INTRODUCTION

Recruits to the army of orthodox Western economic science accept a twin allegiance. They swear a general empiricism in the pursuit of knowledge and, even if they would not always admit to it, a methodological individualism in the attempt to explain human behaviour. As empiricists, they are to reject the rationalist quest for necessity among truths and inevitability among events. As individualists, they are to reject the social definition of man given by medievalists and mercantilists and refurbished by Marx. In economics, the vanguard of advance, they are to work with a notion of abstract individuals, who choose among abstractly described alternatives. In epistemology they are to insist that theories are justified only by their predictive success. Neither allegiance seems to us wise. We shall argue that neo-Classical theories of economics are unsound and that they rely for defence on a Positivist theory of knowledge which is also unsound. Having sought vainly for a trustier branch of empiricism, we shall finally argue the merits of a Rationalist philosophy and a Classical or Marxian Economics.

Our ambitions and apologies

So bold a thesis needs a scholarly defence in several volumes. Each ingredient has a complex history of subtle argument and each has been studied by authorities whom we cannot hope to rival. But, if debate had to wait for a synoptic papal bull, it would never start. Besides, general judgments formed by default can be as influential as those reached by debate and the influence of empiricism, allied in economics with neo-Classical thinking, is beyond doubt. This is not to deny that empiricists and neo-Classicists have their reasons nor that general argument occurs. But we believe that methodology is usually discussed within assumptions which need to be questioned and, indeed, rejected. Lest our point be missed, we have written something of a polemic. While regretting the cost in subtlety and scholarship, we hope for enough gain in clarity to start a fight.

We are also wary of the electrified wire dividing some academic disciplines. Fortunately it is deadliest at the lateral boundaries along the frontier with

ignorance. Further back, where students are taught to intermediate level, there is more interdisciplinary harmony, since standard methods of enquiry and the corpus of existing knowledge yield a united front. The doubts, modifications and limitations peculiar to each discipline are not for beginners. However diffracted the light of truth passing through the prism of the graduate student's thesis, it shines bright and steady from the textbook. It is here that economics and philosophy have joined forces. In economics a few great textbooks have ruled the classroom and tormented every generation of students since the war. These books almost all start with a section on methodology, propounding a Positivist philosophy of science. This is the influential alliance, which we propose to attack.

The crucial issues for an economic theory often arise among the most complex of its implications. Nevertheless we must beg leave to ignore, for instance, the mathematical intricacies of modern neo-Classical theory. We shall not consider the existence or the stability of general equilibrium. Nor shall we worry about its Pareto optimality.[1] We shall not try to unravel the third volume of *Das Kapital* with matrix algebra nor to pin down the Ricardian invariant measure of value nor to expound the mysteries of 'reswitching' and 'capital reversing' in modern Marxian-type models.[2] Instead we shall be concerned with simpler matters. When dealing with neo-Classicism, we shall confine ourselves to consumer behaviour (presented in indifference curves and in simple versions of revealed preference theory) and marginalist producer behaviour in both product and factor markets. Perfect markets will not be the only ones considered, since neo-Classical thinking embraces many varieties and defines a whole system of classification for them. But although our economic questions will thus arise from the textbooks, we believe their implications to be extensive, since we hope to show that death at the roots kills the fruit on the branches.

We cannot so easily, however, base our case for Classical-Marxian thought on textbooks, since relatively few exist and those, for instance in

[1] Those who wish can consult Gerard Debreu, *Theory of Value* (Yale University Press, 1972); J. von Neumann, A model of general economic equilibrium, *Review of Economic Studies*, vol. 13, no. 33 (1945); and T. C. Koopmans, *Three Essays on the State of Economic Science*: *1st Essay* (McGraw-Hill, 1957).

[2] Cf. F. Seton, The 'transformation problem', *Review of Economic Studies*, vol. 24, no. 65 (June 1957); F. Seton and M. Morishima, Aggregation in Leontief matrices and the labour theory of value, *Econometrica*, vol. 29, no. 2 (April 1961); P. Sraffa, *Production of Commodities by Means of Commodities* (Cambridge University Press, 1960); L. Pasinetti, A mathematical formulation of the Ricardian system, *Review of Economic Studies*, vol. 27(2), no. 73 (February 1960); P. A. Samuelson, Understanding the Marxian notion of exploitation, *Journal of Economic Literature*, vol. 9, no. 2 (June 1971).

Socialist countries, are often primarily concerned with other questions.[3] Instead, we shall rely on the classic writings of Ricardo and Marx and on the modern work of Piero Sraffa and Joan Robinson. Our economic analysis will be confined to the simplest and most general propositions.

Our economic quarrel with neo-Classicism is, firstly, that it concentrates on *market* interdependence, neglecting the deeper technological interdependence, which turns out to limit the possibilities of substitution compatible with the assumed 'givens'; secondly, that it ignores institutional and especially class relationships, so misrepresenting the nature of payments to 'factors' and neglecting the economic significance of power and conflict in societies. Neither complaint is new. Hobson made the first, Marx the second and many others have added elaborations. By contrast, the Classical-Marxian view bases itself on technological interdependence between industries and class relationships between families or persons. But this economic quarrel will not occupy the centre of the book and the first bone we wish to pick on our own account is philosophical. We dispute not only the Positivist doctrines behind orthodox methodology but also empiricism in general. Yet we do not follow those recent philosophers who therefore reject all traditional epistemology. Instead, we shall uphold a theory of knowledge assigning a crucial role to *a priori* knowledge, which we take to belong to the Rationalist tradition. It seems to us as true as ever that a scientific method must reflect a philosophy of science, which must reflect a theory of knowledge.

Crucial tenets of Empiricism

We begin by tracing the alliance between Positivism and Positive economics. This means addressing philosophical remarks to economists and economic remarks to philosophers. If we seem naive to those already familiar with the subtleties on both sides, we crave indulgence and, if our remarks are disconcertingly antiphonal, we urge patience. We should also confess at once that some philosophical issues we raise throughout the book no longer seem crucial to most Anglo-Saxon philosophers, at any rate in the form we give them. This is because Positivism and indeed all traditional epistemology are in eclipse at present. Our apologia is partly that the traditional philosophic problems still beset the philosophy of social science, which remains broadly empiricist, and partly that we ourselves simply do not agree that

[3] Two recent books deserving special mention, however, are R. M. Goodwin, *Elementary Economics from the Higher Standpoint* (Cambridge University Press, 1970) and Andras Brody, *Proportions, Prices and Planning* (North-Holland, 1970).

the eclipse is merited. So let us begin with a sketch of Empiricism, of which Positivism is the best-worked-out variant, and a promise to our economic readers to show it as an indispensable background to standard introductory chapters on methodology.

Empiricism, is, negatively, the denial that anything can be known about the world *a priori* or without benefit of experience. The history of the world, as an empiricist sees it, is the story of a series of states in which there happen to be patterns. Nothing *must* be as it is, no event *must* have any particular cause, no state *must* be followed by any one other state. Consequently we can never know *a priori* what will happen next and science has to progress by generalising from experience. Logic or reasoning alone cannot tell us which of infinitely many possible worlds we live in, nor which of infinitely many possible continuations from the present state will, in fact, occur. Scientific laws and explanations could be discovered *a priori*, only if ours were the only possible world. Besides, all our knowledge of the world rests in the end on observation and we observe only that something is so or (if we may ignore the traditional philosophical problems about the past) was so or has always been so. We can never observe that anything *must* be as it is. There is, therefore, no room for the idea that causal laws are in any sense necessities in nature. We can thus pick out two crucial tenets of Empiricism:

(i) claims to knowledge of the world can be justified only by experience;
(ii) whatever is known by experience could have been otherwise.

It is tempting to add a third, that no statement about the objective world depends for its truth on whether it is believed. This certainly accords with most versions of Empiricism (and of Rationalism for that matter) and embodies the common view that human beings cannot make an empirical statement true by *fiat*. But it is rejected by Pragmatism, which we shall later present as the newest champion of Empiricism. So, although the usual distinction between belief and knowledge is part of the philosophical orthodoxy taught to apprentices, we cannot list it as definitive of Empiricism.

Empiricist philosphy of science cannot allow that there is any necessity about causal connections. Malthus' laws of population, for instance, even if genuine, cannot be treated as *iron* laws in the sense that they reveal what is bound to happen or that statements of them cannot be denied without contradiction. We have to be able to observe instances of causal connections. Accordingly, the notion of Cause is analysed (usually) in a way derived from Hume. At its simplest, to say that A causes B is to say that A is always followed by B in given conditions. This takes us a step beyond mere observation but an inductive licence to generalise from observed correlations to universal

ones does not offend the empiricist's insistence on the primacy of observation. Generalisations can be tested by observing whether suitable instances actually occur. There can be no basic difference in kind between causal laws and confirmed empirical generalisations, even if the title of 'law' is reserved for generalisations especially broad, useful, elegant or suggestive. This may prompt the objection that the citing of causal laws is supposed to *explain*, whereas generalisations merely describe. The empiricist replies that there is no ultimate basis for such a distinction. To explain an event, it is enough to cite confirmed generalisations from which the occurrence of the event could have been predicted. Prediction is our only weapon but it suffices and to predict is to explain in advance. Induction is the only coin which buys knowledge of what lies beyond direct observation. Since it is the only coin, prediction and explanation have to be two sides of it. To predict is to deduce an instance from a generalisation; to explain is to cover an instance with a generalisation.

The analytic–synthetic distinction and Positivist method

The last paragraph can serve as a rough account of the core of nineteenth-century Positivism. The idea still retains all its importance but has become embedded in a more forceful and elegant Logical Positivism, best introduced as a theory about the meaning and truth of statements.[4] All claims to knowledge can be treated as claims to know that a statement is true. The advance of science now becomes the progressive determination of the truth or falsity of statements. This may seem an artificial way of putting it but it clears the deck for the introduction of that great engine of Logical Positivist epistemology, the analytic-synthetic distinction.

A logical positivist holds that all cognitively meaningful statements are of just two exclusive kinds, analytic or synthetic. Very roughly, the former are statements of language, the latter statements of fact. More formally, a true statement is *analytic*, if it cannot be denied without contradiction or if its truth arises from the meanings of its terms; it is *synthetic*, if there are possible circumstances in which it would be (or would have been) false. For example, the statement that 'if the elasticity of demand is greater than unity, then a reduction in the price of a good will lead to an increase in total expenditure on the good' is analytic. For, were the total expenditure to fall, then it would follow logically not that the statement was false but that

[4] The clearest basic exposition is still A. J. Ayer's in *Language, Truth and Logic* (Dover Publications, 1936), and, despite the many later subtleties and developments in Logical Positivist philosophy of science and language, we regard Ayer's account of the epistemology of the position as still canonical. Other and later works will be found in the bibliography.

the elasticity of demand was not greater than unity. This is a mere consequence of our defining terms like 'elasticity of demand' as we do and does not reveal some grand causal law about the working of the economy. On the other hand, the statement that 'if investment is increased, there will be a rise in employment' is (in the absence of any theoretical proof of it) synthetic. It is no less a universal statement but whether it is true depends on observation and induction and there is no logical contradiction in denying it. It states a relation which holds (if it does) as a matter of fact and so does claim to express a causal law.

This analytic-synthetic distinction guards an apparently weak flank of Empiricism. For it seems at first sight that logic alone can sometimes tell us which of infinitely many possible worlds we live in, in the sense that some truths are both necessarily true and informative about our world. For instance, that certain relations hold under imperfect competition appears to be a fact about a type of market for which no empirical evidence is needed, since the theorist can prove it *a priori*. If this interpretation were accepted, it would follow at once that experience is not always needed to justify claims to knowledge of the world. So an empiricist who admits that there are necessary or *a priori* truths must add that they do not state empirical facts. He does so by insisting that they are analytic and therefore not synthetic. This involves him, as we shall see later, in three further and separate claims about analytic truths – that they are linguistic, that they are man-made and that they make no empirical assertions. All three claims can be (and will be) disputed but, while they stand, they serve to protect the basic tenets of Empiricism from refutation by the existence of necessary truths.

This view of analytic truths is so crucial to logical positivism that it is worth spelling out how it arises. The root question concerns the relation of *a priori* and empirical in human knowledge or, for present purposes, the relation of pure theory to fact. Can pure theorising discover truths to which experience is bound to conform (on pain of being dismissed as misleading)? Empiricists are bound to say, No. The denial can be made by refusing to recognise a class of *a priori* truths at all, but this is not the logical positivists' way. Logical positivists have a positive use for *a priori* truths, once rendered harmless. So they contend that *a priori* truths make no empirical assertions. But this is not self-evident and reasons must be given for accepting it. So the next move is to deny that theorising is a process of discovery. Again, however, this is not self-evident – psychologically indeed it is plainly false. So, to give epistemological justification, systems of pure theory are construed by analogy with languages, the meanings of whose terms depend on the semantic rules for combining them. As typically with the theorems of logic, *a priori* truths are deemed to result from the definitions and rules of the systems in which they occur. Even so, however, more needs

to be said, since, were these rules immutable in any important sense, truths resulting from them would reveal at least immutable ways of conceptualising and ordering experience and even perhaps immutable features of the experience ordered. So it has to be shown both that *a priori* truths have as subject matter not things but concepts and that the rules they depend on are mutable. It has to be shown that a change in the rules can, by changing the meaning of sentences, change the truth of *a priori* propositions expressed by them but cannot change the truth of empirical propositions. To put it informally, different geometries involve different truths but there is just one set of facts to determine the truth of propositions in botany. (It is as if language were a system of prices for *a priori* truths and of values for empirical truths.) Hence Logical Positivism rests crucially on the claim that *a priori* truths result from man-made rules which we can, in principle, change.

All knowledge of the world can thus be expressed in synthetic statements, whose truth cannot be guaranteed *a priori* and must be established by observation and induction. Conversely, since any state of the world might have been different, analytic truths are not about the world. This is the point of saying that they depend on the meanings of their terms, are true by definition or, in a phrase to be discussed in Chapter 6, are 'true by convention'. A bold and complete distinction has been drawn between language and fact, between pure theories and hypotheses, between what we invent and what we must discover, between *a priori* and empirical knowledge. Analytic and synthetic truths have a different sort of subject matter and statements of causal laws belong strictly among those which are for observation and induction. Synthetic statements are refutable. We can summarise Logical Positivism by adding four further tenets to our list:

(iii) all cognitively meaningful statements are either analytic or synthetic but not both;
(iv) synthetic statements, being refutable, cannot be known true *a priori*;
(v) analytic statements have no factual content;
(vi) analytic truths are true by convention.

Positivism in its earlier days had hesitated about the place of logic and mathematics in empirical science. Logical and mathematical truths are part of our stock of knowledge but, being irrefutable in principle, cannot convincingly be seen as empirical generalisations. Logical Positivism removed the hesitation by dubbing all such truths analytic, as just described. By the same token, there should no longer be a puzzle about the role of theory in science. The term 'theory' has various uses but, with the help of the analytic-synthetic distinction, we should be able to reduce them to

two. A 'theory' may be what we have just called a 'pure theory', in which case it serves to transform synthetic statements about data into synthetic predictions. (For instance, the theory of Exchange-rate Adjustment turns statements of the current balance of trade and other indicators into predictions of the results of a devaluation.) Or 'theory' may be a synonym for 'hypothesis' or the name of a set of hypotheses, in which case theoretical statements are synthetic. There is no mystery here, so long as we do not confuse the two uses, and what is called theory often includes both kinds of statement. This reflects the fact that the Positivist method of science is partly deductive, in that deduction helps to prepare hypotheses for testing and to interpret the results of the tests. We are thus led to ground which economists will find familiar, the famous hypothetico-deductive method, best illustrated with a diagram. Figure 1 is taken from R. G. Lipsey's *Introduction to Positive Economics* (3rd ed., Harper and Row, 1972), which presents a widely-held point of view with striking clarity.[5]

Figure 1 includes some pointers to the discussion in later chapters. Definitions and hypotheses are grouped together under the heading of 'assumptions'. 'Predictions' are equated with 'implications'. When the theory conflicts with the facts, there is apparently a choice of responses. A 'theory' is presumably a set of assumptions and their implications. Fitting these methodological points into the context of Positivism, we get two further tenets:

(vii) a known causal law is a well enough confirmed empirical hypothesis;
(viii) the test of a theory is the success of its predictions.

Finally there are two deliberate omissions. Value judgements are excluded and there is no mention whatever of economics in Figure 1. Value judgements are excluded in the spirit of the famous distinction between 'positive' and 'normative' statements, which is crucial to this view of science. 'Positive' statements are all those which a dispassionate observer could make while remaining ethically neutral. They can include facts about the ethical norms of the agents studied but must not add any ethical reckoning of those norms. 'Normative' statements are those explicitly or implicitly containing the word 'ought'. Admittedly this way of putting the distinction is less clear than it looks, since it lumps together the idea of moral judgement with that of evaluation of ends (as we shall see later when we discuss rationality), but for the present we are content to note its importance for Positive economics. There is no mention of economics in Figure 1 because,

[5] Analogous versions can be found in any number of other textbooks, e.g. A. A. Walters, *An Introduction to Econometrics* (Norton, 1970) and J. M. Henderson and R. E. Quandt, *Microeconomic Theory: A Mathematical Approach* (McGraw-Hill, 1971).

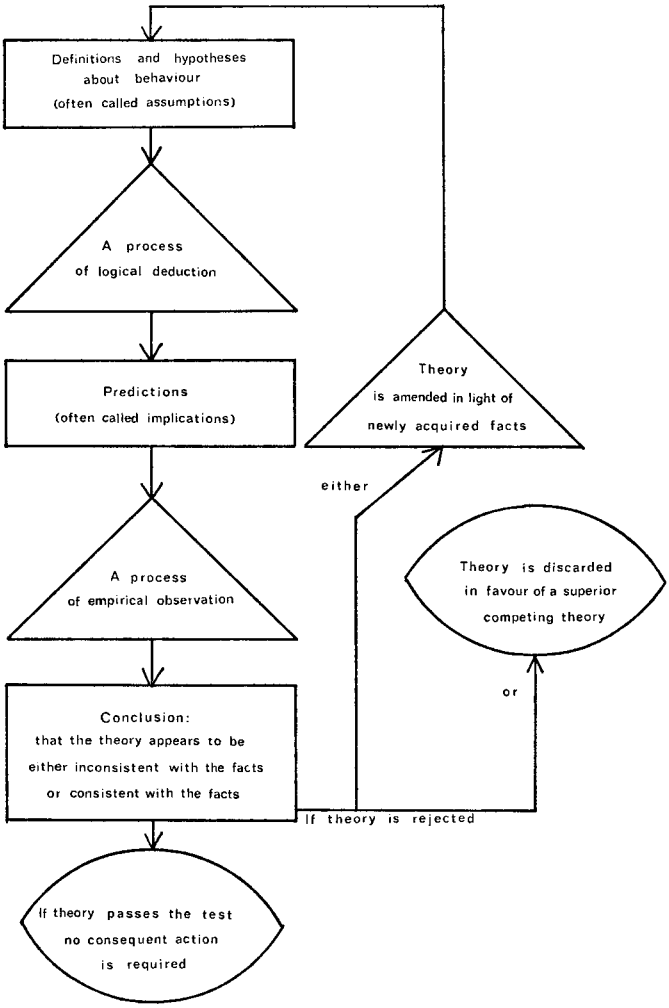

Figure 1

given the theory of knowledge already sketched, the Positivist method of science is bound to be a universal one. The difference between economics and, say, sociology or physics lies in their different subject matter and not in the method of scientific explanation which is applied. Taking these hints, we may add:

(ix) judgements of value have no place in science;
(x) sciences are distinguished by their subject matter and not by their methodology.

We have now staked out our main philosophical target with ten tenets, which it may be as well to repeat:

(i) claims to knowledge of the world can be justified only by experience;
(ii) whatever is known by experience could have been otherwise;
(iii) all cognitively meaningful statements are either analytic or synthetic but not both;
(iv) synthetic statements, being refutable, cannot be known true *a priori*;
(v) analytic statements have no factual content;
(vi) analytic truths are true by convention;
(vii) a known causal law is a well enough confirmed empirical hypothesis;
(viii) the test of a theory is the success of its predictions;
(ix) judgements of value have no place in science;
(x) sciences are distinguished by their subject-matter and not by their methodology.

We regard tenets (vii), (viii), (ix), (x) as defining a philosophy of science, which springs from Logical Positivism (iii), (iv), (v), (vi), which is a theory of knowledge in the empiricist tradition (i), (ii). This is our prime philosophical target (although we shall not neglect Pragmatism). To show that it is canonical, we cite Professor Samuelson:

> All sciences have the common task of describing and summarizing reality. Economics is no exception. There are no separate methodological problems that face the social scientist different in kind from those that face any other scientist ... Finally it is clear that no *a priori* empirical truths can exist in any field. If a thing has *a priori* irrefutable truth, it must lack factual content. It must be regarded as a meaningless proposition in the technical sense of modern philosophy.[6]

The Inductive and Deductive problems

Before laying our economic groundwork, we shall call attention to two key epistemological problems, facing all theories of knowledge, which form the philosophical theme of the book. One concerns Induction, the other Deduction. If these problems strike our economic readers as too gruellingly philosophical to be relevant to economics, we must again urge patience. We are convinced that philosophical definitions of the role of theory partly determine the kind of theory which an economist accepts. Indeed the most hard-headed economist is secretly a philosopher too. In later chapters we

[6] From his *Collected Scientific Papers*, ed. J. E. Stiglitz, (M.I.T. Press, 1966), vol. II, paper no. 126, p. 1751.