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1

The Vienna Circle

Philosophers are not generally known for being team players. Philosophical ideas may sometimes be attributed jointly to two or more thinkers, but it often turns out that these people disagreed on fundamental issues, or that they worked in separate countries or even separate centuries. John Locke and George Berkeley are both regarded as influential 'British Empiricists', yet much of Berkeley's major published work was dedicated to arguing against Locke (Berkeley 1710). Gottlob Frege and P. F. Strawson are credited with introducing the logical account of presupposition that is sometimes referred to as the 'Frege-Strawson account'. But Frege worked and wrote in late nineteenth-century Jena, Strawson in mid-twentieth-century Oxford (Frege 1892, Strawson 1950). Even when philosophers manage to coincide and apparently to agree, they are generally reluctant to admit that they form an identifiable group or collective. The widespread use of the term 'ordinary language philosophy' would seem to suggest that a particular approach, or school, predominated in Oxford in the years after the Second World War. But those who worked in Oxford at this time, and to whom the label has been applied, have been keen to deny that any such school even existed (see, for instance, Grice 1986: 50).

The Vienna Circle was unusual. It consisted of a large but identifiable group of philosophers who met regularly, collaborated on work of mutual interest, and largely agreed on their conclusions. They even acknowledged their group identity by coining the term 'The Vienna Circle', or 'Der Wiener Kreis', in the title of a collaborative manifesto (Carnap et al. 1929). There were, of course, differences of interest, of emphasis and even of opinion. But commentaries on the work of the Circle, both from members and from outside observers, have repeatedly emphasized the cooperation, collaboration and consensus that it

generally exhibited. A. J. Ayer commented that when he visited Vienna in the early 1930s he found that the tenets for which it is still best known 'were not considered by the members of the Circle as open to question' (Ayer 1987: 26).

Also unusually among philosophical movements, the work of the Vienna Circle had fairly clearly demarcated start and end dates. Philosophy had, of course, been practised in Vienna for centuries, and during the early years of the twentieth century various informal meetings and discussion groups with broadly empirical and scientific interests had been formed. But the defining event was the appointment of Moritz Schlick to the chair in philosophy of the inductive sciences at the University of Vienna in 1922. Although never interested in being seen as the leader of a philosophical movement, Schlick was enthusiastic and charismatic, and naturally attracted a group of like-minded students and colleagues. This group, numbering about 20, became known unofficially as the 'Schlick Circle' and then more officially as the 'Vienna Circle'. The end of the Circle was abrupt, and was driven by political rather than intellectual events. Increasingly mistrusted and persecuted by the occupying power because of its perceived socialist leanings, the Vienna Circle was broken up in 1938 and many of its members forced into exile. Writing in 1950, Circle member Victor Kraft reminded his readers that their work 'has not been finished but was suddenly disrupted' (Kraft 1953: vii).

The reasons for the unusually collaborative and consensual nature of the Vienna Circle are less clear-cut than those for its formation and dissolution. Nevertheless some plausible explanations, both historical and academic, have been suggested. When Schlick arrived in Vienna, the Austrian tradition was for intellectual activity to take place in public. Ideas were developed not in private houses or in university rooms, as was the tradition in, for instance, Britain, but in the context of discussion groups and societies. Barry Smith has linked what he calls this 'characteristically Austrian predilection' to 'the culture of the coffee house' (Smith 1987: 35), and indeed the first meetings of the Schlick Circle were informal gatherings in cafés. David Edmonds and John Eidinow have made a similar connection, drawing attention to the 'intersecting cultural, social and academic circles' that formed themselves around the numerous cafés in early twentieth-century Vienna (Edmonds and Eidinow 2001: 58).

The members of the Vienna Circle were not just inhabitants of an unusually gregarious city. They were also predominantly scientists by training. Schlick had come to philosophy via physics, having studied in

Berlin under Max Planck. He was instrumental in the appointment of Rudolf Carnap as instructor in philosophy at the University of Vienna in 1926. Carnap had also begun his academic career in physics. In his intellectual autobiography he described how as a young physicist he found that his interests were in the theoretical, rather than the experimental, aspect of the discipline. His initial idea for a doctoral dissertation was rejected by the head of physics at the University of Jena with a recommendation that Carnap try the philosophy department. Carnap's chosen tutor in philosophy then recommended that he submit the proposal to the head of physics. Carnap ended up a philosopher rather than a physicist almost by accident; he stuck with the same tutor but chose a more clearly philosophical doctoral topic (Carnap 1963: 11). Among other members of the Vienna Circle, Friedrich Waismann and Hans Hahn both had backgrounds in mathematics. Otto Neurath had studied many disciplines, including mathematics, economics and statistics, as well as his primary subject of sociology. Scientists are used to collaborating and to working in teams. It is not implausible that the members of the Vienna Circle brought these habits with them to their philosophical discussions.

Given the backgrounds of its members, it is perhaps not surprising that the work of the Vienna Circle has had a strong influence on subsequent discussions of the philosophy of science, and of scientific method. But it also had a huge impact on the ways in which the study of language developed in twentieth-century philosophy. One thesis of this book is that, as a result, its influence has also been felt in the development of present-day linguistics. This would appear to be a less likely legacy for a group of scientifically minded philosophers. A linguist looking for discussions of language among the work of the Vienna Circle would certainly find it. Carnap, for instance, took a keen interest in language, and went on to write books with such apparently promising titles as *Introduction to Semantics* (Carnap 1946). But in fact Carnap was unenthusiastic, even dismissive, about natural language as a subject of study, as opposed to artificially constructed languages used in the exposition of logic and of scientific theories. For instance, another book with a title that might seem appealing to linguists, *The Logical Syntax of Language*, included the comment that 'In consequence of the unsystematic and logically imperfect structure of the natural word-languages (such as German or Latin), the statement of their formal rules of formation and transformation would be so complicated that it would hardly be feasible in practice' (Carnap 1937b: 2). This statement would be anathema to the present-day linguist. In the decades that followed the

publication of this book, linguistics proceeded as if in direct defiance of Carnap's warning.

The impact of the Vienna Circle on linguistics cannot be traced, then, to anything that its members had to say on the subject of language itself. Rather, it stems from a very specific and technical claim that they agreed on about the nature of scientific knowledge, and from the implications of the key terms of that claim. The 'principle of verification', as it has become known, is the tenet most closely associated with the Vienna Circle. It is primarily about the security of knowledge. It certainly touches on language, but only because knowledge finds expression in language, so a clarification of what can be known relies on a clarification of what can be said. It is surprisingly difficult to track down a concise statement of the principle of verification by a member of the Vienna Circle. They wrote around the subject and wrote about the different issues involved, but seem not to have felt the need to produce a specific slogan. This task fell to their self-appointed publicist A. J. Ayer, who published *Language, Truth and Logic* in 1936 in a deliberate and successful attempt to introduce the ideas of the Vienna Circle to a larger audience. In the second edition of this book he reflected from a greater distance on the ideas that had so enthused him a decade earlier. In doing so, he summarized the principle of verification as claiming that 'a sentence had literal meaning if and only if the proposition it expressed was either analytic or empirically verifiable' (Ayer 1946: 7). This is an extraordinarily succinct statement of a complex and sophisticated philosophical position. It is sparse and deceptively simple looking, yet contains the main precepts of a major philosophical movement. It also contains clues as to why the philosophy of the Vienna Circle has had such an impact on the subsequent study of language, and why that impact was largely driven by a reaction against what the Circle's critics found in its dogmas.

The reasons why the principle of verification took the form it did, why it was the cornerstone of a philosophical movement and why Carnap said such harsh things about natural language, can all be traced to the major philosophical allegiances of the members of the Vienna Circle. They were, first and foremost, empirical in their philosophical outlook. This is perhaps not surprising for a group from predominantly scientific backgrounds; empiricism had long been the touchstone of scientific method and description. But in philosophy, empiricism had been beset by problems and counter-examples that had at times threatened to overwhelm it. In maintaining an empirical philosophical line the members of the Vienna Circle were not simply accepting, or proposing

to live with these problems; they thought they had found a way to solve them.

Early in the twentieth century the problems for empiricism were well established and to some philosophers seemed insurmountable. The basic claims of empiricism have an enduring commonsense appeal: that our knowledge of the world around us is built up from our experiences of it, and that our confidence in this knowledge derives from the immediacy of our own experience. Empiricism offers a reassuringly 'real world' measure for distinguishing those beliefs that stand up to rational scrutiny and discussion. It enjoyed a particular heyday during the Enlightenment. John Locke, for instance, proposed to demonstrate 'how men, barely by the use of their natural faculties, may attain to all the knowledge they have, without the help of any innate impressions, and may arrive at certainty without any such original notions or principles' (Locke 1690: Book I, Chapter II: 1). For philosophers like Locke, empiricism offered a check on irrational beliefs, superstitions and, crucially, the need to posit the existence of innate ideas.

The problems for empiricism were aired in some Enlightenment responses to Locke, perhaps most fully by Immanuel Kant. Kant did not take issue with experience as an important, indeed a necessary, source of knowledge. But he argued that it was not sufficient to explain the full range of what human beings know. There were many types of knowledge that could not be explained simply by establishing the existence of relevant data in the world. In identifying this weakness in empiricism, Kant drew attention to knowledge that is *a priori*, as opposed to *a posteriori*: that seems to precede any experience of the world rather than to follow from it. He noticed that not just analytic, but also some types of synthetic, statements must be *a priori*. An example such as 'All bodies are extended' is analytic because the predicate does not offer anything more than part of the definition of the subject. We do not draw on experience of the world but simply on acquaintance with the language for knowledge of the truth of this example. Part of knowing the meaning of 'all bodies' is to know that 'extended' applies to it. There would appear to be a clear distinction between this type of example and synthetic statements. 'All bodies are heavy' is not necessarily true just because of the words it contains. To determine its truth value it is necessary to look beyond the language and to consult the evidence available in the world; our knowledge of this example is *a posteriori*. But Kant argued that the distinction between analytic and synthetic did not follow neatly along the same border as that between *a priori* and *a posteriori*. There is some knowledge which is expressed in synthetic

statements but is independent of any experience of the world. Empiricism fails.

Knowledge that is synthetic but *a priori* is knowledge that relies on some human system for making sense of the world: some system that is not itself found in experience. Mathematical knowledge is a central example. Kant drew attention to the impossibility of ever independently 'proving' the statements of mathematics, because their truth depends on the unempirical rules of mathematics themselves. 'The assertion that $7 + 5$ is equal to 12 is not an analytic proposition. For neither in the representation of 7, nor in that of 5, do I think the number 12' (Kant 1781: A164). The link between subject and predicate depends not just on their meanings but on the system that determines how they are combined. It is not possible to consult the facts of the world in this case without doing so through the lens of the very mathematical system that has produced the proposition in question. ' $7 + 5 = 12$ ' is a synthetic statement, but our knowledge of it is *a priori*. Mathematics apparently has no place in an empirical system of knowledge: the very sort of system that, because of its importance in the sciences, might most be expected to need mathematics.

Empiricism was rescued from this plight by developments in logic around the turn of the twentieth century. These made possible the work of the Vienna Circle, together with all its implications for the study of language. The developments in question took place over several years, involved a number of theoreticians, and are formidable in their complexity and technicality. But they can be summarized in two main points. Firstly, logic became much more formalized than it had previously been, with the development of a symbolic language fully to express logical formulas and relations. Secondly, and as a result of this development, symbolic logic was shown to be adequate to express the propositions of mathematics; in other words, mathematics was reduced to logic. It is difficult to establish exactly who deserves the credit for these two developments. It is clear, however, that two events were especially significant: Frege's breakthroughs in his work on logic and mathematics and the publication of Russell and Whitehead's *Principia Mathematica*.

Gottlob Frege is celebrated in language study today mainly for his distinction between 'sense' and 'reference', but his development of a system of symbolic logic is of at least equal importance. He established the systems of quantifiers and variables characteristic of modern logic, systems that allow for logical statements that generalize over many particular instances. 'France is a republic', 'The Thames has many tributaries'

and 'The Earth revolves around the Sun' have many obvious differences, but they can all be analysed, and shown to have structural properties in common, by expressing them in the formula of predicate logic ' Fx '. They are all of simple subject-predicate form, ' F ' being the usual symbol to stand in for any predicate and ' x ' for any subject. Michael Dummett has explained that 'the discovery of the mechanism which enabled this analysis to be given, and the realization of its significance, are due to Frege' (Dummett 1973: xiv).

As a student between 1910 and 1914, Rudolph Carnap attended Frege's classes in Jena. Frege's teaching was formal and, even to a class of three, devoid of interaction, but Carnap was impressed by his ideas, and in particular his claim 'that the new logic to which he had introduced us, could serve for the construction of the whole of mathematics' (Carnap 1963: 5). It is not clear from Carnap's account whether Frege did in fact substantiate this claim. The first published attempt to reduce mathematics to logic came in 1910 in *Principia Mathematica*. Russell himself later credited Frege with showing 'in detail how arithmetic could be deduced from pure logic, without the need for any fresh ideas or axioms' (Russell 1924: 32). Certainly, Russell and Whitehead borrowed notation from Frege, as well as from the Italian mathematician Peano. Their explicitly stated aim was similar to Frege's insight; they planned to construct a logical notation 'with a view to the perfectly precise expression, in its symbols, of mathematical propositions' (Russell and Whitehead 1910: 1). Carnap saw their achievement as a fuller development of what had impressed him in Frege's programme, and an inspiration to think of philosophical concepts and propositions in terms of symbolic logic (Carnap 1963: 11).

As Frege had shown, an entirely formal system for describing logical relations generalizes over individual statements. It does not offer a full account, let alone a full semantic representation, of any individual expression. It is a closed system, explaining relations between terms, but having nothing to say about how those terms, or the formulas that result from combining those terms, relate to anything outside the system. Russell and Whitehead explained how in logical formulas truth can be derived simply by combining propositions of known truth value, without any recourse to empirical evidence outside the system. Logical formulas are not about the world and cannot be assessed against any data. They are, in effect, tautologies; what they express are necessary truths within the system. Russell and Whitehead's success in applying this same framework to mathematics was the breakthrough that made the Vienna Circle's new form of empiricism possible. The statements of

mathematics were capable of being expressed in terms that made them necessary truths. Contrary to Kant's conclusion, mathematics did not produce synthetic statements of which human beings had *a priori* knowledge. Mathematical statements were analytic after all, so the fact that knowledge of them could not be independently justified was no challenge to empiricism. If Russell and Whitehead set the agenda for the next phase in empiricist philosophy, they also offered something like a manifesto for the rejection of ordinary language from philosophical consideration. Their introduction contained a numbered list of reasons why symbolic notation was to be preferred to natural language, including the inexact nature of word meaning, the many purposes, irrelevant to logic, that language was adapted to serve and the frequent mismatch between grammatical and logical structure. The structure of ordinary language 'does not represent uniquely the relations between the ideas involved. Thus, "a whale is big" and "one is a number" both look alike, so that the eye gives no help to the imagination' (Russell and Whitehead 1910: 2).

The reinvigorated form of empiricism developed by the Vienna Circle depended heavily on logic and has sometimes been described as 'logical empiricism'. This seems to have been the description most favoured by Schlick himself. But an article published in 1931 and aimed at introducing these ideas to an uninitiated audience chose 'logical positivism'. The authors of this article described the term as 'perhaps the best among many poor ones' (Blumberg and Feigl 1931: 281–2), and it has in general proved the most tenacious. It associates the work of the Vienna Circle with positivism, an empirical tradition of the nineteenth century that valued knowledge derived scientifically and deplored metaphysics and superstition. The term 'logical positivism' came to be used by some as a term of opprobrium, and as such almost inevitably was overextended to apply to anything that smacked of hard-nosed scientific analysis at the expense of speculation and synthesis. Writing in 1959, A. J. Ayer commented wryly that those who included, for instance, Russell, Wittgenstein and even Austin in their definition of logical positivism were doing so because 'they wish to tar all their adversaries with a single brush' (Ayer 1959: 3). Nevertheless it remains a convenient shorthand for a particular approach to the nature of scientific knowledge and to the language in which that knowledge is expressed, and more generally for the philosophical approach of the Vienna Circle.

That approach was based on the application of the radical and logical new version of empiricism to the business of philosophy itself: to questions of how it should be done and of what philosophers could and could not

legitimately say. Ayer's summary of verification, quoted earlier, is again useful here: 'a sentence had literal meaning if and only if the proposition it expressed was either analytic or empirically verifiable'. Sentences expressing analytic propositions were exempt from the usual requirements of empiricism because they were necessarily true, and, therefore, not dependent on contingencies in the world. Logical and mathematical statements could now be included in this category. Verification was to handle everything else: the vast body of statements expressing synthetic propositions offering descriptions of the world. According to the Vienna Circle only a subset of those statements that purported to describe the world were actually meaningful and, therefore, appropriate to scientific and philosophical discussion.

The claim that meaningful statements are those that can be verified, or subjected to an identifiable process of testing against experience, suggests a debt to Wittgenstein. The question of how influential Wittgenstein's ideas of this period were on the Vienna Circle has puzzled many commentators, even those who were themselves members of the Circle. It is remarkably similar in type and in controversy to the question of the extent of the influence of Wittgenstein's later work, his 'meaning is use' phase, on the development of ordinary language philosophy in post-war Oxford. In response to both questions there are those who assume that the influence was direct and decisive and others who argue that it was, at most, circumstantial. Certainly Wittgenstein's *Tractatus Logico-Philosophicus* was read carefully and admired at early meetings of the Vienna Circle. Wittgenstein, a native of the city, was in Vienna between 1925 and 1929 and was invited to attend meetings of the Circle. He chose instead to meet with just Schlick, Carnap and Waismann, who then conveyed news of what they had heard back to the full Circle. But after a time Wittgenstein broke off even this restricted contact, and personal relations with the Circle became strained, particularly with Carnap, whom Wittgenstein accused of publishing ideas taken from him without acknowledgement.

Wittgenstein was undoubtedly impressed and influenced by the work on logic of his former teacher Russell. But he did not share Russell's interest in mathematics. Rather, he was concerned with using logic as a way of modelling language. However, at this stage in his career Wittgenstein shared Russell and Whitehead's disdain for natural language. As Russell points out in his 'Introduction' to the first English translation of the *Tractatus*, no actual natural language was to provide the basis for Wittgenstein's study because natural language was necessarily messy and imprecise. Rather, 'Mr Wittgenstein is concerned with

the conditions for a logically perfect language ... [because] the whole function of language is to have meaning, and it only fulfils this function in proportion as it approaches to the ideal language which we postulate' (Russell 1922: x). A rigorous logical analysis was to determine what was sayable, or possible, in a logically perfect language, and, therefore, to highlight what in everyday language was illegitimate, or meaningless. Famously, Wittgenstein urged silence in those areas where logically legitimate language was not possible: areas that included metaphysics, aesthetics and ethics.

The terminology involved in Wittgenstein's account of logically justified language is notoriously tricky, not least because of the process of translation from his German, and because he was himself neither always clear nor always consistent in his usage. In effect, every meaningful statement must be either a simple, atomic proposition or must be shown to be derived from the combination of simple propositions. Simple propositions are meaningful because they give us a picture or a model of reality. They comprise names for objects in the world and tell us something about the properties or relations of those objects. More complex statements are built up from logically permitted operations over simple propositions and derive meaning and truth value from those simple propositions. Negation and conjunction are two examples of such operations. In common with many members of the Vienna Circle, Wittgenstein came to philosophy from a background in the more applied sciences. He had trained as an aeronautical engineer in Manchester before moving to Cambridge in order to study under Bertrand Russell. Susan Sterrett has suggested a direct link between Wittgenstein's technical training and the central conception of the *Tractatus*. Aeronautics depended crucially on the construction of scale models to predict accurately the effects of wind and speed, and Sterrett argues that 'foundational works on the methodology of engineering scale models ... figured in writing the *Tractatus*', where Wittgenstein conceived of propositions as models, or pictures, of reality (Sterrett 2006: xix).

There are, perhaps, three main points in Wittgenstein's vastly ambitious, obscure and enigmatic programme in the *Tractatus* that would seem to have had an effect on logical positivism. First, he claimed that to determine truth or falsity we need to compare a proposition with the world: 'A proposition can be true or false only in virtue of being a picture of reality' (Wittgenstein 1922: 4.06). Second, Wittgenstein drew out the implications of *Principia Mathematica* that logic, including mathematics, is ultimately a closed system that can express only

tautologies: ‘all the propositions of logic say the same thing, to wit nothing’ and ‘The propositions of logic are tautologies’ (Wittgenstein 1922: 5.43 and 6.1). And third, he concluded that whatever cannot be resolved to simple propositions made up of simple names is just meaningless. The vast class of meaningless sentences include those used in much traditional philosophical discussion, such as metaphysics. The statements of metaphysics, therefore, have no place in serious philosophical discussion, and the problems they apparently pose are mere pseudo-problems, which have arisen because philosophers have not paid sufficiently close attention to logic. The only real way to do philosophy is ‘to say nothing except what can be said, i.e. propositions of natural science – i.e. something that has nothing to do with philosophy – and then, whenever someone else wanted to say something metaphysical, to demonstrate to him that he had failed to give a meaning to certain signs in his propositions’ (Wittgenstein 1922: 6.53).

The status of the simple propositions that for Wittgenstein were the touchstone of meaning remained somewhat obscure in the *Tractatus*. Wittgenstein did not commit himself as to whether the aspects of reality they pictured must be capable of being empirically observed. Russell seemed to think not. In his ‘Introduction’ he pointed out that the ‘simples’ that made up atomic facts were not necessarily available to inspection. Rather, a simple was ‘a logical necessity demanded by theory, like an electron’ (Russell 1922: xiii). When the ideas of the *Tractatus* were taken on board at meetings of the Vienna Circle, however, a much more clearly empirical interpretation was given to the notion of a simple, or elementary proposition. Jikko Hintikka has pointed out that ‘The members of the Vienna Circle interpreted the elementary propositions (*Elementarsätze*) of the *Tractatus* as speaking of the content of one’s immediate experience’ (Hintikka 1993: 28). Appeals to immediate experience bring with them all the complications associated with the status of that experience, in other words of the relationship between the sense data that verify a proposition and the possibility of reality that is in itself inaccessible but that is the cause of those sense data. Logical positivism might appear to commit its adherents to realism, which itself has dangerously metaphysical leanings; if all we ever have access to are our own individual sense perceptions it is dubiously legitimate to claim definite knowledge that the physical world exists. Perhaps not surprisingly, logically minded philosophers of the time were generally reluctant to take a stand on the existence of the real world. Bertrand Russell declared himself agnostic in 1924 on the debate between realism and idealism, arguing that to him the distinction was of no real interest because ‘I hold

that logic is what is fundamental in philosophy, and that schools should be characterized rather by their logic than by their metaphysic' (Russell 1924: 31). Schlick seems to have taken much the same view: 'The denial of the existence of a transcendent external world would be just as much a metaphysical statement as its affirmation. Hence the consistent empiricist does not deny the transcendent world, but shows that both its denial and affirmation are meaningless' (Schlick 1932: 107).

The question of what logical analysis revealed to be meaningless, apparently posed by Wittgenstein, was a major theme for Carnap. He approached it by means of a rigorous analysis of language, and of what its rules determined to be sayable. The languages he was concerned with were, of course, artificially constructed languages, such as might be appropriate for logical exposition. The very fact that all natural languages allowed the expression of vague and unverifiable pseudo-propositions meant that such languages were not suitable for serious philosophical purposes. Statements were meaningless, that is they expressed pseudo-propositions, if their content could not be reduced to simple propositions. In every case, this would be because there was something wrong with the language in which the statement was expressed. Carnap summed up the types of problem that could arise with a statement. A language consisted of a set of words and a series of rules as to how these words could combine. In other words it comprised a vocabulary and a syntax. These two aspects of a language were sufficient to explain the two ways in which a statement could fail to have meaning. 'There are two kinds of pseudo-statements: either they contain a word that is erroneously believed to have meaning, or the constituent words are meaningful, yet are put together in a counter-syntactical way, so that they do not yield a meaningful statement' (Carnap 1932: 61).

The criteria of meaning outlined by Wittgenstein and given, more formally, syntactic and empirical expression by Carnap had far-reaching implications for philosophy. The Vienna Circle was not coy about these. In fact, they publicized their work as a new departure that would do away with many of the problems that had traditionally vexed philosophers by showing them to be expressed in meaningless statements and therefore not worthy of serious consideration. In 1929 Carnap, Hahn and Neurath published the pamphlet *Wissenschaftliche Weltauffassung. Der Wiener Kreis* ('The scientific conception of the world. The Vienna Circle') which both coined the name of the Vienna Circle and explicitly set out its philosophical manifesto. It defined the empiricism of the Vienna Circle: 'there is knowledge only from experience', and its methodology: 'scientific word-conception is marked by the application

of a certain method, namely logical analysis' (Carnap et al. 1929: 331). It identified ordinary language as ambiguous and, therefore, as a source of logical mistakes that had made metaphysics possible. It also dismissed 'the notion that thinking can ... lead to knowledge out of its own resources without using any empirical material', that is the notion of synthetic *a priori* knowledge (Carnap et al. 1929: 330).

The 1929 manifesto dealt with cultural and political, as well as purely philosophical, dimensions of the work of the Vienna Circle. Indeed, the historical context of the Circle is an important part of its story. The development of logical positivism coincided with social upheavals in Europe. In Austria in general, and in Vienna in particular, there was a spirit of cultural rebuilding after the destruction of the First World War. There was more concrete rebuilding afoot too. Functional new housing was needed for Vienna's population, recently swelled by mass migrations from rural districts. The city's appearance changed dramatically as the old, very obviously, gave way to the new. The Vienna Circle seemed quite self-consciously to have linked their new way of thinking to these changes. Just as architecture was to be sparse and functional, eschewing earlier ornateness in favour of clean lines and undisguised structure, so philosophy was to deal in transparent and testable statements of observation rather than subjective speculation. In an article on this link, Peter Galison has commented on 'the Vienna Circle's often-repeated self-conception of being at one with the spirit of modernism' (Galison 1993: 76).

The prevailing political outlook among the members of the Vienna Circle was largely socialist and progressive but they differed from each other in the extent to which they expressed these views, and in the degree of their political involvement and activism. The 1929 manifesto linked philosophical with social reform: that group of people that 'faces modern times, rejects [metaphysics and theology] and takes its stand on the ground of empirical science' (Carnap et al. 1929: 339). But in his later account of the workings of the Vienna Circle, Carnap distanced himself from this stance:

All of us in the Circle were strongly interested in social and political progress. Most of us, myself included, were socialists. But we liked to keep our philosophical work separated from our political aims. In our view, logic, including applied logic, and the theory of knowledge, the analysis of language, and the methodology of science, are, like science itself, neutral with respect to practical aims, whether they are moral aims for the individual, or political aims for a society.

(Carnap 1963: 23)

The philosophical, if not the political, campaigning continued. In 1930 Carnap together with Hans Reichenbach, a professor of philosophy at the University of Berlin, took over the journal *Annalen der Philosophie* and relaunched it under the title *Erkenntnis* as a mouthpiece for the Vienna Circle. It continued until 1940 and published articles by many of the members of the Circle. The very first article to be published was by Schlick and was uncompromisingly entitled 'The turning point in philosophy'. True to his title, Schlick argued that awareness of the rules of logical syntax, together with rigorous empiricism, would show that many of the formulations of traditional philosophy were simply not genuine. In fact, eventually 'it will no longer be necessary to speak of "philosophical problems" for one will speak philosophically concerning all problems, that is: clearly and meaningfully' (Schlick 1930: 59).

As well as the manifesto, individual publications, and the annexing of *Erkenntnis*, the Vienna Circle publicized their ideas by arranging a series of congresses around Europe. Their 'Congresses on Unified Science' were held during the mid-1930s in Paris, Copenhagen, Cambridge and Massachusetts. These were particularly significant in disseminating the new philosophical ideas to a wider, and often an enthusiastic, audience. One member of that audience was the Polish logician Alfred Tarski, at the time a lecturer in mathematics and logic at the University of Warsaw. Tarski was working on formal logic and semantics, especially in relation to the notion of truth. His work in this area interested members of the Vienna Circle, particularly Carnap. In 1930 Tarski had been invited to give a series of visiting lectures in Vienna, and during that visit he also engaged in various informal discussions with members of the Circle. As a result of these discussions Carnap became convinced that a suitably formal theory of language was of the highest significance to the clarification of the philosophical problems then besetting the Vienna Circle, a conviction that resulted in his own development of the theory of logical syntax (Carnap 1963: 30).

Tarski's theory of truth had perhaps the greatest impact on the Vienna Circle of all his work. He presented this at the Paris congress in 1935, but he had already published a version of it in 1933 under the title, 'The concept of truth in formalized languages'. In 1944 he published a more accessible summary of this work under the title, 'The semantic conception of truth'. Tarski's explicit aim in these works was to 'construct – with reference to a given language – a materially adequate and formally correct definition of the term "true sentence"' (Tarski 1933: 152, original emphasis). His perceived success in this venture led to the enthusiastic adoption of his theory of truth by the Vienna Circle. It did no less than

make the previously suspect term 'truth' acceptable in the vocabulary of logical positivism. The Circle's interest had been in the relationship between the expressions of a language and the world, certainly, but in terms of what made those expressions meaningful, and of what criteria established them as verifiable. On the subject of what actually made an expression true they had remained quiet. There was no satisfactorily rigorous definition of 'truth' that made it a term fit for logic. Indeed discussions of 'truth' were regarded as belonging more in metaphysics than in scientific philosophy. As Vann McGee has expressed it: 'Before Tarski's work, the notion of truth was regarded with grave suspicion, particularly by the logical positivists, who regarded the supposed connection between language and the world that makes true sentences true as the sort of quasi-mystical association that a scientific philosophy ought to eschew' (McGee 2006: 405–6). McGee even repeats the legend that Otto Neurath put 'truth' on a list of forbidden words.

As far as the Vienna Circle was concerned, Tarski rescued truth because he showed that it could be defined in syntactic and logical terms, instead of relying on a more or less vague semantic definition. In one sense, what Tarski was doing was anything but new. He was not attempting an entirely fresh account of truth, but was rather drawing on the 'correspondence' approach, dating back to Aristotle: the intuitively appealing explanation that a sentence is true if it corresponds to reality. The correspondence account had, of course, impeccable empirical credentials, referring as it did to the experiences of the world against which any expression must be judged. The problem was that it was irreparably vague. As it stood, it offered no account of what it might be for an expression to correspond to reality, or of how it might be possible to recognize that correspondence when it occurred. These issues had resurfaced in the vagueness of Wittgenstein's notion of the proposition as a 'picture' of reality, a problem that Wittgenstein had sidestepped by refraining from commenting on the status of elementary propositions.

Tarski's insight was that a successful account of truth must be modest in its ambitions. A rigorous account of truth in general was simply not possible, but what the logician could hope for was an account of what it was for a sentence belonging to a particular language to be true in that language. Tarski also noticed that in giving an account of truth it was necessary to distinguish between the language to which a certain sentence belonged and the language in which it was described. He defined the former as the 'object language' and the latter as the 'metalanguage'. The two must be kept strictly separate or discussion of the object language became impossible. Adapting Tarski's famous example, 'Snow is white

is true if snow is white' is meaningless, but "'Snow is white" is true if snow is white' is a significant statement about the conditions for truth of a certain sentence. In this latter example the quotation marks indicate that it is the name of the sentence, not the sentence itself, that appears as the subject of a further, separate sentence in the metalanguage.

As well as the need for a metalanguage, Tarski specified that an account of truth could only be offered for a formal language. Natural language was not appropriate for such a treatment because it was unbounded: there were no principled limits to what it contained and what descriptions it could offer. It was also beset by vagueness and ambiguity. As he expressed it in his original article, *'The attempt to set up a structural definition of the term "true sentence" – applicable to colloquial language is confronted with insuperable difficulties'* (Tarski 1933: 164, original emphasis). Instead, the logician must resort to a formal language, by which Tarski meant an artificially constructed language in which the sense of every expression was unambiguously determined by its form. To the Vienna Circle, who had already rejected natural language as unfit for philosophical usage, this restriction on the applicability of Tarski's account of truth would not, of course, have proved at all troubling.

Tarski rephrased the form for an expression in the metalanguage using logical variables, and came up with a generalized form that he labeled (T): 'X is true if, and only if, p'. Here 'X' is the name of any sentence in the object language, and 'p' is a proposition. 'If' has become 'if, and only if' because only one proposition can offer the conditions of truth for any sentence. In a formal language, unlike in natural language, every sentence expresses exactly one proposition, and every proposition finds expression in only one sentence. Tarski's (T) form, therefore, shows the way to a re-expression in logical form of the old correspondence account of truth. It is not itself a definition of truth. Rather, it shows how truth may be defined for a given sentence in a given language. Every equivalence of the form (T) 'may be considered a partial definition of truth, which explains wherein the truth of this one individual sentence consists. The general definition has to be, in a certain sense, a logical conjunction of all these partial definitions' (Tarski 1944: 344). A full account of truth in any language would consist of a set of (T) forms, one for each sentence in that language. The result may sound unwieldy and indeed unworkable to the present-day semanticist, but for the logician it is capable of precise definition and avoids any reference to an intangible connection or correspondence between language and the world.

Tarski's formal definition allowed the Vienna Circle to use the term 'truth' without embarrassment and to talk about sentences as having the property 'true' or 'false'. The decision between the two was, of course, to be determined by verification. A true sentence expressed a proposition that could be demonstrated to be true with reference to empirically available evidence: a proposition that made predictions about what would be found in the world that were borne out by observation. A false sentence expressed a proposition that made predictions that turned out to be contrary to the available evidence. To say that a sentence was false was a significantly different thing from saying that it was meaningless. Even to be capable of being either true or false a sentence must first be established as meaningful; it must comprise meaningful words arranged in a syntactically justifiable manner. To say that a sentence was false was to say that it was meaningful but made predictions contrary to the available evidence. To say that it was meaningless was to say that it failed to make any predictions that could be empirically tested.

For the Vienna Circle, many of the traditional statements and problems of philosophy fell into this latter category. This was their source of distrust, even at times of outright ridicule, of anything that might be labeled 'metaphysics'. Leading members of the Circle repeatedly insisted that they were not interested in claiming that metaphysical statements were false, but rather that they did not even reach the criteria of meaningfulness necessary to be found false. For instance, in an early edition of *Erkenntnis* Schlick argued that the main reason for opposition to the work of the Vienna Circle was the failure to understand the distinction between saying something was false and saying it was meaningless. "The empiricist does not say to the metaphysician "what you say is false", but, "what you say asserts nothing at all!" He does not contradict him, but says "I don't understand you"" (Schlick 1932: 107). In the previous edition of the journal, Carnap conceded that the claim that metaphysics, including all that had been said by eminent metaphysicians over the centuries, was meaningless would make many people uneasy. He suggested that although metaphysical statements did not offer descriptions of states of affairs, they did 'serve for the *expression of the general attitude of a person towards life*' (Carnap 1932: 78). And he went on to suggest that this sort of expression might more appropriately be achieved through poetry or even music.

The types of sentences that the Vienna Circle dismissed as meaningless included, inevitably, but perhaps most controversially of all, those

connected with religious belief. 'God' was a prime example of a word that, according to Carnap's classification, was meaningless and would therefore render meaningless any sentence in which it occurred. Such sentences could, of course, be used to express general attitudes or emotional responses to life, but, in effect, adherence to logical positivism was incompatible with a personal religious faith. Carnap himself came from a religious background and grew up with a faith that he abandoned as a student. In his intellectual autobiography he was scathing about theology in general, arguing, as might be expected, that its statements are simply lacking in any real content. He displayed a more tolerant, if faintly patronizing attitude towards expressions of personal faith: 'At the present stage of development of our culture, many people still need religious mythological symbols and images. It seems to me wrong to try to deprive them of the support they obtain from these ideas, let alone to ridicule them' (Carnap 1963: 8).

Carnap insisted that a lack of religious faith in no way implied moral nihilism, in himself personally or in others. A logical positivist outlook was perfectly compatible with taking a stance on how life ought to be lived. Despite this, and despite the fact that pronouncements on religion and on ethics played a very minor part in the work of the Vienna Circle, negative contemporary reactions were dominated by an attitude to those who espoused logical positivism as moral nihilists bent on the overthrow of social and ethical codes. A. J. Ayer commented on logical positivism that 'it has even been asserted, without a shadow of empirical evidence, that its advocates were corrupters of youth' (Ayer 1959: 22). The view of logical positivism as radical and subversive seems to have predominated in Austria during the 1930s, and was instrumental in the downfall of the Vienna Circle.

Logical positivism had always been on the margins of Austrian philosophy, even in Vienna. The Circle met on university premises, but out of hours on Thursday evenings in an unprepossessing building housing the Institute of Physics and Mathematics, on the outskirts of the university precinct. This contrasted sharply with the philosophy department where Schlick and some of the other members of the Circle worked during the day, housed in the main university building on Vienna's prestigious Ringstrasse, complete with classical columns and sweeping marble staircases. The distance was intellectual as well as physical and cultural. Barry Smith has described how at the very time when the Vienna Circle was in its heyday, the mainstream teaching and writing on philosophy at the University of Vienna concentrated on a rather old-fashioned style of the history of philosophy. 'The circle

around Schlick can be seen from this point of view to have consisted largely of philosophical outsiders or cranks, of individuals who would in fact be taken seriously only sometime later – and only without the boundaries of Austria herself' (Smith 1987: 47).

The more positive reactions that Smith describes, generally took place in the English- rather than the German-speaking philosophical world. From the early 1930s onwards, English language philosophy journals started taking note of this new approach to philosophy. Reactions were mixed, and remained so. Anthony Flew, writing in the early 1950s, commented of the Vienna Circle that 'at least in their published writings they often appeared narrow, dogmatic, philistine, uninterested in traditional philosophy, and militantly secular' (Flew 1953: 4). Many commentators, including Flew, dwelt on the Vienna Circle as a 'foreign' style of philosophy, and emphasized the difference between this and what was going on in Britain at the time. Gilbert Ryle looked back with the perspective of three decades on the 1920s and commented on the different attitudes to the relationship of traditional philosophy to science to be found in Vienna and in England:

The contrast between philosophy and science was drawn in both places. In Vienna, where the autonomy of the sciences was actually challenged the object was to expose the pretensions of philosophy as a governess-science. Here, where, save for psychology, the autonomy of the sciences was not seriously challenged, it was drawn in order to extract the positive functions of logic and philosophy. Philosophy was regarded in Vienna as a blood-sucking parasite; in England as a medicinal leech.

(Ryle 1951: 3)

Undoubtedly the single greatest stimulus to interest in logical positivism in England was the publication in 1936 of A. J. Ayer's *Language, Truth and Logic*. Ayer had travelled to Vienna a few years earlier; he had met with Schlick and had been invited to attend some meetings of the Circle. He was immensely impressed by what he heard, although his own limited grasp of German prevented him from taking a very active part in the discussion. On his return to England he set about writing a book that was to introduce the ideas of the Vienna Circle to a wider, that is to an English-speaking, world. The resulting radical and polemical interpretation of logical positivism caused quite a sensation. Reactions were both positive and negative, but together they brought logical positivism to the attention of many of those practising philosophy

immediately before the Second World War. Ayer himself later commented that 'I wrote it in the conviction that I had discovered the proper path for philosophy to follow, without trying to disguise the fact that I owed the discovery to others, and this conviction, however ill-founded it may turn out to have been, does give the book an abiding force' (Ayer 1987: 24). Ayer's biographer Ben Rogers has commented that: 'Despite the mixed reviews and limited sales, *Language, Truth and Logic* quickly achieved cult status among students and young intellectuals' (Rogers 2000: 124). Many believed the claim that logical positivism would show the way towards solving, or at least dissolving, many of the traditional problems of philosophy, and opening the way to a new, more rigorous and strictly empirical method of inquiry.

However, Ayer was aware that by the time he had visited the Vienna Circle in 1933 the movement was already past its prime. Certainly by the time the majority of the English-speaking philosophical world became aware of the Vienna Circle through *Language, Truth and Logic*, they were already reading about a piece of philosophical history. Carnap had left Vienna for a chair in Prague in 1931. Gustav Bergmann recalled that after this, Wittgensteinian views became more dominant, there was less interest in the principle of verification, and 'leadership of the discussion shifted more and more to Waismann' (Bergmann 1938: 202). Hans Hahn died in 1934 while only in his mid-50s. But by far the most significant catalyst in the decline of the Vienna Circle was the death of Moritz Schlick, who was murdered in June 1936 on the stairs leading to the philosophy department of the University of Vienna. Schlick's death seems to have been the work of an individual acting alone; he was shot at point-blank range by a former doctoral student who was a paranoid schizophrenic and had become hostilely obsessed with him. But it was undoubtedly convenient for the Austrian authorities, who were becoming increasingly suspicious of the Vienna Circle, with its socialist and reforming tendencies. The chair in philosophy of the inductive sciences was abolished in favour of concentrating on the history of philosophy. Schlick's murderer was found guilty but treated leniently, and, indeed, commanded a certain amount of public and media sympathy. The Vienna Circle, several of whom were Jewish, were viewed with increasing suspicion, and many of them began to make plans to use their international philosophical contacts to flee Austria.

After the German occupation of Austria in 1938 the persecution of the Vienna Circle became more overt and triggered a philosophical diaspora. Waismann went to Cambridge. Neurath had already moved to Holland, sensing the trend of Austrian political developments, and later

fled again, this time to England. Bergmann, assisted by Neurath, escaped to Holland and then to New York. All publications by the Vienna Circle were banned in Austria. Logical positivism was by no means over, and even the Vienna Circle had more to say. But after the German occupation the work was carried out by individual philosophers from their bases in new countries, particularly in the United States. There was another way in which the Vienna Circle continued to exert influence on philosophical developments. Philosophers who had not been members of the Circle, but who had learned of its work either first hand or through secondary sources were beginning to disseminate their responses. These responses, which were published largely in America, in England and in Scandinavia, are an essential part of the story of empiricism in the twentieth century. And they collectively represent the most significant impact of the work of the Vienna Circle on the study of language.

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