Johnson's emphasis on the importance of clear distinctions, his various accounts of the relation between judgement and proposition are impossible to bring into consistency; this fact, touching the very heart of his *Logic*, does much to explain why that book does not leave a single impression on his readers. Unlike the Idealists, he concedes a certain autonomy to formal logic, considered as a theory of propositions; at the same time, this autonomy is so hedged with reservations that formal logic is little more than a puppet-kingdom, the real power lying in the hands of epistemology.

Johnson's *Logic*, in consequence, ventures into unexpected fields; it contains, for example, an elaborate analysis of the mind-body relationship. Logic, he argues, as 'an analysis and criticism of thought' cannot ignore probability and induction; any adequate discussion of induction must explore the conceptions of cause and substance; such an exploration, if it is at all serious, must take account of, and resolve, the special problems set by the mind-body relationship. Johnson, in short, follows his argument wherever it leads him; his *Logic* is a contribution to general philosophy, not only to logic in the narrower sense of the word. But it manifests to a notable degree what one thinks of as 'Cambridge' characteristics; his philosophical discussions are clear, analytic, discriminating, but rarely decisive.

At a few points, however, Johnson has been widely influential. His neologisms, as rarely happens, have won wide acceptance: such phrases as 'ostensive definition', such contrasts as those between 'epistemic' and 'constitutive', 'determinates' and 'determinables', 'continuants' and 'occurrents', are now familiar in philosophical literature. Nor does this mean, only, that Johnson was a clever coiner of words; he demonstrated the usefulness of his innovations in sharpening and reshaping philosophical controversies.

He sets out to show, for example, that there is not one process of definition, or one process of induction, but many; if he then gives a name to these newly-discovered species, this is not for merely decorative purposes. Or again he rebukes logicians for carelessness in discriminating logical forms. In particular, he thinks, they have wrongly grouped together, as being of the same

type, such propositions as 'Red is a colour' and 'Plato is a man'; in order to make the distinction they have overlooked he introduces his contrast between 'determinates' and 'determinables'. Whereas 'Plato is a man', so he argues, asserts class-membership, 'Red is a colour' relates, not a member to a class, but a 'determinate' to a 'determinable'. Red, green, yellow are all determinates of the determinable *colour*, just as square, circular, elliptical, are all determinates of the determinable *shape*. What unites a set of determinates is not that – like the members of a class – they agree in some respect, but rather, Johnson suggests, that they differ in a peculiar manner. Determinates of the same determinable 'exclude' one another, in the special sense that they cannot simultaneously characterize the same area; the one area can be both red and circular, but cannot be both red and green. Furthermore, he argues, their differences are 'comparable', as differences between determinates of different determinables are not. One can sensibly assert, he means, that the difference between red and green is greater than the difference between red and orange, but not that it is greater than, less than, or equal to, the difference between red and circular.

Johnson's talents, it will be obvious, lay particularly in his capacity for making careful distinctions. Recalling also his mathematical powers, one is not surprised to find that he was attracted towards the theory of probability where, if anywhere, careful analysis of problems on the borderland between mathematics, formal logic, and epistemology can reap a rich harvest. His writings on probability, however, are fragmentary and not altogether coherent; they were not published until eleven years after another Cambridge man, J. M. Keynes,[2] had completed *A Treatise on Probability* (1921) which in part incorporated Johnson's teachings, in part went beyond them in ways which Johnson did not quite know how to estimate.

Keynes' indebtedness to Johnson – whom he knew first as a close friend of his father, J. N. Keynes, later as a teacher, and then as a colleague – is sometimes supposed to consist merely in the fact that Keynes took over certain of Johnson's theorems. In fact, however, the spirit of the philosophical parts of the *Treatise* is certainly Johnson's.[3] In his introduction Keynes coupled Johnson's name with those of Moore and Russell, as philosophers

who 'are united in a preference for what is matter of fact, and have conceived their subject as a branch rather of science than of creative imagination, prose writers, hoping to be understood'. Moore had said in his *Principia Ethica* that good is indefinable: Keynes was emboldened to say the same of probability. Russell had deduced arithmetic from logic; Keynes set out to do the same for probability theory. But the peculiarly epistemologico-logical atmosphere of the *Treatise* may fairly be regarded as deriving from Johnson.

In Johnson's manner, Keynes begins from the proposition, not, as Venn had done, from a 'happening' or an 'event'. On Venn's version of the 'frequency' theory, the statement 'the next ball from the urn will probably be black' is an assertion about the percentage of draws from the urn in which a black ball appears; for Keynes, on the other hand, the problem is to ascribe a probability to the proposition 'the next ball will be black'. Unless probability theory is prepared to surrender all claims to be useful in everyday determinations of probability, Keynes argues, it must extend its interest into areas where the frequency theory, which looks plausible enough in the case of ball-drawing, would be obviously inapplicable.

To assign a degree of probability to a proposition, on Keynes' theory, is to relate it to a body of knowledge. Probability is not a property of the proposition-in-itself; it expresses the degree to which it would be rational, on the evidence at our disposal, to regard the proposition as true. Thus probability is always relative; it is nevertheless 'objective', in the sense that a proposition *has* a certain probability relative to the evidence, whether or not we recognize that probability. What precisely, we may ask, is this relation of 'making probable' which holds between evidence and conclusion? A unique logical relation, Keynes answers, not reducible to any other; we apprehend it intuitively, as we apprehend implication.

Unlike implication, however, the probability relation admits of degrees. On given evidence, one conclusion may be 'more probable' than another. Recognizing this fact, some probability-theorists have jumped to the conclusion that probabilities must always be quantitatively comparable. Once again, Keynes thinks, they have generalized from a quite untypical case – the case where,

as in drawing balls from an urn which contains none but black or white balls, the alternatives are exclusive, equiprobable and exhaustive. Then, no doubt, probability can be numerically estimated; but if we look at the matter more broadly, Keynes thinks, we soon see that even comparisons of order, let alone precise quantitative formulations, are often completely out of the question. Consider the relation between sets of experiments and a generalization: suppose that in *Case A* the experiments are more numerous, in *Case B* more varied, and in *Case C* the generalization is wider in scope. In terms of what units, Keynes asks, are we to compare the probabilities of the generalization in relation to these different sets of evidence?

On Keynes' theory of probability, there is a close connexion between probability and induction. To say that a proposition has been arrived at by a 'justifiable induction' is, he thinks, identical with saying that it is 'highly probable'. The classical problem – how is induction to be justified? – thus turns into another: when are we entitled to assert that a generalization is highly probable? Keynes tries to show that any such conclusion depends upon a general postulate, which he calls the Principle of Limited Variety – a revised version of Mill's 'Uniformity of Nature'. 'We can justify the method of perfect analogy,' he writes, 'and other inductive methods so far as they can be made to approximate to this, by means of the assumption that the objects in the field, over which our generalizations extend, do not have an infinite number of independent qualities; that, in other words, their characteristics, however numerous, cohere together in groups in invariable connexions, which are finite in number.'

In other words, induction is justified because the qualities of things carry other qualities with them. Whether this principle is more effective than Mill's in 'saving induction', Keynes' successors gravely doubted.

Of other Cambridge philosophers who took a lively interest in the processes of scientific thinking one of the best known is that modest but voluminous writer, C. D. Broad.[4] Broad, in his *Scientific Thought* (1923), estimates his talents thus: 'If I have any kind of philosophical merit, it is neither the constructive fertility of an Alexander, nor the penetrating critical acumen of a Moore; still less is it that extraordinary combination of both with technical

mathematical skill which characterizes Whitehead and Russell. I can at most claim the humbler (yet useful) power of stating difficult things clearly and not too superficially.' To this can be added what Russell wrote in his review of Broad's *Perception, Physics and Reality* (1914); 'This book does not advance any fundamental novelties of its own, but it appraises, with extraordinary justice and impartiality and discrimination, the arguments which have been advanced by others on the topics with which it deals.' What more is there to say? One cannot describe 'Broad's philosophy' for, as he freely admits, 'there is nothing which answers to that description.' To summarize his clear and meticulous summaries would be to gild the lily. We shall content ourselves, therefore, with an outline of his views about the nature of philosophy, partly to correct a not uncommon misapprehension, partly because this is the easiest way to place him in the context of Cambridge philosophy.

Broad[5] distinguishes between 'critical' and 'speculative' philosophy. Critical philosophy is philosophy in what he takes to be the Moore–Russell manner; its object, according to Broad, is to 'analyse' the basic concepts of science and of everyday life – concepts like *cause*, *quality*, *position* – and to submit to cross-examination the general propositions which the scientist and the ordinary man daily presume, such propositions as 'every event has a cause' or 'Nature is uniform'. Most of Broad's work, then, is analytic in its intention; although, often enough, it is analytic at second remove. It does not so much analyse 'the conception of a material thing' as describe the views which have been, or might be, held about its correct analysis. The final chapter in *Mind and its Place in Nature* (1925), in which Broad distinguishes seventeen possible theories of the mind-matter relation, is the finest flower – or should one say the *reductio ad absurdum*? – of this method.

Yet Broad is not, as some have thought, an enemy of speculation. 'If we do not look at the world synoptically,' he writes, 'we shall have a very narrow view of it'; a purely critical philosophy, he thinks, is arid and rigid. He praises Idealism, because it at least attempts to incorporate within a single theory the findings of art, of science, of religion, of social theory. It is certain types of speculative philosophy, only, which Broad attacks.

Thus, in the first place, those for whom philosophy is by its nature suggestive, metaphorical, poetic, are not likely to regard Broad with sympathetic affection. 'What can be said at all,' he writes, 'can be said simply and clearly in any civilized language or in a suitable system of symbols.' Secondly, he will not allow that speculative philosophy can ever aspire to the heights of strict demonstration. By its nature, he thinks, it must be tentative, fluid, ready to adjust itself to new findings in science, new paths in art, new experiments in social life. It cannot determine *a priori* what is the case; its materials come to it from outside.

Then, thirdly, a sound speculative philosophy must always rest, Broad thinks, upon a foundation of critical philosophy; the speculative philosopher who is content to take over uncriticized whatever anyone cares to affirm is at the mercy of fantasies. Broad's own work is meant as a propaedeutic to, not as a substitute for, speculative philosophy – and to a certain degree it is itself speculative. *Scientific Thought* is an attempt to clarify some of the concepts used in the natural sciences; at the same time it might be described as an attempt to combine into a single theory whatever is viable in physics, in epistemology, and in commonsense. *Mind and its Place in Nature* undertakes an analysis of psychological concepts; yet in so far as it attempts to 'place' mind within Nature, it passes beyond criticism to speculation. (Broad defends a species of 'emergent materialism'.) Indeed, we begin to wonder whether the distinction between analysis and speculation can be as sharp as Broad at first suggests.

Many of Broad's readers were shocked because, in *Mind and its Place in Nature*, he took seriously and discussed in detail the findings of psychical research; this, they felt, is not the sort of conduct to be expected from a Cambridge philosopher. Broad's defence in his essay on 'Psychical Research and Philosophy'[6] throws considerable light on his approach to philosophy.

First of all, he condemns unsparingly those for whom 'philosophy consists in accepting without question, and then attempting to analyse, the beliefs that are common to contemporary plain men in Europe and North America, i.e. roughly, the beliefs which such persons imbibe uncritically in their nurseries and have never found any reason to doubt'. As he wrote elsewhere, 'it is now abundantly evident that little can be done for commonsense'.

Analysis thus understood is, he thought, 'a trivial academic exercise'. In this respect, he stands close to Russell, and at the remotest pole from Moore. His starting-point is science, rather than commonsense; if there is a conflict, commonsense must give way. He seeks to imitate, all the same, Moore's meticulousness rather than Russell's audacity. Once he lamented thus: 'si Moore savait, si Russell pouvait'; this may be read as nominating his ideal – Russell's knowledge conjoined with Moore's analytic powers.

Commonsense, then, has no rights against the findings of psychical research; nor can an *a priori* metaphysics rule out ghosts, if only for the very good reason that there is no such metaphysics. Psychical research, he concludes, must be left to speak for itself, subject of course to the control of critical philosophy. This is Broad's characteristic attitude.

Of all metaphysicians, Broad most admires McTaggart, for all that McTaggart attempted the impossible, the construction of a deductive metaphysics. Broad devoted several years of his life to the writing of his vast three-volumed *Examination of McTaggart's Philosophy* (1933–8), a book which as well as commentary contains many striking examples of Broad's own philosophical work. Two things delighted Broad in McTaggart: his coolness and his clarity. No metaphysician has been less dithyrambic, none has made so desperate an effort to be clear. For once, Broad remarks, 'definite premises are stated in plain language and definite conclusions are drawn from them by arguments we can all follow and accept or reject'. That Broad considered McTaggart to be worthy of so extensive an examination is further evidence at once of his sympathy with speculation and of the special character of that sympathy.

'I shall watch with a fatherly eye,' Broad wrote in the Preface to *The Mind and its Place in Nature*, 'the philosophical gambols of my younger friends as they dance to the highly syncopated pipings of Herr Wittgenstein's flute.' That was in 1925, and Wittgenstein's *Tractatus Logico-Philosophicus* had first appeared in English[7] three years previously (the German version was published in 1921). Broad's comment, then, bears witness to the immediate impact of the *Tractatus* upon certain of the younger philosophers at Cambridge, for all that it was by no means widely read in England until the late nineteen-thirties, and was not

until the nineteen-sixties made the subject of detailed criticism and commentary.

It is a book, indeed, which one sets out to describe with more than ordinary diffidence.[8] Partly this is a consequence of the enthusiasm Wittgenstein inspired in his pupils. If there is now nobody, if indeed there never has been anybody, who would subscribe to all the leading doctrines of the *Tractatus* – Wittgenstein, as we shall see later, came to criticize it severely – there is still in many quarters a reluctance to believe that Wittgenstein could have been mistaken in ways that were not somehow wiser, more penetrating, than the mistakes of his contemporaries. Again, delicate questions of discipleship are involved: the question, 'What did Wittgenstein mean?' is closely linked with another, 'Who can truly claim to be carrying on his work?' On the other side, there are still those who would dismiss Wittgenstein as a charlatan. It will be apparent that no account of the *Tractatus* is likely to win universal acceptance.

Apart from these extrinsic difficulties, which the chronicler must learn to regard with relative equanimity as the perils incident to his profession, the *Tractatus* itself is sufficiently intimidating. It discusses questions of a peculiarly intricate kind – meaning, the nature of logic, facts and propositions, the task of philosophy – in a manner which disconcertingly combines the Romantic, not to say apocalyptic, and the precisely formal.

The preface at once displays these two streaks. The opening sentence – 'this book will perhaps only be understood by those who have themselves already thought the thoughts which are expressed in it, or similar thoughts' – is in the best tradition of Romanticism, in so far as it suggests that only a chosen few, sympathetic souls, will *really* understand. Yet Wittgenstein goes on to tell us that the 'whole meaning' of the *Tractatus* can be summed up as follows: 'what can be said at all can be said clearly; and whereof one cannot speak thereof one must be silent.' Here at once the central paradox of the *Tractatus* leaps to the eye; it tells us what, it says, cannot be said, and tells us obscurely, in metaphor and epigram, that what can be said at all can be said clearly. The very form of the *Tractatus* reflects this paradox. Each paragraph is numbered in accordance with an elaborate system, as if now at last we were dealing with a philosopher who would

aid our comprehension in every possible way. Yet the paragraphs thus numbered are composed in a style so enigmatic, with sentence-links so tenuous, that scarcely one of them does not raise serious problems of interpretation.

An elucidation of the *Tractatus*, then – even supposing that I felt competent to undertake it – would need to be lengthy and minute. All that I can hope to do, within limits at all reasonable, is to select for slight consideration those points at which the *Tractatus* has, so far, been mainly influential.

Something should first be said about the intellectual background of the *Tractatus*. Wittgenstein was trained as an engineer, not as a philosopher, so that one cannot presume in him an ordinary acquaintance with academic philosophy. Like many another amateur, he was interested in Schopenhauer; if there is sometimes a Kantian flavour in his work, that is perhaps the explanation. He knew something of Mach and Hertz, and perhaps he had dipped into, or heard somebody discuss, Meinong and Husserl. All one can say with confidence is that in writing the *Tractatus* Wittgenstein was taking as a point of departure some of the things he had read in the works of, or picked up in discussion with, Frege and Russell. Quite what he owed to, and quite what he contributed to, Russell's 'philosophy of logical atomism' it is difficult to say. He nowhere refers to any of his predecessors except in an elusive and off-hand fashion; what he says even about Frege and Russell is sometimes very puzzling. In short, this is not a case in which the detailed pursuit of influences is likely to prove at all rewarding.

Now for the *Tractatus* itself. It begins with a series of staccato pronouncements: 'The world is everything that is the case. The world is the totality of facts, not of things . . .' Yet this, it is fairly clear, is not the real beginning. Wittgenstein has ordered the paragraphs of the *Tractatus* in what he judges to be the most artistic, the most striking, sequence; if we hope to understand *why* he says what he does, we have to move backwards and forwards through their serried array. His real starting-point is a theory of meaning, not a directly-intuited ontology.

Wittgenstein's crucial assumption is that every proposition has a clear and definite sense; and conjoined with that, the assumption that this sense lies in the proposition's relation to the

'world'. Now the propositions of everyday life contain complex expressions, expressions which are certainly not what Russell called 'logically proper names'. Such complex expressions can always be replaced by descriptions. If, for example, somebody asks us what it means to say that 'all millionaires are stubborn', we can answer by substituting descriptions for 'millionaires' and 'stubborn', by saying, for example, 'all persons who possess more than a million pounds are difficult to persuade'. But by offering this sort of elucidation, we have still not made the sense perfectly 'clear and definite' in Wittgenstein's sense of that phrase; we could sensibly be asked to substitute further descriptions for the complex expressions in our new assertion. To arrive at a determinate sense for the proposition – to give the 'one and only complete analysis of the proposition' – we must, according to Wittgenstein, define the complex sign by means of (logically proper) names. 'It is obvious,' he writes, 'that in the analysis of propositions we must come to elementary propositions, which consist of names in immediate combination.' At that point we can no longer ask that the sense be made clearer to us; a name cannot be defined. Nor do we *need* to make this request, for a proposition containing no expressions except names points immediately to the world – its sense is given directly to us as the combination of simple entities to which it refers.

There must be simple entities, then – what Wittgenstein called 'objects'[9] – because there are names; and there must be names because propositions have a definite sense. Wittgenstein was not interested in nominating examples of simples. The point, for him, is that there *must be* simples; *what* they are is a matter of secondary importance. 'Even if the world is infinitely complex,' he writes, 'so that every fact consists of an infinite number of atomic facts and every atomic fact is composed of an infinite number of objects, even then there must be objects and atomic facts.' This is much more in the spirit of Leibniz than of Hume.

Names, Wittgenstein argues, have no sense except in the context of a proposition; correspondingly, we cannot think of an object except as having various possible connexions with other objects; such possible connexions between objects are 'atomic facts'. This sounds very strange – to call *possible* connexions 'facts'. We ordinarily think of a fact as actual, by its very nature.

Yet it is difficult to find any other translation for the German 'Sachverhalt'. The strangeness diminishes slightly if we think of an atomic fact as 'that which makes a proposition true or false'. A proposition is true if certain atomic facts 'exist', false if they 'do not exist': the atomic facts must, then, be of such a kind that the question whether they 'exist' or 'do not exist' ('obtain' or 'do not obtain') can always be raised. Atomic facts are realized possibilities if the proposition which pictures them is true, unrealized possibilities if it is false, but their 'existence' as possibilities is unaffected by the question whether they are realized or not, by the question, that is, whether they are 'facts' in the harder sense of that word. In studying logic, according to Wittgenstein, we are not really interested in the hardness of facts: 'all possibilities are its facts.' This is inevitably so, he thinks, because false propositions – propositions which assert possibilities which are not realized – are as much part of the field dealt with by logic, as much capable of being asserted and denied, of implying or not implying, as true propositions.

How exactly are propositions related to facts? Wittgenstein's answer is that they are 'pictures' of the fact. Various anecdotes are told about the circumstances in which this view first occurred to him, anecdotes which agree in one respect: he was impressed by a model which had been constructed to illustrate some calamity, let us say a motor accident. 'There,' he thought as he looked at the miniature cars, the miniature road, the miniature hedges, 'is a proposition.'

The problem, as Wittgenstein saw it, was to give an account of the proposition which will allow, first, that we are free to construct false propositions as well as true ones, and secondly, that the point of a proposition lies in its relation to the world. The 'picture' analogy seemed to be satisfactory in both respects. Obviously, by means of miniature motor-cars we can give a false picture of what actually happened; obviously again, the point of our manipulations with the motor-cars is to 'convey something about the world'.

The motor-cars, of course, are not in themselves a proposition; we could use them in a game as well as to picture an accident. Only when they are arranged in a certain way do they convey what has happened. Thus arranged, according to Wittgenstein,

they are a 'propositional sign'; the 'proposition' is such a sign 'projected on the world', i.e. used to affirm or deny that something is the case. But what about the case – the normal case – where the propositional sign consists of words? Wittgenstein admits that such a proposition is not, superficially, the sort of thing we should ordinarily describe as a 'picture'. Even although, however, our ordinary language is no longer hieroglyphic, it has kept, he thinks, what is essential in hieroglyphic writing. It retains its power of conveying to us what it represents, even although we have never actually observed what is thus conveyed – and indeed in that case where the proposition is false, we could not possibly have observed what it conveys. This power of conveying depends, he maintains, on the fact that the proposition has precisely the same structure as what it represents. 'One name stands for one thing,' he writes, 'and another for another thing, and they are connected together; in this way, the whole, like a *tableau vivant*, presents the atomic fact ... in the proposition there must be as many things distinguishable as there are in the state of affairs which it represents.'[10]

One objection which naturally occurs to us is that this theory could apply, at most, to elementary propositions. Ordinary propositions do not picture atomic facts: they contain such expressions as 'all', 'some', 'or', 'not', none of which can have any analogue in an atomic fact. For in calling such facts 'atomic' what Wittgenstein means above all is that they are logically independent; from the 'existence' of an atomic fact, nothing whatever follows about the 'existence' or the 'non-existence' of any other atomic fact. Thus there can be no negative atomic facts – let alone universal atomic facts – since the 'existence' of *X is not Y* is not logically independent of the 'non-existence' of *X is Y*.

'My fundamental thought,' Wittgenstein therefore wrote, 'is that the "logical constants" do not represent.' Although they occur within propositions, he means, logical constants are not one of the elements in the picture. He discusses in considerable detail the crucial case of 'not'. It is obvious, he thinks, that 'not' is not the name of a relation, in the sense that 'right' and 'left' name relations. Indeed, 'not' cannot be a name at all; if it were, 'not-not-*p*' would be a quite different assertion from '*p*', as naming

two *nots* which '*p*' does not mention. Then – a conclusion he regards as ridiculous – from the single fact that *p*, an infinite number of other facts could be made to follow, by the process of adding double-negations. 'Not', then, is no name; it does not refer to an object. What it does is to indicate – and the same is true of all the other logical constants – that an operation has been performed upon '*p*', in this case the operation of denial.

As a result of his consideration of the role played by 'logical constants' in propositions, Wittgenstein is led to conclude that every non-elementary proposition is a 'truth-function' of elementary propositions. In his paper* 'Some Remarks on Logical Form' (*PASS*, 1929) he puts the matter thus: 'If we try to analyse any given propositions we shall find in general that they are logical sums, products or other truth-functions of simpler propositions. But our analysis, if carried far enough, must come to the point where it reaches propositional forms which are not themselves composed of simpler propositional forms. We must eventually reach the ultimate connexion of the terms, the immediate connexion which cannot be broken without destroying the propositional form as such. The propositions which represent this ultimate connexion I call, after Russell, atomic propositions. They, then, are the kernels of every proposition, *they* contain the material, and all the rest is only a development of this material.'

Suppose we consider the proposition *p or q*. Then the word 'or' does not represent 'an ultimate connexion'; as comes out in the fact that the sense of *p or q* can be wholly given by referring to its 'truth-grounds', in which 'or' plays no part. It will be true if *p* and *q* are both true, true if *p* is true and *q* is false, true if *p* is false and *q* is true, false if *p* is false and *q* is false. Set out these results in a diagram – a 'truth-table' – and the result is a propositional sign which clearly pictures the sense of *p or q*.[11] Every non-elementary proposition can be analysed by this method, according to Wittgenstein, even when – although this presents special difficulties – it contains the universal quantifier 'all'. This result can be alternatively expressed by saying that all propositions

*Wittgenstein was so dissatisfied with this paper, his only publication after the *Tractatus*, that he refused either to read or discuss it when the time came for its delivery. But I do not think he was then dissatisfied with the passage I have quoted.

have the same general form: that of a selection out of the range of atomic facts, a selection made by negating certain combinations.

There are two extreme cases in such a selection: the case where no combination whatever is ruled out, and the case where every combination is ruled out. Thus suppose we substitute *not-p* for the *q* in *p or q*, then the resulting expression *p or not-p* is true for all possibilities: the only possibility ruled out by *p or q* is the case where *p* and *q* are both false, and this case cannot occur when *q* is replaced by *not-p*. An expression such as *p or not-p* Wittgenstein calls a 'tautology'; *p and not-p*, which allows no possibilities, he calls a 'contradiction'. Tautologies and contradictions are 'without sense' because they do not picture the world. 'I know nothing about the weather,' Wittgenstein writes, 'when I know that it is either raining or not raining.' Yet they are not useless; they form 'part of the symbolism'.

All the truths of logic, indeed, are classed by Wittgenstein with 'tautologies'. This follows directly from the truth-functional analysis. Take, for example, the logical truth that *p or q* together with *not-p* implies *q*. Set out the truth-grounds for *p or q* and the truth-grounds for *not-p* and we shall be able to read off immediately that *p or q* and *not-p* cannot both be true except in the case where *q* is true. This fact can be alternatively expressed, on Wittgenstein's theory of 'sense', by saying that the sense of *q* is included in the sense of (*p or q*) *and not-p*. In an adequate symbolism – in an ideal language – this, according to Wittgenstein, would be immediately obvious. We are not, then, saying something about the world when we assert that *p or q* and *not-p* together imply *q*; in making this assertion we are not excluding some genuine possibility. All we are doing, according to Wittgenstein, is drawing attention to a feature of our symbolism, something the symbolism itself should show. 'It is a characteristic mark of logical propositions,' he writes, 'that we can perceive in the symbol itself that they are true.'

If logic consists wholly of tautologies, we might ask, why do we find it necessary to construct proofs of the propositions of logic? A 'proof', Wittgenstein answers, is nothing but a mechanical expedient for recognizing tautologies more rapidly; the view that there are 'primitive propositions' of logic from which all the

other propositions of logic ought to be deduced is a delusion. All the propositions of logic, he argues, stand on exactly the same footing; they all say the same thing, i.e. nothing at all.

What of mathematics? That consists, Wittgenstein argues, of equations; from which it follows directly that the propositions of mathematics, too, are without sense. For it is always nonsense, he maintains, to say of two distinct things that they are identical; and to say of one thing that it is identical with itself is to say nothing. Mathematics says, what in its symbolism we can see, that certain expressions can be substituted for one another; that this can be done *shows* us something about the world but does not *picture* the world. Thus the propositions of mathematics are 'senseless'.

Senseless, but not nonsensical; on the other hand, Wittgenstein argues, the metaphysician talks nonsense, in the fullest sense of the word. There is no novelty in this accusation: as we have already seen, it formed part of the regular stock-in-trade of nineteenth-century positivism, to trace it no further back. What was novel, however, was the accusation that metaphysics arises out of the fact that philosophers do not understand 'the logic of our language'.

In the most obvious case, the philosopher is misled, according to Wittgenstein, by the fact that the grammatical form of our propositions does not always reflect their logical form. Merely because 'millionaires are non-existent' resembles in grammatical form 'millionaires are non-cooperative', the philosopher is led to suppose that 'non-existent' is a quality, and is then well embarked upon a metaphysical inquiry into 'the nature of non-existence'. In a perfect language, one in which every sign immediately indicated its logical function, such misunderstandings, Wittgenstein thinks, would vanish; what we now write as 'millionaires are non-existent' would be so expressed that 'non-existent' would no longer look like a predicate. Such a language, we might say, would make logic unnecessary and metaphysics impossible.

In other instances, Wittgenstein thinks, metaphysics arises out of the attempt to pass beyond the boundaries of language – by talking, as we have been doing, about the relations between language and the world. No proposition, Wittgenstein maintains,

can represent what it has in common with the world – that form in virtue of which it is an accurate picture. To do this, it would have to include within itself a portion of the world in a non-pictured form – so as to be able to make the comparison between the world and the picture. But this, according to Wittgenstein, is impossible; to talk about the world is at once to picture it. To suppose otherwise is to imagine that we can somehow say what lies beyond language, i.e. beyond anything that can be said.

What, then, *can* the philosopher say? Wittgenstein's answer is uncompromising – 'nothing at all!' 'The right method of philosophy,' he tells us, 'would be this: to say nothing except what can be said, i.e. the propositions of natural science, i.e. something that has nothing to do with philosophy: and then, always, when someone else wishes to say something metaphysical, to demonstrate to him that he had given no meaning to certain signs in his propositions.' Philosophy, on this view, is not a theory but an activity: the activity of making clear to people what they can, and what they cannot, say.

By way of reply, we might be tempted to assert that there are at least *some* non-metaphysical, sensible, philosophical assertions, namely those which arise out of the analysis of scientific method. This Wittgenstein denies. Such propositions, he says, are either propositions about the psychology of human beings or else turn out, on analysis, to be propositions of logic, propositions which 'belong to the symbolism'. Of the first type, the most important example is 'the so-called law of induction'. Induction, as defined by Wittgenstein, is 'the process of assuming the *simplest* law that can be made to harmonize with our experience'; and, he argues, 'there are no grounds for believing that the simplest course of events will really happen'. It is 'only a hypothesis,' he says, that the sun will rise tomorrow; we do not know that it will rise. We should only *know* it will rise if this were a *logically necessary* consequence of our experience; there is no sort of necessity, he presumes, except logical necessity, no sort of inference except 'logical' (i.e. tautological) inference. 'In no way,' he writes, 'can an inference be made from the existence of one state of affairs to the existence of another entirely different from it . . . superstition is the belief in the causal nexus.' It follows that 'the law of induction' is certainly not a proposition of logic; on Wittgenstein's

view it says merely – and so it is a proposition of psychology, not of philosophy – that human beings ordinarily prefer simpler to more complex explanations.

As for the law of causality, that, according to Wittgenstein, is a proposition of logic in disguise – an attempt to say what can only be shown in our symbolism, that 'there are natural laws'. We do not discover that there are uniformities, he argues, by inspecting the world around us; these uniformities already show themselves in our talk about the world, in the mere fact, indeed, that we are able to think. Similarly, what Hertz picked out as the *a priori* laws of mechanics are simply descriptions of our symbolism, descriptions which our symbolism itself ought to 'show'. If we think of science as an attempt to describe the world by means of a fine mesh, *a priori* laws, Wittgenstein says, are not part of the results at which we thus arrive: on the contrary they are the characteristics of the mesh (although it *shows* us something about the world, Wittgenstein thinks, that it can be described in such-and-such laws).[12] So, Wittgenstein argues, his general conclusion remains – all propositions which picture the world belong to the natural sciences, and those which do not picture the world, if they are not nonsense, are tautological. Nowhere is there any room for a peculiar class of philosophical propositions. This was certainly a disconcerting conclusion.

Of those Cambridge men who were immediately influenced by the *Tractatus*, the most remarkable was F. P. Ramsey. Ramsey died at the age of twenty-six, and the few years of his mature life were divided between economics, mathematical logic and philosophy; nor was he one of those who light in early life upon a system to which they are thereafter faithful. Thus he wrote no major work, and the essays and fragments collected for posthumous publication by R. B. Braithwaite as *The Foundations of Mathematics* (1931) represent different stages in the development of a mind rather than varied aspects of a single point of view. They have been none the less influential for that.

In the essay (1925) which gave its title to *The Foundations of Mathematics* Ramsey takes his stand with the logistics of Whitehead and Russell against Hilbert and Brouwer; but at once displays his independence. In opposition to Wittgenstein, he maintains that the propositions of mathematics are tautologies,

not equations, and is thus enabled still to uphold the doctrine that mathematics is deducible from logic; at the same time, of course, it was from Wittgenstein that he learnt to think of logic as being composed of tautologies. His general object is to show, with the help of Wittgenstein's truth-functional analysis of general propositions, that it is possible to derive mathematics from a logic which contains no empirical propositions, no propositions like the Axiom of Reducibility or the Axiom of Infinity, and yet which does not collapse into paradox.* In attempting to continue, with aid from the *Tractatus*, the sort of inquiry which Whitehead and Russell had initiated, Ramsey was almost unique amongst British philosophers of the between-wars period. For the most part, philosophers – whose other interests are usually literary, historical, or linguistic, rather than mathematical – when faced with the formidable symbolism of *Principia Mathematica* decided that formal logic was no longer for them; they retreated into the more congenial territory of epistemology.

Ramsey moved in the same direction, partly under the influence, it would seem, of Johnson, partly because he had now read Peirce, partly following in Russell's footsteps. Thus the final conclusion of his 'Facts and Propositions' (1927), although he largely derives his logical apparatus from Wittgenstein, is pragmatic in tendency. One can see this most clearly in his analysis of negation: he agrees with Wittgenstein that *not-not-p* is the same proposition as *p*, and hence that 'not' is not a name, but he is unwilling to leave the matter at this point. The word 'not', he argues, expresses a difference in feeling, the difference between asserting and denying. It will follow that 'disbelieving *p*' is identical with 'believing *not-p*': and this conclusion Ramsey tries to justify in a typically pragmatic manner, by identifying the causes and the consequences of these two apparently different attitudes of mind.

Similarly, in his 'Truth and Probability' (1926) he rejects Wittgenstein's doctrine that we 'have no grounds' for inferences which are not tautological. Induction he describes, after Peirce,

*See, for the details, Ch. 9 above. He later had qualms about the possibility of 'saving' the whole of pure mathematics by a logic which contains no empirical propositions; so much the worse for pure mathematics, he seems to have concluded.

as a 'habit of the human mind', one which cannot, he admits, be justified by any purely formal methods – not even, as Keynes had thought, by the theory of probability – but which it is none the less 'unreasonable' not to adopt. A logic of induction, a 'human logic', will describe, he concludes, the degree of success with which inquirers employ different methods of arriving at the truth. Induction, he thinks, is pragmatically justified; and this is a rational justification, not, as Wittgenstein had argued, a mere matter of psychology.

The same movement towards pragmatism can be discerned in 'General Propositions and Causality' (1929). Ramsey now rejects the view, which he had previously taken over from Wittgenstein, that a general proposition is a conjunction of atomic propositions, although a conjunction with the peculiar property that we cannot, for lack of symbolic power, enumerate its constituents. (On which Ramsey comments: 'But what we can't say we can't say, and we can't whistle it either.') At the same time, he is still convinced that all propositions are truth-functions; the conclusion he draws is that general propositions are not, properly speaking, 'propositions'. We ought not to distinguish them, he argued, into the true and the false, but rather into those which it is 'right' or 'wrong', 'reasonable' or 'unreasonable', to maintain. They are ways of meeting the future: to say that 'all men are mortal', on this view, is to announce that any man we meet we shall regard as mortal. People may try to wean us from this way of regarding men, they may condemn it as unreasonable. But it cannot be proved to be false, Ramsey thinks, just because it makes no definite statement about the properties of objects.

As opposed to Wittgenstein, again, Ramsey considers that philosophy issues in a particular class of propositions – elucidations, classifications, definitions, or, at least, descriptions of the way in which a term *could* be defined. The difficulty for philosophy, he thinks, is that its elucidations involve one another; we cannot, for example, begin our elucidation by presuming that the nature of meaning is completely clear and then go on to use meaning to elucidate space and time, because to clarify the nature of meaning we must already have attained to some understanding of space and of time. The great danger of an elucidatory philosophy, Ramsey says, is scholasticism – 'the essence of which is

treating what is vague as if it were precise and trying to put it into an exact logical category'. With that remark, however, we have crossed the border between the older and the newer Cambridge.

For the time being the emphasis was still on clarity. Russell, Moore, Wittgenstein, Broad, Johnson, were all read as making the same point: that philosophy is analysis, clarification. A typical product of the period is the journal *Analysis*, which first appeared in 1933, under the editorship of A. Duncan-Jones, and with the collaboration of L. S. Stebbing, C. A. Mace,[13] and G. Ryle. The object of *Analysis*, so it was laid down, was to publish 'short articles on limited and precisely defined philosophical questions about the elucidation of known facts, instead of long, very general and abstract metaphysical speculations about possible facts or about the world as a whole'. This was clearly a reformulation of Russell's demand for 'piece-meal investigations', as represented in practice rather by Moore's philosophical articles than by Russell's books. When the then editor of *Analysis*, Margaret Macdonald, published a selection of articles from *Analysis* as *Philosophy and Analysis* (1954) she chose her epigraph, however, from the *Tractatus*, not from the work of Moore or of Russell: 'The object of philosophy is the logical clarification of thoughts. ... The result of philosophy is not a number of "philosophical propositions" but to make propositions clear.' Wittgenstein was preaching, it was thought, what Moore had practised: the *Tractatus* was read as a sort of analyst's handbook.

Naturally, however, certain difficulties arose out of this conflation of Russell, Moore and Wittgenstein. What exactly, it was asked, does analysis analyse – a sentence, a proposition, a concept, or a word? More important still, what does it analyse them into? These questions were much discussed;[14] analytic methods, it is fair to say, were more freely employed in the analysis of analysis than in the analysis of anything else.

The variations through which this discussion moved can be illustrated in the work of L. S. Stebbing.[15] Her 'The Method of Analysis in Philosophy' (*PAS*, 1931) begins from a distinction between the 'immediate reference' of a proposition – what we all understand when we hear it uttered – and its 'exact reference', which includes everything which must be the case if the proposition is true. The 'immediate reference' of the proposition 'All

economists are fallible', for example, does not include the fallibility of Keynes; we can understand this proposition without ever having heard of Keynes. But the fallibility of Keynes forms part of its 'exact reference', Stebbing says, since if the proposition is true Keynes must be fallible.

Metaphysical analysis, according to Stebbing, works with two assumptions; first that we understand quite well, at the level of immediate reference, quite a variety of propositions, secondly, that such propositions make 'exact reference' to basic propositions, ultimate sets of elements, the ultimacy of which consists in the fact that their immediate reference and their exact reference are identical. Obviously, she has in mind Moore's doctrine that 'we all know quite well' that hens lay eggs, but differ about the 'ultimate analysis' of this proposition; at the same time, her 'set of elements' is, she says, identical with Wittgenstein's 'combination of elements' or 'atomic facts'. Thus, on her interpretation, Moore and the *Tractatus* are saying much the same thing: that philosophical analysis consists in unveiling those basic propositions to which an everyday proposition ultimately refers.

Fairly clearly, however, not all 'analysis' satisfies this definition. In her 'Logical Positivism and Analysis' (*PBA*, 1933) Stebbing distinguishes, therefore, between four different kinds of analysis. First, there is the analysis of sentences with the object of clarifying their logical form, the sort of analysis typified in Russell's theory of descriptions; secondly, the analysis of a concept, illustrated in Einstein's analysis of simultaneity; thirdly, the mathematician's 'postulational analysis', the definition of terms by analytic methods; and then fourthly, the sort of analysis, now christened 'directional analysis', she had described in 'The Method of Analysis in Philosophy'. That, she thought, is the peculiarly philosophical sort of analysis – in opposition, say, to Ramsey for whom Russell's theory of descriptions was the 'paradigm of philosophy'.

By the time Stebbing came to write her essay on 'Moore's Influence' for *The Philosophy of G. E. Moore* (1942), she had begun to feel suspicious of the metaphysics which is presumed by directional analysis. It now seemed to her that there are no 'basic facts'; the doctrine of basic facts, she suggests, is a relic of the days when philosophers thought they had to justify the beliefs

of commonsense by setting them on a solid 'ultimate' foundation. The important sort of analysis, she came to think, is 'same-level' analysis, in which expressions are defined by expressions and concepts are defined by concepts – an analysis which makes no metaphysical assumptions. In thus reacting against 'directional analysis' Stebbing reflects the general tendency of the 'thirties.

The earlier writings of John Wisdom may serve as a second example of the analytic controversy. In his 'Is Analysis a Useful Method in Philosophy?' (*PASS*, 1931), he distinguishes three sorts of analysis: material, formal and philosophical. Russell's theory of descriptions is 'formal' analysis; the ordinary definitions of science are examples of 'material' analysis. Both of these are 'same-level'; philosophical analysis, in contrast, is 'new-level', replacing the less by the more ultimate. He explains, by the use of examples, what he means by 'more ultimate'. 'Individuals', he says, 'are more ultimate than nations. Sense-data and mental states are in their turn more ultimate than individuals.' It turns out, then, that philosophical analysis consists in trying to show how statements about minds can be reduced to statements about mental states, and statements about material objects to statements about sense-data: in short, it is the practice of what a foreign observer has described as 'the favourite English parlour-game' – reductive epistemology. Wisdom wrote an elementary textbook *Problems of Mind and Matter* (1934) in order to illustrate the usefulness of analytic methods; there is very little in it which would read strangely to Broad or even to Stout.

The long series of articles on 'Logical Constructions' (*Mind*, 1931–3) is a different matter: these we might describe as the most whole-hearted of all attempts to set out the logical assumptions implicit in 'philosophical analysis'.[16] In what respects, he asks, is an ordinary proposition an unsatisfactory 'picture'? There is a sense, it is obvious, in which 'England declared war on France' is already a perfectly satisfactory picture: we understand that assertion quite well. The analyst has to show that there is another sense in which such a 'picture' is *not* satisfactory. This Wisdom attempts by a vertigo-inducing alternation of small and capital letters. The ordinary sentence 'shows' in so far as it tells us something, but it does not 'Show' us the ultimate logical structure of what it shows; it points to a 'fact', but not to a 'Fact', not that

is, to what is ultimately the case. A similar duplicity is exhibited, he suggests, by all the other words which we would wish to employ in an account of the functioning of propositions. Wisdom's *Logical Construction* articles display an astonishing degree of virtuosity, but their very ingenuity had the effect of persuading philosophers that something had gone wrong somewhere. They mark, indeed, the end of an epoch at Cambridge.

CHAPTER 16

Logical Positivism

In 1895, Mach was appointed to a newly created professorship in the philosophy of the inductive sciences at the University of Vienna, an appointment which was at once a testimony to the strength of the empirical tradition at Vienna and the means by which that tradition was confirmed and strengthened. In 1922 the same chair was offered to Moritz Schlick, who had already made a name for himself as a philosopher-scientist – in particular as an interpreter of Einstein; around Schlick as nucleus 'the Vienna Circle'[1] rapidly took shape. For the most part, its members were scientists or mathematicians, already anti-metaphysical Machians. Except for Schlick himself they knew little about, and cared less for, the classical philosophers. The novel doctrines espoused by Wittgenstein, as the Circle read them in the *Tractatus* or heard them reported by Schlick and Waismann, were a different matter.[2] He, too, was a scientist, an anti-metaphysician, and was worthy, then, to be heard with respect.

Wittgenstein, so the Circle thought, showed empiricists the way out of what had threatened to be an impasse. How, empiricists had anxiously inquired, could the certainty and the 'ideal' character of mathematics be reconciled with the empiricist doctrine that all intelligible propositions are based upon experience? Not many empiricists had the hardihood to argue, with Mill's *Logic*, that the propositions of mathematics are empirical generalizations.[3] If only they could be interpreted, in Wittgenstein's manner, as identities, all would be well.[4] The empiricist need only amend his original thesis slightly: now he would maintain that every intelligible proposition rests upon experience *unless it is an identity*. Since no metaphysician would be prepared to admit that his propositions 'tell us nothing about the world', such an amendment did not seriously impede the empiricist criticism of metaphysics – which is what really interested the Vienna Circle.

'Metaphysics', for the members of the Circle – 'logical positivists' as they came to be called[5] – is the attempt to demon-