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LOGICAL POSITIVISM is the name given in 1931 by A. E. Blumberg and Herbert Feigl to a set of philosophical ideas put forward by the Vienna circle. Synonymous expressions include "consistent empiricism," "logical empiricism," "scientific empiricism," and "logical neo-positivism." The name logical positivism is often, but misleadingly, used more broadly to include the "analytical" or "ordinary language philosophies developed at Cambridge and Oxford.

HISTORICAL BACKGROUND

The logical positivists thought of themselves as continuing a nineteenth-century Viennese empirical tradition, closely linked with British empiricism and culminating in the antimetaphysical, scientifically oriented teaching of Ernst Mach. In 1907 the mathematician Hans Hahn, the economist Otto Neurath, and the physicist Philipp Frank, all of whom were later to be prominent members of the Vienna circle, came together as an informal group to discuss the philosophy of science. They hoped to give an account of science which would do justice -as, they thought, Mach did not- to the central importance of mathematics, logic, and theoretical physics, without abandoning Mach's general doctrine that science is, fundamentally, the description of experience. As a solution to their problems, they looked to the "new positivism" of Poincare; in attempting to reconcile Mach and Poincare; they anticipated the main themes of logical positivism.

In 1922, at the instigation of members of the "Vienna group," Moritz Schlick was invited to Vienna as professor, like Mach before him (1895-1901), in the philosophy of the inductive sciences. Schlick had been trained as a scientist under Max Planck and had won a name for himself as an interpreter of Einstein's theory of relativity. But he was deeply interested in the classical problems of philosophy, as Mach had not been.

Around Schlick, whose personal and intellectual gifts particularly fitted him to be the leader of a cooperative discussion group, the "Vienna circle" quickly established itself. Its membership included Otto Neurath, Friedrich Waismann, Edgar Zilsel, Bela von Juhos, Felix Kaufmann, Herbert Feigl, Victor Kraft, Philip Frank -although he was by now teaching in Prague- Karl Menger, Kurt Godel, and Hans Hahn. In 1926 Rudolf Carnap was invited to Vienna as instructor in philosophy, and he quickly became a central figure in the circle's discussions; he wrote more freely than the other members of the circle and came to be regarded as the leading exponent of their ideas. Carnap had been trained as a physicist and mathematician at Jena, where he had come under Frege's influence. Like other members of the circle, however, he derived his principal philosophical ideas from Mach and Russell.

Ludwig Wittgenstein and Karl Popper were not members of the circle but had regular discussions with its members. In particular, Wittgenstein was in close contact with Schlick and Waismann. Wittgenstein's Tractatus Logico-philosophicus had a profound influence on the deliberations of the circle, where it was interpreted as a development of British empiricism.

The circle ascribed to Wittgenstein the "verifiability principle" -that the meaning of a proposition is identical with the method of verifying it- that is, that a proposition means that the set of experiences which are together equivalent to the propositions being true. Wittgenstein, they also thought, had shown how an empiricist could give a satisfactory account of mathematics and logic. He had recognized that the propositions of logic and mathematics are tautologies. (The logical positivists paid no attention to Wittgenstein's distinction between tautologies and identities.) They are "independent of experience" only because they are empty of content, not because, as classical rationalists had argued, they are truths of a higher order than truths based on experience.

In the German-speaking countries, the Vienna circle was a small minority group. For the most part, German-speaking philosophers were still committed to some variety of "German idealism." Neurath, with his strong sociopolitical interests, was particularly insistent that the circle should act in the manner of a

political party, setting out to destroy traditional metaphysics, which he saw as an instrument of social and political reaction.

In 1928 the significantly named Verein Ernst Mach (Ernst Mach Society) was set up by members of the circle with the avowed object of "propagating and furthering a scientific outlook and creating the intellectual instruments of modern empiricism.' To welcome Schlick back to Vienna in 1929 from a visiting professorship at Stanford, California, Carnap, Hahn, and Neurath prepared a manifesto under the general title Wissenschaftliche Weltauffassung, Der Wiener Kreis ("The Scientific World View: The Vienna Circle"). This manifesto traced the teachings of the Vienna circle back to such positivists as Hume and Mach, such scientific methodologists as Helmholtz, Poincare, Duhem, and Einstein, to logicians from Leibniz to Russell, utilitarian moralists from Epicurus to Mill, and to such sociologists as Feuerbach, Marx, Herbert Spencer, and Karl Menger. Significantly absent were any representatives of the "German tradition" -even, although somewhat unfairly, Kant.

In order to make its conclusions familiar to a wider world, the circle organized a series of congresses. The first of these was held in Prague in 1929 as a section of a mathematical and physical, not a philosophical, congress. It was jointly sponsored by the Ernst Mach Society and the Society for Empirical Philosophy, a Berlin group led by Hans Reichenbach and with such members as Walter Dubislav, Kurt Grelling and Carl Hempel, which stood close in its general approach to the Vienna circle.

Meanwhile, the international affiliations of the circle were increasing in importance. American philosophers like C. W. Morris emphasized the link between logical positivism and American pragmatism; Ernest Nagel and W. V. Quine visited Vienna and Prague. In Great Britain, logical positivism attracted the interest of such Cambridge-trained philosophers as L. Susan Stebbing and John Wisdom and the Oxford philosophers Gilbert Ryle and A. J. Ayer, the latter participating for a time in the deliberations of the circle. In France such philosophers of science as Louis Rougier were attracted by logical positivism, as were a [p. 53] group of Neo-Thomists led by General Vouillemin, who welcomed the positivist critique of idealism. In Scandinavia, where the way had been prepared by the antimetaphysical philosophy of Hagerstrom, a number of philosophers sympathized with the aims of the logical positivists; Eino Kaila, Arne Naess, Ake Petzall, and Jorgen Jorgensen were prominent representatives of the international movement centering on logical positivism. The Polish logicians, especially Alfred Tarski, exerted a considerable influence on members of the circle, particularly on Carnap. German philosophers, except for Heinrich Scholz of Munster and the Berlin group, remained aloof. Undoubtedly, the organizational energies of the circle did much to bring into being in the 1930s an international community of empiricists; this was largely a consequence of the circle's isolation within German countries themselves.

Meanwhile the circle was publishing. In 1930 it took over the journal Annalen der Philosophie and renamed it Erkenntnis. In the period from 1930 to 1940 it served as a "house organ" for members of the Vienna circle and their associates. In addition, the circle prepared a series of monographs under the general title Veroffentlichungen des Vereines Ernst Mach (from 1928 to 1934) and Einheitswissenschaft (edited by Neurath from 1934 until 1938).

During the 1930s, however, the Vienna circle disintegrated as a group. In 1931 Carnap left Vienna for Prague; in that year Feigl went to Iowa and later to Minnesota; Hahn died in 1934; in 1936 Carnap went to Chicago and Schlick was shot by a mentally deranged student. The meetings of the circle were discontinued. The Ernst Mach Society was formally dissolved in 1938; the publications of the circle could no longer be sold in German-speaking countries. Waismann and Neurath left for England; Zilsel and Kaufmann followed Feigl, Carnap, Menger, and Godel to the United States. Erkenntnis moved in 1938 to The Hague, where it took the name Journal of Unified Science; it was discontinued in 1940. Logical positivism, too, disintegrated as a movement, absorbed into international logical empiricism.

CRITIQUE OF TRADITIONAL PHILOSOPHY

Mach denied that he was a philosopher. He was trying, he said to unify science and, in the process, to rid it of all metaphysical elements; he was not constructing a philosophy. The general attitude of the Vienna circle was very similar. Schlick was the exception. With logical positivism, he argued, philosophy had

taken a new turn, but logical positivism was nonetheless a philosophy. Carnap, in contrast, wrote that "we give no answer to philosophical questions and instead reject all philosophical questions, whether Metaphysics, Ethics or Epistemology" (The Unity of Science, p. 21). Philosophy, on his view, had to be destroyed, not renovated.

Undoubtedly, this intransigent attitude to philosophy can in part be explained by the peculiar character of German idealism and its hostility to science. The logical positivists thought of themselves as extending the range of science over the whole area of systematic truth and as needing for that purpose to destroy the claim of idealist philosophers to have a special kind of suprascientific access to truth.

Metaphysics. Of the traditional branches of philosophy, the positivists rejected transcendental metaphysics on the ground that its assertions were meaningless, since there was no possible way of verifying them in experience. Nothing that we could possibly experience, they argued, would serve to verify such assertions as "The Absolute is beyond time." Therefore, the positivists held, it tells us nothing. The rejection of transcendental metaphysics was not a novelty; Hume had described transcendent metaphysics as "sophistry and illusion" and had alleged that it makes use of insignificant expressions, Kant and the Neo-Kantians had rejected its claim to be a form of theoretical knowledge; Mach had sought to remove all metaphysical elements from science. But whereas earlier critics of metaphysics had generally been content to describe it as empty or useless or unscientific, the logical positivists took over from Wittgenstein's Tractatus the rejection of metaphysics as meaningless. The propositions of metaphysics, they argued, are neither true nor false; they are wholly devoid of significance. It is as nonsensical to deny as to assert that the Absolute is beyond time.

Epistemology. Neo-Kantians had sometimes suggested that philosophy could be reduced to epistemology or "theory of knowledge," which discussed such topics as "the reality of the external world." But assertions about the external world, the positivists argued, are quite as meaningless as assertions about the Absolute or about things-in-themselves. For there is no possible way of verifying the assertion that there is, or that assertion that there is not, an external world independent of our experience. Realism and idealism, considered as epistemological theses, are equally meaningless. So far as epistemology has any content, it reduces to psychology, to assertions bout the workings of the human mind, and these have nothing to do with philosophy.

Ethics. The logical positivists disagreed about ethics. Of course they all rejected any variety of transcendental ethics, any attempt to set up a "realm of values" over and above the world of experience. Assertions about values thus conceived, fall within the general province of transcendental metaphysics and had therefore to be rejected as nonsensical. But whereas Schlick sought to free ethics from its metaphysical elements by converting it into a naturalistic theory along quasi-utilitarian lines, Carnap and Ayer argued that what are ordinarily taken to be ethical assertions are not assertions at all. To say that "stealing is wrong," for example, is neither, they suggested, to make an empirical statement about stealing nor to relate stealing to some transcendental realm. "Stealing is wrong" either expresses our feelings about stealing, our feelings of disapproval, or, alternatively (positivist opinions differ about this), it is an attempt to dissuade others from stealing. In either case, "stealing is wrong" conveys no information.

Philosophical meaninglessness. In general, the positivists explained, when they said of philosophical assertions that they were meaningless, they meant only that they lacked "cognitive meaning." Ethical and metaphysical [p. 54] assertions have emotional associations; this distinguishes them from mere jumbles of words. Such statements as "God exists" or "Stealing is wrong" are, on the face of it, very different from a collocation of nonsense syllables. But the fact remains, the positivists argued, that such "assertions" do not convey, as they purport to do, information about the existence or character of a particular kind of entity. Only science can give us that sort of information.

Not all philosophers, however, have devoted their attention to describing pseudo entities like "the Absolute" or "values" or "the external world." Many of them have been mainly concerned with empirical-looking concepts like "fact, "thing," "property," and "relation." Russell's lectures on logical atomism and Wittgenstein's Tractatus are cases in point.

Wittgenstein suggested, however, that the sections in the Tractatus in which he talked about facts, or attempted to show how propositions can picture facts, must all in the end be rejected as senseless -as attempts to say what can only be shown. For it is impossible in principle to pass beyond our language in order to discuss what our language talks about. Philosophy is the activity of clarifying; it is not a theory.

Schlick carried to its extreme Wittgenstein's Tractatus doctrine that philosophy is an activity. Philosophy, he suggested, consists in the deed of showing in what the meaning of a statement consists; that is, philosophy is a silent act of pointing. The ultimate meaning of a proposition cannot consist in other propositions. To clarify, therefore, we are forced in the end to pass beyond propositions to the experience in which their meaning consists.

This view won few adherents. It was generally agreed that philosophers could not avoid making the sort of ontological assertions Wittgenstein made in the Tractatus and that it is altogether too paradoxical to suggest that all propositions about, for example, the relation between facts and language are nonsensical, even if "important" nonsense. Neurath, in particular, insisted that nonsense cannot be "important," cannot act as a ladder by which we arrive at understanding, as Wittgenstein had said.

Statements about language. Carnap suggested that Wittgenstein was mistaken in supposing that his ontological assertions were without any sense. They were, however, meaningful assertions about language, not about a world beyond language. No doubt, Carnap admits, ontological statements have the appearance of being about the world or, at least, about the relation between language and the world. But this is so only because they have been wrongly formulated in what Carnap calls "the material mode."

Carnap distinguishes three classes of sentences: object sentences, pseudo object sentences, and syntactical sentences. Any ordinary sentence of mathematics or science is an object sentence. Thus, for example, "Five is a prime number" and "Lions are fierce" are both object sentences. Syntactical sentences are sentences about words and the rules governing the use of words. For example, "Five is not a thing-word but a number-word" and "Lion is a thing-word" are syntactical sentences. Pseudo object sentences are peculiar to philosophy; they look like object sentences but if rightly understood turn out to be syntactical sentences. To understand them rightly we have to convert them from the "material mode" into the "formal mode," that is, from sentences which look as if they are about objects into sentences which are obviously about words. Examples are "Five is not a thing but a number" and "Lions are things." Once these sentences are converted out of the "material mode" into the corresponding "formal" (or syntactical) mode, they can be discussed; in the material mode they are quite undiscussible.

But how are syntactical disputes to be settled? Suppose one philosopher asserts and another denies that "numerical expressions are class-expressions of the second level" -Carnap's "translation" of "numbers are classes of classes"- how is it to be determined which is correct? All such statements, Carnap argues, are relative to a language; they are either statements about the characteristics of some existing language or proposals for the formation of a new language. Fully expressed, that is, they have the form "In language L, such-and-such an expression is of such-and-such a type." It can be immediately determined whether such a syntactical statement is true by examining the language in question.

PROBLEMS OF POSITIVISM

Verifiability. The course taken by the subsequent history of logical positivism was determined by its attempts to solve a set of problems set for it, for the most part, by its reliance on the verifiability principle. The status of that principle was by no means clear, for "The meaning of a proposition is the method of its verification" is not a scientific proposition. Should it therefore be rejected as meaningless? Faced with this difficulty, the logical positivists argued that it ought to be read not as a statement but as a proposal, a recommendation that propositions should not be accepted as meaningful unless they are verifiable. But this was an uneasy conclusion. For the positivists had set out to destroy metaphysics; now it appeared that the metaphysician could escape their criticisms simply by refusing to accept their recommendations.

Recognition of this difficulty led Carnap to suggest that the verifiability principle is an "explication," a contribution to the "rational reconstruction" of such concepts as metaphysics, science, and meaning, to be

be justified on the quasi-pragmatic grounds that if we ascribe meaning only to the verifiable we shall be able to distinguish forms of activity which are otherwise likely to be confused with one another. It is not, however, by any means clear in what way the verifiability principle can be invoked against a metaphysician who takes as his point of departure that his propositions clearly have a meaning. The most that can be said is that the onus is then on the metaphysician to distinguish his propositions from others which he would certainly have to admit to be meaningless.

A second set of problems hinged on the nature of the entities to which the verifiability principle applies. Since "propositions" had ordinarily been defined as "that which can be either true or false," it seemed odd to suggest that a proposition might be meaningless. Yet it was no less odd [p. 55] to suggest that a sentence -a set of words- could be verified, even if there was no doubt that it could be meaningless. Ayer suggested as an alternative the word "statement," and he wrote as if the problem were a purely terminological one. But it is a serious question whether "true," "false," and "meaningless" are alternative descriptions of the same kind of occurrence or whether to describe a sentence as "meaningless" is not tantamount to denying that any statement has been made, any proposition put forward. This would have the consequence that we can consider whether a statement is verifiable only after we have settled the question of the meaning of the sentence used to make the statement.

The logical positivists themselves were much more concerned about the fact that the verifiability principle threatened to destroy not only metaphysics but also science. Whereas Mach had been happy to purge the sciences, the logical positivists ordinarily took for granted the substantial truth of contemporary science. Thus, it was a matter of vital concern to them when it became apparent that the verifiability principle would rule out as meaningless all scientific laws.

For such laws are, by the nature of the case, not conclusively verifiable; there is no set of experiences such that having these experiences is equivalent to the truth of a scientific law. Following Ramsey, Schlick suggested that laws should be regarded not as statements but as rules permitting us to pass from one singular statement to another singular statement. In Ryle's phrase, they are "inference-licenses." Neurath and Carnap objected to this on the ground that scientific laws are used in science as statements, not as rules. For example, attempts are made to falsify them, and it is absurd to speak of "falsifying a rule." Furthermore, Carnap pointed out, ordinary singular statements are in exactly the same position as laws of nature; there is no set of experiences such that if I have these experiences there must be, for example, a table in the room.

For these and comparable reasons "verifiability" was gradually replaced by "confirmability" or by the rather stronger notion of "testability." Whereas at first the meaning of a proposition had been identified with the experiences which we would have to have in order to know that the proposition is true, now this was reduced to the much weaker thesis that a proposition has a meaning only if it is possible to confirm it, that is, to derive true propositions from it. Carnap, in accordance with his "principle of tolerance," was prepared to admit that a language might be constructed in which only verifiable propositions would count as meaningful. He was content to point out that such a language would be less useful for science than a language which admits general laws. But most positivists, interested as they were in the actual structure of science, simply replaced the verifiability principle by a confirmability principle.

If, however, the original principle proved to be too strong, the new principle threatened to be too weak. For, on the face of it, the new principle admitted as meaningful such metaphysical propositions as "Either it is raining or the Absolute is not perfect." Whether the confirmability principle can so be restated as to act as a method of distinguishing between metaphysical statements as meaningless and scientific statements as meaningful remains a question of controversy.

Unification of science. A further set of problems hinges on the question of what sort of things act as "verifiers" or "confirmers." One of Mach's main concerns, which the logical positivists shared, had been to unify science, especially by rejecting the view that psychology is about an "inner world" that is different from the "outer world" which physical science investigates. The doctrine that both physics and psychology describe "experiences" made such a unification possible. In his earlier writings Carnap tried to show in detail how "the world" could be constructed out of experience, linked together by relations of similarity.

But then a new difficulty arose; one about how it is possible to show that one person's experiences are identical with another's. On the face of it, an experience-based science is fundamentally subjective; science is verified only at the cost of losing its objectivity.

To overcome this difficulty, Schlick drew a distinction between "content" and "structure." We can never be sure, he argued, that the content of our experience is identical with the content of any other person's experience, for example, that what he sees when he says that he sees something red is identical with what we see when we say we see something red. For scientific purposes, however, this does not matter in the slightest. Science is interested only in the structure of our experience, so that provided, for example, we all agree about the position of red on a color chart, it is of no importance whether our experience of red differs.

Yet Schlick still thought that such "experiences" are what gives content, meaning, to science, converting it from a conceptual frame into real knowledge. Thus, it appears that the ultimate content of science lies beyond all public observation. There is no way of verifying that another person is even experiencing a content, let alone a content which is like or unlike the content of my experience.

Physicalist theories. Profoundly dissatisfied with the conclusion that the ultimate content of scientific truths is private, Neurath was led to reject the view -which logical positivists had so far taken for granted- that it is "experiences" which verify propositions. Only a proposition, he argued, can verify a proposition. Carnap accepted this conclusion and developed the conception of a "protocol statement," the ultimate resting point of verifications, a statement of such a nature that to understand its meaning and to see that it is true are the same thing. Carnap still suggested, however, that a protocol statement records a private experience, even though every such statement -indeed every statement- can be translated into the public language of physics. Statements of the form "Here now an experience of red" can, he argued, be translated into statements about the physical state of the body of the person who has the experience of red. (Subsequently this "physicalist" thesis was expressed in the weaker form, that every statement is linked by means of correspondence rules with the statements of physics.)

Neurath was still dissatisfied. Protocol statements, he argued, must form part of science as distinct from merely being translatable into its language. Otherwise, science [p. 56] still rests on essentially private experience. In fact, protocol statements must take some such form as "Otto Neurath reports that at 3:15 p.m. there was a table in the room perceived by Otto." The effect of this suggestion, as Schlick remarked with horror, is to leave open the possibility that the basic protocol statements may not be true. They, rather than some natural law with which they are incompatible, can be rejected as false. Schlick persisted in arguing that the ultimate confirmations of scientific propositions must be experiences of the form "here, now, blue" -which he described as "the only synthetic statements which are not hypotheses." Carnap came to agree with Neurath, however, that all synthetic statements are hypotheses.

At first, indeed, Carnap replied to Neurath by invoking his principle of tolerance. One has a free choice, he argued, between a language which incorporates protocol statements and a language into which they can be translated. Subsequently he has moved more and more in Neurath's direction. Statements of the form "the body Carnap is in a state of green-seeing," he now suggests, are sufficient to act as confirmations, and it is not necessary at any point to use the "phenomenal language" which Mach had thought to be the basic language of science. But Carnap still writes as if the issue between physicalist and nonphysicalist hinges on the choice of a language. Logical positivism, we might say, split into three groups, one asserting physicalism, the second rejecting it, and the third expressing a preference for the physicalist language.

In his *Logical Syntax of Language* Carnap had argued that all statements about the "meaning" or "significance" of statements are of the "pseudo object" type and should be translated into a syntactical form. Thus, for example, "This letter is about the son of Mr. Miller" has to be read as asserting that in this letter a sentence occurs which has the expression "the son of Mr. Miller" as its subject. This was a highly implausible doctrine, since, clearly, a letter can be about the son of Mr. Miller without using the phrase"the son of Mr. Miller." Under Tarski's influence Carnap decided that his original thesis had been unduly restrictive; philosophy had to refer to the semantical as well as the syntactical characteristic of language in order to give a satisfactory explication of, for example, the conception of "truth." Now Carnap found himself in opposition to Neurath. To try to pass beyond language to what language signifies, Neurath

argued, is at once to reintroduce the transcendental entities of metaphysics. The subsequent development of semantics at Carnap's hands would have done nothing to relieve Neurath's qualms. Language can be constructed, Carnap argues, in a variety of ways, and the question whether, for example, one accepts a language which includes names for abstract entities is a matter of practical convenience, not admitting of argument at any other level. The influence of Mach on Carnap's thinking has now been almost entirely dissipated; he writes, rather, in the spirit of a Poincare or a Duhem.

THE INFLUENCE OF POSITIVISM

Logical positivism, considered as a doctrine of a sect, has disintegrated. In various ways it has been absorbed into the international movement of contemporary empiricism, within which the disputes which divided it are still being fought out. Originally, it set up a series of sharp contrasts: between metaphysics and science, logical and factual truths, the verifiable and the nonverifiable, the corrigible and the incorrigible, what can be shown and what can be said, facts and theories. In recent philosophy, all these contrasts have come under attack, not from metaphysicians but from philosophers who would in a general sense be happy enough to describe themselves as "logical empiricists." Even among those philosophers who would still wish to make the contrasts on which the logical positivists insisted, few would believe that they can be made with the sharpness or the ease which the logical positivists at first suggested.

Logical positivism, then, is dead, or as dead as a philosophical movement ever becomes. But it has left a legacy behind. In the German-speaking countries, indeed, it wholly failed; German philosophy, as exhibited in the works of Heidegger and his disciples, represents everything to which the positivists were most bitterly opposed. In the United States, Great Britain, Australia, the Scandinavian countries, and in the other countries where empiricism is widespread, it is often hard to distinguish the direct influence of the positivists from the influence of such allied philosophers as Russell, the Polish logicians, and the British "analysts." But insofar as it is widely agreed that transcendental metaphysics, if not meaningless, is at least otiose, that philosophers ought to set an example of precision and clarity, that philosophy should make use of technical devices, derived from logic, in order to solve problems relating to the philosophy of science, that philosophy is not about "the world" but about the language through which men speak about the world, we can detect in contemporary philosophy, at least, the persistence of the spirit which inspired the Vienna circle.