Introduction

THE ENLIGHTENMENT AND THE RISE OF LOGICAL EMPIRICISM

A certain recurrent, perhaps inextinguishable human ambition found its classic expression in the eighteenth-century Enlightenment, especially in the circle around the *Encyclopédie* of Diderot and d'Alembert: the ambition of shaping individual and social development on the basis of better and more reliable knowledge than the tangled, confused, half-articulate but deeply rooted conceptual systems inherited from our ancestors. The Enlightenment is identified with the idea that improved knowledge can be an instrument of individual and social liberation. People of whatever class or culture, given access to this knowledge and the tools to use it critically, are able in this view to emancipate themselves from their culture of origin and belong to a cosmopolitan republic of letters. Individuals who join this culture are better informed about the contexts of their lives, this story goes, and so are better able to make informed life choices and to take genuine civic responsibility. And societies composed of such citizens can use this knowledge to build pluralistic institutions that enable all their members to develop and pursue their aspirations autonomously. The cosmopolitan culture embodying this programme of life guided by better knowledge has never been entirely well defined, and even in the eighteenth century it took on a number of national guises. But these shared a common inheritance from classical antiquity, as well as a growing trans-national corpus of scientific (and, in the broad sense in which it was then still used, 'philosophical') knowledge, of political commentary, of literature, art, and music. These national variants of Enlightenment also shared many basic values, especially a basic respect for empirical knowledge and a striving for greater objectivity – the desire to overcome the limitations inherent in one's particular local point of view. While poverty and circumstance temporarily prevented the masses from participating in this cosmopolitan culture, the goal was to make it universal, and to enable everyone to participate without regard to

sex, race, or economic resources. Only the full participation of most citizens in this cosmopolitan culture, it was thought, could ultimately guarantee the viability of the envisaged democratic states of the future.

The Enlightenment was followed by an equally emblematic reaction against it, beginning in Germany: the Romantics rejected the cosmopolitan vision, and wanted no part in a cosmopolitan republic of letters. They resurrected pre-rational intuition, primal myth, the pre-articulate sense of belonging, the infinite yearning that could not be put into words. This was a kind of 'knowledge', they said, without which all explicit knowledge in the conventional sense was empty and lifeless. Music, mysticism, art, spontaneous and untutored inspiration were more reliable sources of truth than deliberative science and worldly knowledge. The local and authentic was exalted at the expense of the cosmopolitan and artificial. The spread of cosmopolitan knowledge to the masses was to be discouraged, as folk culture had more integrity than a deracinated, impersonal knowledge imposed from above. Economic growth, democratic politics, and urbanisation were also frowned on, as they tended to break down traditional, organic communities and rooted belonging. Like the Enlightenment, Romanticism was (in some of its versions, at least) a doctrine of liberation. But personal and social liberation had to be guided by flashes of inspiration, by poetry, art, and intuition rather than discursive knowledge. Romanticism, by its very nature, took very different forms in the various nations to which it spread; it was even less homogeneous than the Enlightenment.

But both these movements, the Enlightenment and Romanticism, still mark out their respective attitudes toward universal, cosmopolitan knowledge. Under various names, both traditions are very much with us today. On the worldly plane of government and commerce, in most western countries and all English-speaking ones, Enlightenment ideas have gone almost unchallenged as the dominant public ideology. In those countries, nearly all streams of political and social thought have proceeded from Enlightenment assumptions; Mill, Disraeli, and Marx were all on the side of science, progress, and the widest possible diffusion of cosmopolitan knowledge. Only in German-speaking Central Europe did Romanticism have any appreciable influence in the public sphere through the nineteenth century. This influence intensified toward the end of the nineteenth century, and became especially pronounced at the beginning of the twentieth.[1] The German Youth Movement, which had no parallel outside

[1] Otto Weininger is an example of this trend who has become known among English-speaking scholars because of his influence on Wittgenstein (Monk 1990); see also Sengoopta (2000).

Central Europe, was a neo-Romantic glorification of the 'natural' and primitive, in rebellion against the stuffy, materialistic petit-bourgeois culture of the post-1871 *Gründerjahre* that the young Nietzsche had eloquently complained about (Laqueur 1962). Thomas Mann's wartime diatribe against 'Western' – Enlightenment – civilisation is an indication of the tight grip that Romantic categories retained on a considerable proportion of the German educated classes.[2]

But the apogee of Romantic influence in German-speaking intellectual and public life came after Versailles. Much has been made of figures such as Heidegger, Carl Schmitt, or Ernst Jünger, but the phenomenon as a whole and its social context have yet to be adequately studied.[3] Spengler's *Decline of the West* was just one pinnacle in the vast neo-Romantic, anti-Enlightenment literature that appeared between 1918 and 1933. Another was the three-volume indictment of intellect, *Der Geist als Widersacher der Seele* (*The Intellect as the Enemy of the Soul*) by Ludwig Klages, whose taxonomy of human character had enjoyed wide popularity. Walter Rathenau, a finance mogul and minister in the Weimar government, wrote best-selling books whose tendency was hardly different. The cult following inspired by sages such as the poet Stefan George, and their impact on the writing of history, has often been noted.[4] Explicitly anti-scientific and anti-modern ideologies such as those of Rudolf Steiner enjoyed wide currency and even attained a degree of public acceptance. The atmosphere is well captured, and pitilessly satirised, in Musil's great novel *The Man without Qualities*.

The Vienna Circle is impossible to understand outside this very specific cultural context. The Circle reasserted Enlightenment values against this comprehensive Romantic fervour. It countered with an equally comprehensive programme of re-Enlightenment. Unlike previous German movements that had taken the Enlightenment partially on board – especially the venerable tradition of German classicism deriving from Goethe, Schiller, and Humboldt, within Kant's philosophical framework – the Vienna Circle resolved to accept no compromises. Everything was to be rethought from

[2] His *Betrachtungen eines Unpolitischen* (*Considerations of an Unpolitical Man*) (Mann 1918) returns constantly to the contrast, which had become a cliché by then, between German *Kultur* (which was inner, deep, and authentic) and Western *Zivilisation* (which was social, superficial, and artificial). Mann later changed his mind about the political burden of the book, and eventually became a supporter of the Weimar republic.

[3] A brief overview is provided by Hepp (1987). A well-informed recent study on one particular aspect is Noll's (1994) intellectual history of the Jung cult, painted against a broad panorama in Part I, Chapters 2–5, though the main focus here is on the period *before* 1914. Wolin (2004) offers a welcome broad perspective, whose overall diagnosis seems accurate. But his focus on only a few major figures somewhat obscures the major differences between France and Germany.

[4] E.g. by Gay (1968), though without being adequately placed in this wider context.

the bottom up. To begin with, the basis of scientific knowledge itself – the backbone of the cosmopolitan ideal – had to be reconstructed. The older Enlightenment philosophies of Mill, Comte, or Mach had been glaringly unable to cope with recent advances in the sciences. Instead, the Vienna Circle turned to Bertrand Russell, to Russell's student Wittgenstein, and to scientific thinkers such as Helmholtz and Poincaré. Russell had taken the lead, even before the First World War, in drawing attention to the wider implications of scientific knowledge, especially for traditional beliefs. He was a hero and role model for many younger intellectuals between the wars, even on the continent. In their philosophy as in their politics, the Vienna Circle sought to out-Russell Russell.[5]

On this basis, the Vienna Circle wanted to create a new kind of intellectual culture that would be adequate to scientific knowledge and democratic society. They wanted to replace the culture of German classicism, underpinned by Kant, with something better and more durable, something more unequivocally 'enlightened', though equally nourishing. The Vienna Circle was, in its way, the explicit voice of modernism. It preached a comprehensive, root-and-branch reformation of human mental and social life, and allied itself with movements in science, literature, politics, social thought, art, and architecture sympathetic to the idea that human life and culture must adjust to changed conditions of society and knowledge in the modern world.

The Vienna Circle hardly had time to plant its flag, though, before it fell victim to the political cataclysm heralded by the upsurge of Romanticism in the early twentieth century. The members of the Circle and its pendants in other Central European countries were scattered to the winds, and could only regroup in North America some years later. On the other hand, the Nazi disaster, though it dealt German universities a blow from which they never recovered, discredited Romanticism. The political and intellectual elites of the German-speaking states that emerged from the ruins of 1945 were thoroughly imbued with the ideals of cosmopolitan knowledge and scientific progress. Whatever attraction Romanticism had once enjoyed outside Germany also evaporated, and the scientific culture enjoyed unprecedented prestige, particularly in America, due not least to

[5] In the letter accompanying his *Aufbau* (1928a), Carnap says to Russell that he has here embarked on the programme sketched in Russell's *Our Knowledge of the External World*, but has carried it through more radically and consistently, so that he sees his book as '*Russellischer als Russell* ' ('more Russellian than Russell'). In an earlier letter, he alludes to Russell's pacifist activities during the war, and remarks that it is surely no coincidence that philosophers disciplined by the rigour of logic and natural science are also those who oppose war and oppression. See below, Chapter 5.

the prominent role of science and technology in winning the war. The Enlightenment was riding high. Nearly all developed countries underwent enormous expansions in their higher education systems, and the value of knowledge was unquestioned. Nor was this just an artefact of the Cold War; this basic value was shared across the Iron Curtain. Nearly all political ideals that regarded themselves as 'progressive' – whether socialist, communist, or liberal – were squarely in the Enlightenment camp. Even most conservatives embraced the basic tenets of the Enlightenment.

The Vienna Circle and its allies, now established across North America, benefited hugely from this surge of public confidence in cosmopolitan science. They and their students became the dominant force within the American academic discipline of philosophy after 1945. By 1960 they had largely displaced the previously dominant pragmatists and more traditionally-minded philosophers such as Carnap's Chicago colleague Richard McKeon. Philosophers such as Wilfrid Sellars, who did not share many 'logical empiricist' views (as they were now called), adapted their tone and vocabulary to the new outlook. In America, at least, 'analytic philosophy' came to be identified with Russell, early Wittgenstein, and – particularly – logical empiricism. It was seen as something of a technical subject, both scientific in its own approach and concerned largely with the workings of natural science. 'Philosophy of science is philosophy enough', Quine had said. He and Thomas Kuhn would later be regarded as having overthrown logical empiricism, but they themselves focused mainly on hard science, so the basic tenor and approach survived even if the doctrinal details changed. Nor was the influence of logical empiricism confined to academic philosophy; across the human and social sciences, its acolytes attempted to clean house, sometimes in rather crude and unreflective ways.

THE DECLINE AND FALL OF LOGICAL EMPIRICISM

But half a century has now passed since analytic philosophy established itself as the mainstream in English-speaking countries. We now live in a very different world. The shock of the Holocaust has worn off, science and technology are no longer universally admired, and higher education is starving, in most countries, rather than opulently expanding. The idea of a cosmopolitan Enlightenment is viewed with scepticism or indifference. And so analytic philosophy, too, is in decline. Though still quite well represented in philosophy departments at leading universities, its broader significance in its English-speaking heartlands is diminishing. It has less importance in the wider world of academic or educated discourse than at any time

since the 1920s, and much less than competing forms of general thought or reflection – whether or not these describe themselves explicitly as 'philosophy'. The decline in external influence is reflected within the discipline itself; analytic philosophy lacks a clear agenda. There is little agreement even about the problems it should be addressing or the questions it should be asking. Though it would be premature to pronounce it dead (it is most lively in certain specialised areas such as the philosophy of biology or of physics, and has claimed a niche within cognitive science), the general pattern is one of fragmentation, mutual alienation among its component groups, and the loss of a recognised centre of gravity – with respect not only to doctrine, but also to terminology, the canon of essential texts, and basic standards of rigour and clarity.

In the face of these developments, most analytic philosophers have striven to distance themselves from logical empiricism. From the beginning, in the 1920s and 1930s, dissenting voices within analytic philosophy had opposed the modernism and the scientific orientation of the Vienna Circle – Wittgenstein himself among them. But as fashions began to change in the 1980s, these internal dissenters were rapidly outflanked within the wider intellectual community, especially in the humanities, by more radical anti-modernists from other philosophical traditions. The earlier critiques of logical empiricism by Quine and Kuhn, though generally accepted within analytic philosophy, left the way open to more radical opposition by figures such as Rorty, Putnam, and a host of social-constructivist historians and sociologists of science. Some of these more radical critics have sided openly with the very metaphysical traditions the Vienna Circle originally attacked. The distinction between analytic philosophy and other philosophy has become blurred, then, and somewhat arbitrary. At present, analytic philosophy is no longer even clearly defined.

In the wider intellectual world, meanwhile, the reaction against 'logical positivism' is even more pronounced. Despite recent historical interest in the movement,[6] it is still regarded with almost universal disdain. It functions in the humanities and social sciences as a kind of 'other', against which almost anyone's own position may be defined or identified. The baleful influence of 'logical positivism' was felt so widely that it is now a recognised term of abuse in almost every field outside natural science. In

[6] Book-length studies include Coffa (1991), Uebel (1992a), Haller (1993), Stadler (1997), Richardson (1998), Friedman (1999, 2000), Mormann (2000), and Verley (2003). In addition, there are numerous conference volumes and journal special issues devoted to logical empiricism e.g. Giere and Richardson (1996), Parrini, Salmon, and Salmon (2003), Awodey and Klein (2004), as well as a growing number of contributions to the major journals. Cambridge Companions to Carnap and to Logical Empiricism are in progress. A 'Vienna Circle Institute' – in Vienna, but with international membership – organises regular conferences and has produced a steady stream of publications since about 1995.

economic methodology, for instance, 'logical positivism' is something like original sin (Blaug 1980, pp. 1–10; Hands 2001, pp. 72–88). 'Behaviourism' (regarded as a psychological version of 'positivism') is synonymous with backwardness in cognitive science (e.g. Lowe 2000, pp. 41–4). In the study of history, 'positivism' is the one thing all can agree on rejecting.[7] And even a textbook on research in social work can organise itself conceptually around the nemesis of 'logical positivism' (Tyson 1995). This widespread rejection in turn exacerbates the embarrassment felt by analytic philosophers and redoubles their hurry to disavow any residual connection with the barbaric past. In an overview of the work in philosophy of language and mind over the half-century up to the 1990s, for instance, Tyler Burge blames the present lack of interest in analytic philosophy among the wider intellectual public on the intolerance of the logical empiricists (Burge 1992, p. 3). A reference work on twentieth-century philosophy of science claims that the death of logical empiricism 'was due not only to the dispersal of its members, but to a widespread recognition of the defects of its ideas' (Hanfling 1996, p. 193). In another recent history of analytic philosophy, the movement is not credited with much originality, and appears only briefly.[8] The general attitude is perhaps best summed up by Richard Rorty. 'Most of us philosophy professors now look on logical positivism with some embarrassment, as one looks back on one's own loutishness as a teenager' (Rorty 1998, p. 32).

This book will argue that these – understandable – responses are seriously misguided. The 'logical empiricism' they reject was never propounded by any of its leading figures, whose actual doctrines have been largely ignored. This book will try to spell those doctrines out. It will focus on the particular case of Rudolf Carnap, generally acknowledged the philosophical leader of the group.[9] It will try to state Carnap's main ideas clearly, and explain how they developed. As we will see, these ideas bear little resemblance to

[7] Logical empiricism as applied to history is – somewhat unfortunately – associated largely with a series of papers by C. G. Hempel which generated lively discussion in the 1950s and 1960s, but are now regarded by both philosophers and historians with little interest. Two quite different appraisals of this development are offered by Danto (1995) and Dray (2000).

[8] Chapters 12 and 13 of Soames (2003) discuss 'logical positivism' – which Soames does not regard as much of an advance over Russell and the *Tractatus* (pp. 257–8) – but this discussion uses A. J. Ayer's *Language, Truth, and Logic* as its main text. This (as we will see below, pp. 34–5) is rather like relying solely on texts of Wolff for a discussion of Leibniz.

[9] Though I would not go as far as Quine, who claims, 'The significance of the Vienna Circle, as a concerted movement, can be overestimated. We are told of the evolving doctrine of the Circle when what is really concerned is the doctrine of an individual, usually Carnap . . . When one speaks of the Vienna Circle or logical positivism, one thinks primarily of Carnap. We do better to think of him as Carnap' (Quine 1984, p. 325). Carnap himself certainly did not see matters in this light, and even the present portrayal of Carnap will at certain points require supplementation from other Circle members, particularly Neurath, along the lines suggested by Thomas Uebel (2001).

the crude caricature of them prevalent in the literature. Even some of Carnap's closest interlocutors – including Ayer, Hempel, Popper, and Quine – misrepresented fundamental aspects of Carnap's mature view. Carnap, it will turn out, clearly anticipated the recent anti-modern (or 'post-modern') critiques, and took account of them; he had after all confronted many of the same Romantic, anti-modern ideas in Weimar Germany. He welcomed Kuhn's introduction of a historical dimension into the philosophy of science, and regarded it as complementary to his own work (Reisch 1991). Indeed, he himself published *The Structure of Scientific Revolutions* as part of the *Encyclopedia of Unified Science* he edited. And the famous 'two dogmas of empiricism' Quine attributed to Carnap in 1951 had in fact, as we will see, been decisively abandoned by Carnap two decades previously, in the early 1930s.

WHY IT MATTERS: OVERCOMING TWO BASIC OBSTACLES TO ENLIGHTENMENT

It would hardly be worth the trouble of excavating Carnap's ideas, though, if it were only a matter of correcting past misunderstandings, and presenting Carnap as a forerunner of present fashions. Much more is at stake. The conceptual framework he created is still the most promising instrument, I will argue, for the very purpose he invented it to serve, in the somewhat utopian Vienna Circle context of the 1920s and early 1930s: it is still the best basis for a comprehensive and internally consistent Enlightenment world view. It is still the best hope we have of addressing the fundamental obstacles facing any attempt to formulate a coherent position of Enlightenment today. Because two such obstacles in particular have dogged the Enlightenment from the beginning, and have often seemed utterly fatal to any revival of Enlightenment ideas since then, their exposition will provide a useful context for introducing some of Carnap's basic ideas.

First obstacle. What *is* the 'knowledge' that the Enlightenment regarded as so critical to individual autonomy and social improvement? Can it be defined, even loosely, for practical purposes? To begin with, what *qualifies* as knowledge? And then how does all the knowledge that qualifies fit together? (Should it be classified according to human cognitive capacities and activities, in the manner of Bacon, d'Alembert, or Comte? Or does knowledge cohere in a more structural and hierarchical system of categories, deduced 'logically', as claimed by Aristotle, Leibniz, or Kant?) Behind this latter question lay the further problem of what constituted *important* knowledge.

The paradigm of important knowledge for the original Enlightenment was Newton's *Principia*, but much else qualified as well. The role of the *Encyclopédie* was, after all, to expound the important knowledge, to organise it, display its interconnections, and draw attention (where this was possible without attracting censorship) to its implications for everyday life and widely held beliefs. But what *made* knowledge *admissible* to the *Encyclopédie*, and what gave some of it a particular *importance*? There was more agreement on the first question than on the second. What made knowledge *admissible*, all agreed, was its *empirical* character. Locke and Bacon were the most frequently cited authorities on the subject of what this empirical character consisted in. Locke's *Essay*, in particular, was regarded as spelling out the implicit epistemological programme of Newton's *Principia*.

But this very answer also made an answer to the other question (what makes some admissible knowledge *important*?) very difficult. For the very paradigm of 'important' knowledge, in Enlightenment eyes – the *Principia* (theoretical knowledge, that is, the sort Kant thought essential to science) – was also a kind of knowledge that Locke's empiricism could not account for. No amount of empirical knowledge, as Hume later argued, could add up to causal knowledge or knowledge of universal laws. Nor could the classificatory approach of the *Encyclopédie* explain the central importance of theoretical knowledge. Most worrying, for the empirical criterion, was mathematics, which played so large a role in theoretical knowledge, and was not based on observations at all. So here was an impasse at the very heart of the Enlightenment project.[10] John Stuart Mill's mid-nineteenth-century attempt to develop a resolute mathematical empiricism served only to highlight the inadequacy of this view, and called forth Frege's withering critique in the 1880s.

Second obstacle. Despite this difficulty in formulating an adequate criterion of knowledge, *scientific* (and especially theoretical) knowledge occupied an exemplary place in the Enlightenment canon. But this very exaltation of science exposed the Enlightenment to the *other* fundamental challenge it has faced: its apparent blindness to the moral and affective context of knowledge. One of the most effective rhetorical devices Romanticism deployed against the Enlightenment, from the outset, was its complaint that Newtonian optics had 'unwoven the rainbow'. If scientific knowledge, especially of the Newtonian kind, were to be given precedence, as the Enlightenment proposed, then – so the Romantics claimed – human relations with

[10] This impasse was, of course, addressed and in some ways overcome in Kant's critical philosophy. But in the century after Kant, as we shall see below, his main influence was in a direction quite contrary to the intentions of the Enlightenment in the sense discussed here.

nature, and with other humans, were robbed of their spontaneity and subjective authenticity. For giving such priority to science would degrade our subjective perceptions to the status of 'mere appearances', while impersonal scientific formulas specify the 'underlying reality'. The first generations of Romantics were anxious, therefore, to reinterpret science so as to minimise the scope of this implication. Science was to be restricted to what was directly and intuitively commensurate with human subjective experience (this was Goethe's scientific project, hugely influential in the nineteenth century). Other Romantics pursued the alternative strategy of trying to show that science applied only to a superficial, worldly reality, while human subjectivity had access to other, ideal realms of which science knew nothing. Though not designed explicitly to cater to this demand, Kant's distinction between 'understanding [*Verstand*]', the human rational faculty that we employ in creating and understanding science, and 'reason [*Vernunft*]', a broader kind of rationality that encompasses the moral, spiritual, and aesthetic (as well as *Verstand* as a subordinate part), was seized on by Romantics and Idealists and employed to portray the Enlightenment as having truncated human rationality to a merely scientific rump, and as having ignored everything of genuine human importance.

This portrayal was in a sense highly unfair. It is true that the 'importance' of knowledge to the original Enlightenment had been a largely cognitive matter, a measure of explanatory power or fecundity, of the wide range of intuitively unrelated phenomena that could be accounted for by a single, compactly presented equation. Newton's *Principia* was, again, paradigmatic. The motions of all the planets, the phases of the moon and its trajectory through the sky, the rotation of the earth, the seasons, the tides, the flatness of the poles could all be precisely deduced from the law of gravitation (in conjunction with Newton's three laws of motion). No other branch of knowledge had ever been able to offer such pregnant, such 'teeming' truths, as Locke had put it.[11] And yet not only Locke, but the *Encyclopédistes* themselves, were willing to grant 'importance' to many other kinds of admissible knowledge, including literary, artistic, and moral

[11] Locke gives two examples for the 'teeming truths' that, 'like the lights of heaven, are not only beautiful in themselves, but give light and evidence to other things that without them could not be seen or known'. The first is 'the discovery of Mr. Newton, that all bodies gravitate to one another, which may be counted as the basis of natural philosophy'; the second is 'our Saviours great rule, that *we should love our neighbor as ourselves*' – by this rule alone, Locke says, he thinks 'one might without difficulty determine all the cases and doubts in social morality'. This passage from Locke's posthumously published treatise *The Conduct of the Understanding* is quoted by Howard Stein (1993), p. 196; as Stein points out, according to the 'official' doctrine of the *Essay*, morality, unlike natural philosophy, *is* capable of being made a science, so this late passage represents a major step toward admitting natural philosophy to an equal status.