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principally around constructivism (ranging from feminism, new social movement and risk theory, finalization theory, autopoiesis and systems theory) and critical realism. It will be argued that constructivism and critical realism share a common concern with the idea of a critical social science.

Chapter 7 attempts to access the contemporary situation of social science in light of the constructivist debate. It is argued that science and democracy are the two great value systems of modernity and can be brought together around a notion of critical social science as discursive practice.

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Positivism, Science and the Politics of Knowledge

Introduction: defining positivism

Philosophical debates on the methodology and self-understanding of social science have been, for the greater part, shaped by the positivist dispute. Therefore a good place to begin is with positivism itself. This will inevitably involve looking at disputes on the meaning of science more generally, since positivism, broadly understood, is a philosophy that argues for the application of the methods of the natural sciences to the social sciences and thereby presupposes the unity of the sciences. Underlying positivism more fundamentally is the naturalistic notion that science is the study of an objectively existing reality that lies outside the discourse of science.

Positivism has been under attack throughout the twentieth century from a variety of different standpoints. It is customary to contrast positivism to hermeneutical or interpretative social science, or to the more Marxist-inspired, critical social science, but positivism, which makes certain assumptions about the nature of natural science, has also been undermined by developments within natural science itself, which cannot be considered positivistic. Thus positivism, in both natural and social sciences, has been very much in question, particularly since the 1950s.

Firstly let us be clear on exactly what positivism is. In the most general terms positivism can be defined by the following five tenets, which, for the purpose of illustration, may be somewhat stylized:

- 1 *Scientism or the unity of the scientific method.* For positivism, there is no essential difference between the methods of natural science and social science. In arguing for the unity of the scientific method, the natural sciences are generally taken to be the model for all the sciences. This entails scientism: the view that the meaning of knowledge is defined by naturalistic science alone.
- 2 *Naturalism or phenomenalism.* Not only is there a unity of method, but there is also a unity in the subject matter of science. Science is the study of reality, which is external to science itself. This reality can be reduced to observable units or naturalistic phenomena. Positivistic naturalism generally entails (a) reductionism or atomism (that everything can be reduced to atomic units), (b) a correspondence theory of truth (that there is a correspondence between the truths of science and the nature of reality) and (c) phenomenalism or objectivism (an objectifying attitude to nature by which nature is seen as existing outside science and can be neutrally observed).
- 3 *Empiricism.* The foundation of science is observation. Positivistic science is based entirely on that which is positively given to experience, in other words only that which can be subject to observation and verification. For positivists progress is made from observation to verification by means of the experimental method: the scientist carries out experiments in order to uncover objectively existing, general laws from which hypotheses can be made that can be used to predict what can happen. In general, the kinds of laws positivism seeks to uncover are causal laws and have the power of explanation.
- 4 *Value freedom.* Science does not make judgements on its subject matter; it is a neutral activity free of social and ethical values. Positivists therefore insist on a dualism of facts and values. Values, it is claimed, cannot be derived from facts. For positivistic social science there are only social facts, which can be examined. Positivism involves a commitment to the pursuit of scientific truth, which is arrived at independently of ethical self-reflection or personal subjective elements since truth is a verifiable and explanatory statement about an objectively existing reality. Thus scientific knowledge is different from all other kinds of human knowledge since it can be verified and therefore can be said to be universally true.

- 5 *Instrumental knowledge.* In general the institution of science as a profession in modern society has favoured the pursuit of technically useful knowledge, although this can take a variety of political forms. Positivism has taken three political forms: (a) the classical positivistic ideology of scientific politics, as represented by Henri Saint-Simon and Auguste Comte and by scientific socialists; (b) science as instrumentally useful knowledge but without overt political significance, as represented by reform movements particularly in Britain and the USA; and (c) instrumental, bureaucratic social science associated with the professionalization of social science in the twentieth century. In the case of (c), which proclaims itself to be unpolitical, critics such as C. Wright Mills (1970) argue that the political nature of positivistic empirical research is disguised by its claims to scientific objectivity.

It is important to appreciate, as this chapter will illustrate, that not all of these criteria were embodied in any one positivist philosophy or scientific practice. Positivism, strictly speaking, in its classic form, was largely a nineteenth-century French ideology of the unity of scientific method, which was held to have a radical political mission. Thus 'positive science' and the 'positive polity' formed a unity. This conception of positivism is best associated with Saint-Simon and Comte. A second form it took was the more formalistic social science of the Vienna Circle, where the idea of the positive polity was abandoned in favour of the purity of science. Aside from these two classical forms positivism is often, thirdly, used to describe, in somewhat disparaging terms, modern, empirical social science in general.

In what follows I shall outline the changing forms that positivism took from the New Learning of the late Renaissance, through seventeenth-century rationalism and empiricism, Enlightenment thinking, and the emergence of modern social science in the nineteenth century to, finally, its twentieth-century proponents and critics. Though often criticized for being a conservative doctrine asserting the superiority of science over other forms of knowledge and driven by a relentless instrumental rationality striving to gain intellectual mastery over nature and society, positivism, along with empirical science, has historically, in fact, been related to liberalism, and its changing forms have reflected the transformation of

liberalism from early modern anti-authoritarianism and anti-obscurantism, through Enlightenment radicalism, to liberal reformism and the rise of the modern state and its need for instrumental knowledge. While positivism can also be seen as related to the rise of the modern state and science as an institution, in general positivists and empiricists have been liberals, ranging from John Locke (who was a Whig critic of Stuart absolutism), through the enlightened reconstructionism of Condorcet (who was an *ancien régime* official), the scientific utopianism of Comte, and the reformism of John Stuart Mill and Herbert Spencer to the anti-obscurantist radicalism of the Vienna Circle and the Marxism of Otto Neurath. Any account of positivism will have to take account of the rise, transformation and decline of liberalism. In the twentieth century the most important development in positivism was the decline in the culture of the intellectual and the rise in the culture of the professional and institutionalized expert systems.

The rise of modern science as a cognitive system and institution

Positivism is primarily a nineteenth-century post-Enlightenment ideology, but its roots lie deep in western culture. The pursuit of scientific truth as an absolute form of knowledge can be traced back to Plato's philosophy, which argued that the highest kind of knowledge that can be aspired to is the pure contemplation of the natural forms of the cosmos. The Platonic conception of knowledge has had an enduring appeal throughout the history of philosophy, bequeathing a legacy of rationalistic inquiry in the quest for objective truth. This survived through antiquity and the Middle Ages in Aristotelian philosophy and Christian metaphysics, which posited as the aims of human inquiry the study of the natural laws of the universe and the search for first principles.

Although Aristotle was responsible for the emphasis on first principles, he had earlier established the basis of an empirical inductive science in his *Politics* which stressed not the quest for absolute ideals, but a classification of empirically observable phenomena into categories, such as his famous classification of the three kinds of states: monarchies, aristocracies and democracies. In his *Posterior Analytics*, Aristotle provided the foundations of

modern inductive and deductive methodology: knowledge progresses inductively from observation of facts to general explanatory principles from which reasons can be deduced to explain the specific facts. Aristotle, however, gained influence in medieval scholasticism only since the thirteenth century, when the dominant conception of knowledge, which lasted until the advent of the Scientific Revolution, was a Christianized version of Aristotelianism known as scholasticism, developed by St Thomas Aquinas. Aristotelianism degenerated from a concern with the inductive-deductive approach to an emphasis on first principles. With the rejection of scholasticism, Aristotelianism fell into disrepute.

Positivism in the sense of modern rationalism did not emerge until the development of the experimental method in the Renaissance, which witnessed the Scientific Revolution and the rise of rationalism. While Platonic epistemology (or theory of knowledge) was metaphysical and idealistic (oriented towards the pursuit of transcendental realities, or 'ideals', to be uncovered by philosophical knowledge), modern positivism was empirical: based on the observation of reality with the help of experimental science. Platonic knowledge, in contrast, rejected knowledge derived from sense experience as being inferior to knowledge of the 'eternal forms'. Despite being post-metaphysical and anti-idealist, positivism can be seen as a continuation of the Platonic quest for truth and objective knowledge.

An early exponent of positivism was the thirteenth-century predecessor of the Renaissance, Roger Bacon, who stressed the importance of observable data as the basis of knowledge, and William of Ockham, who also argued that knowledge must proceed in a 'razor' like manner from an examination of empirical cases in order to exclude the superfluous. Thus evolved the notion of 'Ockham's Razor', which states that the simplest explanation is to be preferred. From the Renaissance thinkers and scientists, such as Leonardo da Vinci to those of the sixteenth and seventeenth centuries, such as Giordano Bruno, Galileo Galilei, Desiderius Erasmus, Michel de Montaigne, Robert Boyle, Johannes Kepler, Nicolas Copernicus, Francis Bacon and Isaac Newton, the experimental method developed along with the progress of modern science.

The experimental method was epitomized in the writings of Francis Bacon, who advanced an inductive methodology of observation without philosophical presuppositions: theory is arrived at from

presuppositionless observation and not the other way around. The Renaissance artists, but most of all Leonardo da Vinci, gave expression to the new consciousness by evolving new techniques in the representation of reality that allowed the object to appear in its natural form. The scientists, such as Galileo, replaced the principle of clerical authority with the experimental method, which was to be the demarcation of science from non-science. In this way, modern science began with a gradual attack on clerical authority, which asserted that knowledge derives from the ancient authority of the Church. This attack, however, it must also be pointed out, was more implicit than outright, for the Renaissance thinkers were not always anti-Christian; many such as Thomas More and Erasmus sought to reconcile their ideas to the prevailing Catholicism, and the seventeenth-century pietistic proponents of rationalism, such as Francis Bacon, were also ardent Protestant reformers who argued for a separation of divine laws from natural laws in order to make science possible. In this way the Reformation greatly facilitated the rise of modern science, since it gave theological justification to the freedom of science, which could also be used to provide justifications for the existence of God. This was the 'paradox of modernity' that Weber believed marked the entry of the modern age. This paradox can be explained by the fact that both the pietistic Reformation and rationalistic science were expressions of the modern turn to radical subjectivity that brought about the de-centring of consciousness and established the self-confidence of the individual as the bearer of knowledge.

By the mid-seventeenth century rationalism had finally replaced Aristotelian scholasticism and the Platonic legacy of metaphysics as well as the unitary Christian world-view of the Middle Ages. Modern rationalism was born in the de-centring of consciousness from the divinely ordained laws of the universe to those that modern science is capable of uncovering. Classic statements of the new spirit of rationalism were Copernicus's *De Revolutionibus Orbium Coelestium* [1543], Francis Bacon's *Novum Organum* [1620], René Descartes's *Discourse on Method* [1637], Newton's *Mathematical Principles of Natural Philosophy* [1687]. As Stephen Toulmin (1992) has argued, the seventeenth-century quest for certainty must be seen in the context of the Thirty Years War, which plunged Europe into war fought over religious doctrine and political legitimacy. Rationalism was an attempt to find a certain

basis for knowledge, beyond clerical-autocratic dogma. Objective and presuppositionless observation was a means of emancipation from the past and from myth and metaphysics.

The New Learning, or New Science, of the Scientific Revolution and the pietistic humanism of the Reformation period was accompanied by programmes for radical social reform, of which More's *Utopia* [1516] was a famous example, and one that can be read as one of the first works on modern social policy. The provision of health care, universal education and the abolition of poverty were among the aims of new conception of a utopian polity and were also central to the Baconian reform movement. Francis Bacon himself wrote about the advancement of learning and defended the intellectual resistance of science against the canons of antiquity (such as Aristotle, Ptolemy and Thomas Aquinas) and, like More, wrote one of the early utopias: *New Atlantis* [1627]. Other examples of early social utopias are James Harrington's *Oceana* [1656] and Campanella's *City of the Sun* [1602]. The New Learning was not then only about philosophical arguments; it was also about the emancipation of knowledge from the old monopolies exercised by the corporate professions in the universities. The movement can be described as an early Enlightenment, for it strove to further the cause of universal enlightenment through knowledge emancipated from the past. Creative or constructivist utopianism was part of the early conceptions of science. This period, too, saw the emergence of radical scientific currents (such as Paracelsian physicians, alchemists, mystical-hermetic thinkers and magic) from outside the mainstream New Learning, which were later suppressed with the institutionalization of science by the absolute state (van den Daele 1977: 32-3).

It is important to see that modern science emerges at a time when the institutions of the Middle Ages, such as the Church, the universities and the established professions of jurisprudence, theology and medicine, were collapsing but when the social and political order of modern society had not yet consolidated. It was in this period of transition and upheaval that modern science emerges as part of a project of social reconstruction. Of course the distinctions between the modern disciplines had not been clarified; more significantly, the distinctions *between* the sciences were not strongly pronounced. Modern natural experimental science begins as anti-authoritarian, progressive, anti-elitist and based on a

programme of educational and social reform. The New Learning, accelerated by the Puritan reform movement (Hill 1988), implied nothing less than social reconstruction involving the universal availability of knowledge and its employment for the public good (van den Daele 1977: 36). The radicals of the English Revolution wanted to end the dominance of Greek and Latin and to drive the scholastic theologians out of the universities. Such radicals as Gerrard Winstanley and the Levellers wanted to end the distinction between lay and professional knowledge by enlisting science in the democratization of society. The connection between science and its public commitment to society was firmly established in the formative period of modern science and cannot be explained by the notion of positivism, which was a later development. We can say, then, that modern science in its formative period involved the creation of a new cognitive system (or system of knowledge), which sought to link scientific knowledge to social and political goals.

However, this was all to change by the late seventeenth century when the Age of Absolutism reaches its zenith. In England the Restoration in 1660 marked the end of radical science and the association of science with social reconstruction. The Restoration government purged the reformed universities of the adherents of the new experimental natural philosophy and re-established the authority of the Church and state censorship. In this period the institutionalization of science under the auspices of the absolute state and its mercantilist economy commences. This was marked by the foundation of the Royal Society in London in 1662 by Charles II and the *Académie des Sciences* in Paris in 1666 by Louis XIV (van den Daele 1977: 29). In France science in the *ancien régime* had an institutional role since the foundation of the *Académie Française* in 1635, but one subordinate to the court (Heilbron 1995). By the end of the century this state control was much strengthened. The political incorporation of science by royal edicts into the state compromised its radical function, which henceforth became one of social administration led by expert systems. At about this time alternative challenges to modern experimental science, such as hermeticism, had all but disappeared and a state sponsored positivistic Baconism became the dominant framework for science. The consequence of these developments was that the possibility of a radical social science, the first intimations of which were in the utopias of More and Francis Bacon, was aborted and natural

science underwent its own path of development as an autonomous expert system linked to the administrative state. In place of social science, literature, in particular in England since the Restoration, took over the role of social science. The relationship between knowledge and its public utility fell apart. It was in this spirit of the differentiation of the sciences that modern rationalism developed: the subversive elements and the project of social reconstruction were abandoned and became the concern of intellectuals who were isolated from the culture of science and a depoliticized cultural humanism flourished in the universities. The incorporation of science into the state apparatus and the suppression of alternative forms of knowledge occurred at a time when the modern university system had not yet emerged as an institution capable of sustaining a permanent structure of social scientific knowledge.

Rationalism, empiricism and the Enlightenment

Beginning with the sceptical humanism of writers such as Erasmus and de Montaigne, rationalism reached its apogée in the Cartesian method of Descartes, who established the foundation of a rationalistic conception of science as the search for absolute truths based on first principles. The Cartesian method consists of a belief in the certainties of the 'clear and distinct perceptions' of the solitary individual sceptically contemplating an external reality. Everything else is to be treated with scepticism. For Descartes the path to certain knowledge consists in putting everything into doubt so that only those things that can be clearly and distinctively perceived remain. Knowledge thus consists of the pure objects of reason and presupposes psychologism or solipsism: reason is a property of the psychology of the mind of the individual and can in principle be practised by anyone who casts systematic doubt on the objects perceived by the mind.

The Cartesian method exemplified the spirit of modern rationalism but did not quite encapsulate the core tenets of positivism, which was closer to the doctrine of empiricism. It was a precursor of positivism in that it established that the demarcation between rational knowledge (knowledge of what is true) and false knowledge is determined by the sceptical power of the mind. Cartesian dualism also laid the basis of one of the tenets of modernity: the dualism of body and mind, spirit and nature, mind and matter. This

distinction, which parallels the bifurcation of the sciences, stipulated an absolute demarcation between knowledge of the world of nature and the subjective world of society and its psychological constructions.

While Descartes had established the foundation of true knowledge to be the inquiring and sceptical power of the mind, positivism has been mostly inductive rather than deductive. Descartes advocated a deductive approach from first principles, while most empiricists argue for an inductive approach: observing data and conducting experiments can lead us to general laws. In other words, Descartes was able to conduct the quest for knowledge seated by the fireside, simply by proceeding from the universal to the particular, while the empiricists (such as Newton and Francis Bacon) advocated the gathering of observable data in order to see what universal laws they revealed. The main difference between rationalists and empiricists is that the former regard knowledge as depending on a priori logical structures while the latter emphasize sensory perception, or experience, as the criterion of valid knowledge.

Two of the classical exponents of empiricism were Thomas Hobbes and Locke. It is important to see a difference between Cartesian rationalism and English empiricism. The latter is more illustrative of positivism in the conventional sense of the word. According to Hobbes in his famous *Leviathan* [1651], which can be said to have laid the foundations of modern political science, scientific knowledge is based on the search for causal laws. The data the scientist examines are meaningful only as laws. One of the laws for which Hobbes is famous is the principle of methodological individualism, which was the basis of his political theory, and became the foundation of modern liberalism, influencing in particular the disciplines of politics, economics and psychology. This law claimed that social action can be explained by the behaviour of isolated individuals, the sum of whose action is society. Society is thus reduced to the behaviour, in Hobbes quite literally, of the psychological motives of rationally acting individuals seeking to realize their interests. Locke was also an exponent of empiricism. His *Essay Concerning Human Understanding* [1690] argued for a common sense theory of knowledge in which science severs all connections with religion. The sole criterion for valid knowledge is determined by sensory experience. This view must be seen in the

context of its time, for in effect it amounts to a defence of the democratic nature of knowledge against clerical and state censorship: all human beings can have access to scientific knowledge, which cannot be reduced to the pronouncements of clerical or political elites. Locke's empiricism was a liberal and anti-dogmatic conception of science: valid knowledge is that which can be put to the test of experience. In this sense, both rationalism and empiricism were expressions of the turn to radical subjectivity, which characterized the modern world-view.

In embracing rationalism and empiricism, the philosophers of the sixteenth and seventeenth centuries brought about a major revolution in the conception of science. However, rationalism and empiricism in this period did not automatically imply a genuinely modern understanding of science. In the case of George Berkeley, empiricism was a critique of science and defended theocratic ideas and Descartes believed it was incumbent on him to provide proof of the existence of God. The modern scientific outlook did not occur until the eighteenth century in the period known as the Enlightenment, when many of the earlier ideas were radicalized.

From the mid-eighteenth century several schools of thought developed around the leitmotif of reason. The philosophers of the Scottish Enlightenment, in particular David Hume and Adam Smith, were important figures in the history of modern social science. In his three volume *A Treatise of Human Nature* [1739 and 1740] and the later *Enquiry Concerning Human Understanding* [1748], Hume advocated an extreme scepticism, which brought empiricism beyond the limits of natural laws to which it had previously been bound. He defended Locke's empiricism to the extent that all knowledge derives from sensory experience but drew different conclusions. The empiricism of Locke was reconciled with a belief in the natural laws of morality ('life, liberty and property'), but for Hume scepticism must be extended to everything, including science itself. Thus the knowledge science produces is an uncertain knowledge and can undermine itself. Hume thus not only rejects the deductive rationalism of Descartes, but also casts doubt on the inductive approach of Lockian empiricism. Hume argues that our knowledge derives from the actual forms of our mental perception and may not therefore correspond to an objective reality. His objection to induction was that we cannot generalize from cases of which we have experience to those that are unknown to us. In this

way Hume questions the correspondence theory of truth characteristic of much of rationalism.

Another enduring legacy of Hume was his argument that the realm of facts and the sphere of values cannot be crossed: we cannot infer values from facts. Hume's importance for the social sciences is evident in his rejection of the methodological individualism of Hobbes. Like many thinkers of the age, such as Giambattista Vico, in his cyclical theory of history, Charles Montesquieu, in his quest for the 'spirit of the laws', or Jean Rousseau, who demonstrated that equality is social and not natural, Hume offered an essentially social view of human action that cannot be reduced to Hobbes's methodological individualism and its model of self-interest. His approach can be contrasted to the epistemological individualism of Locke and Descartes for whom nothing social enters questions concerning the nature of knowledge (Manicas 1987: 11/12). Hume's social view of human beings was reflected in his attempt to find general laws of human nature that demonstrate that society is more than the sum of its parts. A famous example of this was the work of Hume's contemporary, Smith, who wrote *An Inquiry into the Nature and Causes of the Wealth of Nations* [1776], a work that exhibited the experimental method and empiricism advocated by Hume and became a classic example of the new moral sciences.

Scotland played a leading role in the formation of modern social science, which flourished in the secular universities. In France the Enlightenment emerged out of the court society and developed in the rapidly developing civil society, which provided new spaces for public discourse. The rationalism of the Enlightenment was characterized by a strong attack on religion, with the *philosophes* such as François Voltaire and Paul D'Holbach and the *encyclopédistes* such as Denis Diderot engaging in empiricist tirades against theology. While many of these salon intellectuals, took the individual as the cornerstone of knowledge, others began from the perspective of society. From a positivistic outlook, the physiocrats, who were a group of political economists including François Quesnay, represented the view that society is determined by laws similar to those operative in nature.

Rousseau and Montesquieu had a stronger concept of society as the object of study *sui generis*. Rousseau was one of the first to use the word 'society', as in *The Social Contract* [1762] as a key concept, although an earlier use of the word goes back to Thomas More's

Utopia [1516]. With the Enlightenment intellectuals, society as 'civil society' is seen as a sovereign domain autonomous of the state, which was still absolutist. It was fateful for the subsequent history of social science that this sense of society as a domain against the state was subordinated to a conception of science that reflected a statist view. 'Social science' was a term that was coined by Condorcet in the initial stages of the French Revolution and introduced to the English language via his writings (Heilbron 1995: 110). Social science, which replaced the older idea of moral science, rapidly became conceived as an area of state reform policy, associated with the reform politics of A. R. J. Turgot, and was institutionally modelled on the natural sciences, in particular mathematics. As a positivistic inquiry, social science first developed in France during the Restoration after the fall of Napoleon, who had supported the natural sciences, and it was very much in the spirit of the natural sciences that the social sciences became institutionalized as a state-centred knowledge culture in France. Positivism became associated with 'useful' or technically exploitable knowledge for the purpose of social engineering by the administrators of the state. This was the sense Comte used for the methodology of 'sociology', a term he coined, to describe the science of industrial society. The social precondition of social science as positivistic inquiry was the administrative modern state, which required the systematization and coding of knowledge. Social science as a positivistic institution thus became tied to policy making and state administration. Moreover, the beginnings of national differences in the conception of science began to emerge from the 1790s onwards.

Against this tradition, which equated scientific knowledge with natural science and the needs of the state for a form of knowledge to be used in social administration, the intellectuals of the Enlightenment stood for a more radical kind of knowledge that could be used in programmes of social reconstruction. This conception of science can be seen as the continuation of the original ambitions of the New Learning and had a major role to play in the formation of social science. The Enlightenment writers did not simply glorify science for its own sake but were critical of the intolerance of the French state and its knowledge politics. During the Revolutionary period there was the possibility that an emancipatory new science of social reconstruction might emerge, but this hope was shattered by the aftermath of the Revolution with the formation of the modern

French state. Both under the absolute *ancien régime* and the modern post-Revolutionary state, the Enlightenment was isolated from institutionalized science, which was forced to retreat from a political role, and was thereby compelled to take up an oppositional position. This oppositional role had a major role in the formation of social science as a form of normative and critical reflection on society. Thus, from the beginning of the modern period, social science was divided between occupying an institutional role as part of the state apparatus and being an extra-institutional discourse. Until social science became institutionalized in the universities from the late nineteenth century it remained bifurcated between intellectual critical culture and expert systems. The former largely existed in the literary public sphere and the latter within the institutions of the state.

This bifurcation was not always an impediment to the formation of a mature social science. Wolfgang Lepenies (1988) writes of the borrowing of social science, in particular sociology, from literature, which in the Enlightenment period had a social role. Honoré de Balzac, for instance, first intended to call his work, not *Comédie Humaine* but *Etudes Sociales*. Emile Zola spoke of a '*sociologie pratique*', and with Gustave Flaubert literature and social critique were indistinguishable. According to Lepenies, sociology emerged as a 'third culture' between natural science, on the one side, and literature and the humanities on the other. Isolated from the official expert culture fostered by the state, sociology found itself with not only natural science as a rival but also literature. Fearing that association with literature might ruin its aspiration to scientific status, sociology preferred to model itself on the natural sciences rather than on literature and the humanities, from which it distanced itself. This was exacerbated by the fact that on the whole the counter-Enlightenment was allied on the side of a literary social science, with reactionary and romantic thinkers looking more to literature than science for an orientation for social science. In England, where since the Restoration the educational establishment lay greater stress on literature than on science, social science was often equated with literature, as is evidenced by the literary-social scientific writings of Matthew Arnold, H. G. Wells, D. H. Lawrence and Julian Huxley. In Germany, the circle around the poet Stefan George had an important role in the shaping of sociology. Georg Simmel, for instance, was a mediator between

science and literature, and Weber was influenced by the romantics, but was critical of romantic quests of poets aspiring to scientific knowledge. Even American empirical sociology was not untouched by literature: Robert Lynd, one of the principal figures of the Chicago School, was influenced by the writings of Lawrence, whose theme also was the impact of modern industrialism on traditional communities (Lepenies 1988: 186).

The foundation of the modern university system in the nineteenth century opened up new possibilities for social science to develop as a competing form of knowledge to both natural science and literature.

The emergence of nineteenth-century positivism

The classic proponent of positivism was Comte, who also coined the word 'sociology'. In his *Course of Positive Philosophy* [1830–42] he outlined the basic ideas of positivism. For Comte, 'positive' science was useful and certain knowledge and a contrast to imaginary knowledge in its reliance on empirical methodology. With Comte, empiricism in the tradition from Locke to Hume is transformed from pure epistemology to the actual practice of empirical methodology. Knowledge no longer has to prove itself merely through a critique of sensory perception, but must submit itself before methodological investigation: there can be no truth without observation. The empirical henceforth refers to the domain of objectively existing facts and science is the observation of those facts. With the identification of the empirical with the factual, rationality too shifts from the epistemological to the scientific and becomes equated with methodology. In this way Comtean positivism inherits the traditions of empiricism and rationalism. While for Condorcet social science was modelled on mathematics, for Comte it was to be modelled on physics; it was to be a value free, explanatory, descriptive and comparative science of general social laws. The themes that defined social science were those of stability and change: 'statics' was the study of social stability and 'dynamics' the study of change or evolution. This concern with stability and change can be seen in the context of the aftermath of the French Revolution and the overthrow of the Bourbon monarchy in 1830, events that shaped Comte's thought. As a reformer Comte was, like most liberals, not a revolutionary and feared social disorder, but did not

stand for Restoration reactionism. This experience with crisis led him to believe that social order was the natural condition of society. For sociology this had the consequence that it became more concerned with the question of order than of change.

Social science or 'social physics' thus began its uncertain career in the mirror image of natural science and came to be the expression of modernity itself. The doctrine of positivism was outlined in the context of a philosophy of history that Comte, under the influence of the industrial utopianism of Saint-Simon, developed from Turgot. The basic idea was that the evolution of human society through the ages culminated in the modern epoch of positivism in which science was itself the secular spiritualism of industrial society. In this Comtean world-view, positivism was the highest expression of scientism: the idea that the Republic of Science, which alone has access to true and objective knowledge, can provide political and moral leadership for society.

In Britain, positivism was reflected in the writings of the Victorian utilitarians, such as Mill, and in the rise of social evolutionism as represented in the thought of Spencer. Mill, however, was greatly influenced by Comte, about whom he wrote a book in 1865. In his *A System of Logic* [1843] he defended empiricism as an inductive science of general causal laws. While recognizing differences between the study of nature and the study of society, he stood for the unity of the scientific method. Mill was very critical of the idea of scientific politics and stood for a model of useful knowledge. The principal difference between French and British positivism was that in Britain science was not itself seen as capable of providing political leadership. This was a reflection of the fact that while England had taken the lead in science in the seventeenth century, the centre of gravity shifted to France, as was to be the case in the following century when it once again shifted to Germany. The Victorians tended to link science to the idea of moral improvement. Sociology was, from the beginning, caught in the bind between the positivistic heritage of moralistic reformism and administrative knowledge.

For Mill, all explanations have the same logical structure and society can be explained by the laws governing nature. More important for social science was Spencer, who helped to popularize the word 'sociology' in England as a new science of society based on the method of the natural sciences. While Comtean positivism tied

social science to physics, Spencer took biology as the paradigmatic science. Under the influence of Charles Darwin, Spencer developed a functionalist–evolutionary social science, which had considerable impact on the subsequent history of the social sciences. The basic ideas of this approach are that social structures are explained in terms of the functions they perform and social change is the result of functional adaptation. His *Social Statics* [1850] clearly shows the influence of Comte and a concern with social order typical of Victorian social thought. Spencer also linked theory construction to empirical analysis, compiling vast quantities of data for the building of general theory. Darwin himself was influenced by Spencer, who formulated the notion of 'the survival of the fittest', a term that found its most famous expression in *On the Origin of Species by Means of Natural Selection* [1859].

Comte's influence in shaping the positivist self-understanding of the social sciences extended largely through Spencer in England and Durkheim in France, who both established the foundations of modern empirical sociology and functionalist theory. Durkheim's conception of social sciences was set out in 1895 in the *Rules for the Sociological Method*, which argued for a model of social science very much based on natural science, but that discarded the philosophy of history. His approach was also opposed to psychologism, the attempt to explain society by reference to the consciousness of the individual. Society for Durkheim is a reality in itself and sociology is a realist and inductive science of social facts. The object domain of social science is a reality that is composed of facts and laws between those facts. All of social reality can be broken down into facts and analysed in specific case studies, of which Durkheim was the first major modern exponent. His approach was an anti-naturalist realism since he held that social facts were different from natural facts. Social facts differ from natural facts in that they are social representations, but they are none the less facts and can be examined without recourse to prior theoretical constructions. While facts are the raw data, the aim of social science is the search for causal laws. Theory for Durkheim is subsequent to observation, which proceeds inductively from facts through hypotheses to general causal laws. These general laws are conceived in terms of their functions: social phenomena are explained by their social functions. Durkheim insisted on the priority of causality as the proper subject matter of sociology.

Politically a liberal reformer and a believer in modern liberal individualism, Durkheim was no radical and feared the breakdown of French society, which was threatened not only by the spectre of the Paris Commune and the Dreyfus Affair but also by German aggression, as witnessed by the Franco-Prussian war. His conception of social science was a conservative one in that it stressed social cohesion through cultural consensus as the normal condition of society and social change was identified with disorder or dysfunction. The role of the social scientist was confined to the neutral observation of an objectively existing reality, over which he or she had no control.

Functionalism combined with empirical social science had its most important success in North American universities, where social science as a profession was established rapidly from the late nineteenth century onwards, culminating in the Chicago School, which was the leading school in sociology in the 1920s. While the research of the Chicago School went beyond positivism, embracing, for instance, under the influence of Simmel social interactionism, its self-understanding was radical social criticism. Pragmatism was an important influence in the Chicago School (Joas 1993). Works such as John Dewey's *The Public and its Problems* [1927] were important in mediating empirical research and theory. One of Dewey's concerns was the link between democracy and knowledge, a relationship that he believed must be rescued by a policy oriented science. American pragmatism exemplified a tradition of social science that was characterized by the priority of positivistic empirical research with theory serving an applied role. Thus empirical micro-case studies using statistical methodology became the hallmark of American sociology. However, research was guided more by government policy and social administration than by intellectual critique. In time the influence of pragmatism declined.

Existing somewhat uneasily alongside of empirical sociology was the more theoretical sociology of Merton and Parsons, which had also inherited the positivistic conception of social science as value-free inquiry. The Parsonian conception of social science can be seen as the expression of the core values of America society – liberal democratic consensus within the egalitarian market structures of capitalism – and as an historical alternative to European fascism and communism. Functionalism and positivism became

closely linked in the combination of quantitative empirical research within an evolutionary conception of society based on modernization and functionalist theory. Paul F. Lazarsfeld's sociology is an example of the use of a mathematically based empirical social science, which co-operated with the functionalism of Merton and Parsons.

The positivistic conception of science, I have suggested, has traditionally been linked to liberal reformism, if not radicalism, reacting to historical crisis. The great historical crises that marked the path of modern positivistic and rationalistic science were the 'general crisis' of the seventeenth century, the French Revolution and its aftermath, and the First World War and the rise of fascism. The last provided the context for the return to an extreme form of positivism in the 1920s, when many intellectuals of a liberal and left disposition (such as Ernst Mach, Moritz Schlick, Carl Hempel and Otto Neurath) reacted to the anarchy of ideology as well as obscurantist metaphysics, which were creeping into academia in the period preceding and following the war. The 'logical positivism' of the Vienna Circle demanded a conception of science based on the natural sciences, in particular physics, which was to be the model for all the sciences.

Logical positivism was inspired by the new developments in physics, such as Albert Einstein's theory of relativity and quantum mechanics, and stood for the ideal of a unified science based on the certain knowledge of mathematical logic. A second influence was linguistics. One of the key ideas was that there are only two kinds of knowledge: empirical knowledge (knowledge derived from experience) and logical knowledge (which is derived from logical analysis). Mach offered one of the classic formulations of logical positivism as the methodological objectification of reality in the analysis of laws governing facts. Rudolf Carnap's *The Logical Structure of the World* [1928] became one of the enduring treatises of logical positivism. Undoubtedly the most famous statement of the school was Ludwig Wittgenstein's correspondence theory of truth in the *Tractatus Logico-philosophicus* [1922], a work that Wittgenstein later refuted when he moved towards a relationist theory of truth. Logical positivism radicalized this view by proposing that the only valid kind of knowledge is observable and verifiable knowledge. Neurath, himself a Marxist, applied logical

positivism to sociology in his advocacy of a 'physicalist' science of society. Hempel likewise applied logical positivism to history in the search for general historical laws that could be used for predictions: explanations must have the power of prediction. This school was very influential in Anglo-American conceptions of science, such as the realist and analytical traditions associated with Bertrand Russell, A. J. Ayer, Ernest Nagel, Gilbert Ryle and William Quine.

The break-up of positivism: Popper and Kuhn

In the inter-wars years positivism appeared to be the dominant influence in the philosophy of science. Logical positivism and professional empirical social science were in ascendancy since the death of Durkheim, and it seemed that only Weberian sociology (to be considered in Chapter 2) was capable of offering an alternative.

The critique of positivism can be viewed from two angles. One angle is to trace the revolt of the social sciences against the hegemony of the natural sciences. This involves looking at the hermeneutical-interpretative revolt from the neo-Kantians to Weber and modern hermeneutics (the subject of Chapter 2), and the Marxist and critical theory revolt from Marx through the Frankfurt School to neo-Marxism (the subject of Chapter 3). The other angle is to look at the internal undermining of positivism from such developments as Quine's critique, to the revival of Science and Technology Studies (STS) and the Sociology of Scientific Knowledge (SSK). This will involve shifting the perspective to the philosophy of science more generally for positivism has not been merely attacked by social science: it has been far more pervasively and effectively criticized by modern conceptions of natural science itself that have sought to rescue realism from positivism. Ironically, then, the result is that many positivists operating in the social sciences hold to a conception of science that has been abandoned by modern natural science itself. One of the most important early developments in the internal breakdown of positivism was the Duhem-Quine thesis of the underdetermination of scientific theories by evidence. Quine had established a relationist theory of truth and the indeterminacy of reference, which undermined the inductionist and foundationalist basis of classical positivism. For Quine, truth is a function of the relationship between words, and not of the correspondence between words and reality. The idea of

theory dependency in observation was confirmed in work as diverse as Jules Poincaré, Einstein, Popper, Kuhn and Toulmin (1953).

In the remainder of this chapter I shall confine the discussion to the most important critics of positivism who are writing from the perspective of the philosophy of science, namely Popper and Kuhn. (The implications of STS and SSK will not be taken up until Chapter 6.)

Popper's theory of science can be viewed as a critique of positivism, in particular of logical positivism, which he aimed to refute, but his was a critique that did not abandon all aspects of positivism. For critics of positivism as a methodology of science, positivism in its inductive empiricist form is unable to explain the principled rejection of evidence. In *The Logic of Scientific Discovery* (1959 [1934]) Popper outlined the basic tenets of the method he advocated, critical rationalism. The main thesis in this revolutionary work in the philosophy of science is that the principle of verification must be replaced by the principle of falsification, sometimes called the hypothetico-deductive method. The logic of science, he argued, does not proceed inductively as in Baconism, that is, from the observation of data to the construction of theories or hypotheses. Science does not prove anything by conducting experiments, no matter how numerous, for the very reason that no matter how often a theory is tested there is always the possibility that it can be falsified. Popper's argument against verification, or justificationism, is illustrated by his famous example that 'no matter how many instances of white swans we may have observed, this does not justify the conclusion that *all* swans are white' (1959: 27). Popper instead proposes the principle of falsification, or the 'trial and error' theory. Instead of proceeding inductively, science progresses deductively through attempts to falsify the results of previous theories. Rather than proceeding from the particular to the universal, Popper argues science proceeds from the universal (i.e. scientific hypotheses) to the particular, but from hypotheses.

Popper thus demolishes one of the beliefs of positivism, namely that science proceeds from the observation of data by means of experiments, which when repeated are verified allowing us to infer general laws about the nature of reality. Popper shows that the logic of science is determined not by a path to absolute verifiable knowledge but by attempts to falsify the results of other theories and therefore the theories science provides are only ones that have

withstood falsification. The scientist does not gather facts or data in order to construct a theory, but rather accumulates data to falsify prevailing theories: 'Knowledge does not start from perception or observations or the collection of data or facts, but it starts, rather, from *problems*' (Popper 1976: 88). The result is that scientific knowledge is uncertain knowledge, but is nevertheless the most certain kind of knowledge human beings can aspire to: its certainty consists of its falsifiability. The objectivity of science is the objectivity of its method. The theories of science are ultimately only tentative conjectures to solve problems and cannot be verified by empirical evidence, no matter how weighty it may be. Scientific statements are, then, statements that are in principle open to falsification, ones whose truth content can be tested empirically. Scientific truths can only be 'corroborated'; they cannot be verified. Tautological or metaphorical statements cannot therefore be scientific since they cannot be falsified. Popper believed this also applied to Marxism, which he regarded as historicist (i.e. a metaphysical philosophy of history) and based on the positivist illusion of historical laws. Marxists, he argued, always stressed the evidence in favour of their theories while ignoring evidence that could falsify them.

Critical rationalism breaks certain defining tenets of positivism. It rejects the naive inductionist notion that the scientist observes reality without theoretical predispositions, for the scientist always operates from a theory that has withstood attempts to falsify it. Science, Popper contends, does not criticize reality. In this sense it is value free for the scientist may not make judgements on the subject matter of science. The critical task refers entirely to the scientific method, which, Popper argues against scientific positivism, must reflect on itself for science is fallible, always potentially in need of improvement and correction: the best theory is always the best tested one. While upholding the unity of the scientific method for all the sciences, Popper concedes that the subject matter of the social sciences differs from that of the natural sciences. The nature of causality in society, where it is contingent, cannot be compared with natural causality, where it is always invariable. Moreover, it is the aim of the natural sciences to make prediction possible, while in the social sciences predictions can be self-fulfilling prophecies. Popper stands ultimately in the empiricist tradition of Hume in the recognition that the absolute certainty that Cartesian rationalism

strove for is not possible yet admitting that knowledge of reality is possible, however imperfect it may be. He believed in the unity of the scientific knowledge, arguing that the principle of falsification also applies to the social sciences, and moreover held to a correspondence theory of truth. While severely criticizing naive scientism he nevertheless stood for a scientific concept of science as the bearer of the most perfect form of knowledge.

In sum, the importance of Popper's critical rationalism is that he rejects the naturalistic fallacy of positivism not just in social science but primarily in natural science. In striking a major blow against the positivistic conception of natural science as a theory of how natural science operates, Popper undermined the possibility of a positivistic social science, which has always required the alibi of positivism in the natural sciences. Popper, it must be mentioned, was not the only critic of induction. Other leading critics, were Nagel, who wrote *The Structure of Science* [1961], Hans Zetterberg who wrote *On Theory and Verification in Sociology* [1966] and Hempel and Paul Oppenheim who advanced a 'deductive nomological' approach.

Popper's theory of science has been the subject of great controversy and Popper himself modified some of his earlier extreme and somewhat simple claims. It will suffice to mention here that the most important revision he made in face of massive criticism was that the logic of science does not only depend on the principle of falsifiability, for a theory is discarded not once it has been falsified but only when a new theory is there to replace it. At this point we can consider the work of Kuhn, whose place in the history of the philosophy of science is as revolutionary as the importance he accords to the logic of scientific innovation itself. Like Popper he accepted the unity of the scientific method of deduction.

Kuhn in his classic work *The Structure of Scientific Revolutions* (1970 [1962]) has offered the most sophisticated alternative to Popper. His main thesis is that science proceeds neither inductively as positivists maintained (from observation to theory) nor by the falsification of theory (as Popper argued). The most important factor in science is the shift from normal science to revolutionary science. He claimed, with many of Popper's critics, that scientific progress is not dependent on falsification to bring about a change in a paradigm. Scientists, he firmly believed, do not learn from mistakes, particularly if these errors are going to have very far-reaching consequences for the way science is conducted. Kuhn,

in effect, reduces Popper's principle of falsifiability to problem solving within normal science. In the course of 'normal science' scientists attempt to resolve problems or puzzles whose solutions are contained within the paradigm they operate, for paradigms also influence the questions as well as the answers. Kuhn argued that normal science does not look for anomalies for it is content to remain with the problems the paradigm is capable of solving. However, when an anomaly occurs this 'puzzle solving' may not be enough as the limits of the paradigm may be challenged. In general, scientists, Kuhn argues, are reluctant to break from a paradigm that offers them security. Scientists in the course of normal science do not look for anomalies and use the paradigm to impose the prevailing consensus. Thus the concept of truth that prevails is more one of consensus than correspondence. Very often it takes a new generation to make the break, as it may require a fundamental shift in cultural values. If an anomaly persists it may lead to a period of crisis in which 'extraordinary science' occurs, which is characterized by a plurality of views, and debate on the fundamentals of the paradigm begins. A new paradigm is then ready to emerge in order to solve the anomaly. The new paradigm subsequently comes to be accepted as normal science and a new consensus is established.

However, a paradigm is rejected only when a new one is available, for without a paradigm there can be no meaningful science. This may take a considerable length of time (so that extraordinary science may be more 'normal' than 'normal science'). Kuhn maintained Popper's break with positivism was incomplete for his principle of falsification only applied to normal science and could not explain the great scientific innovations. In normal science researchers are not in fact trying to refute a theory, but are merely looking for a solution to a puzzle, rather like a chess player who is not normally questioning the rules of the game. He also finally refuted positivism on the grounds that verification may be possible within one paradigm, but the same set of facts could imply a different outcome in a different paradigm: evidence can be used in different ways depending on one's paradigm.

Kuhn's importance in the post-empiricist conception of science consists of his demonstration that progress in science depends neither on induction nor on deduction, but on revolutionary breaks in paradigms: observation does not lead to theory. His starting point is not reality but scientific constructions (Trigg 1985: 14).

Neither the accumulation of evidence nor the ability to falsify a theory explain how science works, for these criteria fail to take account of the role of revolutions in science. These revolutions involve the intrusion into science of non-scientific elements, such as cultural values, which make some scientists blind to the implications of an anomaly and open the eyes of others. By admitting the role of a 'revolutionary transformation of vision' in the logic of science and the importance of historical and social contexts, Kuhn contributed to demolishing the scientific self-confidence of positivism in its identification of science with the holistic discourse of perfect knowledge, and, moreover, casts doubt on the role of progress in science in so far as this was cumulative. Scientific paradigms cannot be judged because they are themselves the basis of judgement: science as a cognitive system is ultimately shaped by the institution of science.

Nevertheless, Kuhn was not a relativist and believed in scientific progress. While the incommensurability thesis claimed that paradigms are frequently incommensurable, progress may still be possible in one paradigm but not necessarily across paradigms. Since Kuhn rejects not only absolute proof but also the principle of falsification, the only criterion left in his model is the prevailing consensus. In this sense Kuhn remained ultimately in the positivist camp since he denied the possibility of critical and rational consensus (Bernstein 1979: 93). However, one of the most important consequences of Kuhn's work derived from the importance he gave to the role of the 'scientific community' in the construction of science. Kuhn revitalized the empirical study of science in the turn away from an ideal methodology to the study of science by scientific means; moreover his work was followed by the naturalization of epistemology – a wide-ranging movement today, the core of which is neo-empiricist, conventionalistic and naturalistic study of scientific practice. In the present context it may be said that Kuhn hastened the demise of positivism, which was breaking down internally and criticized from without in various ways by a whole new generation of social studies of science. Some eminent examples are Fuller (1993) and Rorty (1979).

It would not be possible here to enter into a discussion on the debates to which Kuhn has given rise. I shall merely comment on Imre Lakatos's critique, which is generally considered the most important attempt to place the post-empiricist theory of science

somewhere between Popper and Kuhn, briefly introduce Paul Feyerabend's anarchistic theory, and finally discuss the implications of Kuhn specifically for social science.

Lakatos's critique of Kuhn revolves around the central critical argument made against Kuhn, namely that his concept of a revolution is irrationalist and too general as is the notion of a single, dominating paradigm governing normal science. Instead Lakatos (1970, 1978) proposes that normal science be considered more as a research programme that survives falsification for reasons of its general acceptability. This situation cannot be regarded as a paradigm since it does not have the general status that Kuhn attributed to it. The transition from one research programme to another is not always revolutionary in the irrational manner implied by Kuhn, but is the product of rational exploration of rival methodologies. The situational logic, such as cultural values and historical milieu, is thus less important than Kuhn believed. The result of Lakatos's intervention was a levelling of Kuhnian theory down to critical rationalism. However, he goes beyond Popper in arguing that the progress of science does not occur merely through attempts to falsify theory by new evidence, but in Kuhnian terms whole research programmes can be falsified. He modified Popper's principle of falsification to what he called 'sophisticated falsificationism': it is not single theories that are falsified but entire programmes and this occurs only when there is an alternative available. In other words, refutation does not automatically lead to rejection. Moreover, he tried to accommodate a degree of confirmation of theories. The history of science is the process by which increasingly more progressive programmes replace less adequate ones, but all of which, including programmes subsequently proven to be false, are important in the progress of science.

Feyerabend in *Against Method* (1975) represents one of the final figures in the relativization of science. His 'anarchistic theory of knowledge' argued for a pluralistic view of science that did not elevate science above other kinds of human knowledge, such as religion. Feyerabend generalized Kuhn's extraordinary science to be the nature of all of science and argues, in Wittgensteinian manner, that the meaning of science derives from its social application. The result of Feyerabend's critique is radical relativism. Feyerabend was a controversial and provocative figure who believed that science should be organized so as to enhance the

possibility of a democratic society. In *Science in a Free Society* (1978) he argued for the disestablishment of science in society, which he demanded should be reduced to the status of just one belief system among others. Science, in his view, should not be supported by the state since state sponsored science is undemocratic and is mostly conducted without the consultation of the public (see Chapter 7).

The implications for the social sciences of post-empiricism in the theory of science have been ambivalent. On the one hand, Kuhn succeeded in demolishing the scientific self-understanding of positivism in the history of the natural sciences, and therefore struck a blow against positivism in the social sciences. On the other, his theory of science is primarily a theory of natural science and cannot be applied so easily to social science, which is characterized more by a multi-paradigm status. The Kuhnian paradigms, even when reduced to Lakatos's research programmes, seem more like disciplines themselves in the social and human sciences. Social scientists are too divided to accept paradigms and it is therefore questionable if something like 'normal science' characterizes the social sciences, where there is a plurality of competing paradigms available. There is also another problem with the reception of Kuhn in social science. The consensus theory of science that Kuhn proposed has had an oddly conservative reception, often confirming positivism rather than undermining it. Kuhn himself rejected most of the radical implications of his breakthrough and denies the possibility of an external critical rationality that is independent of the epistemic practices of the time (Fuller 1992: 251). The idea of a cognitive consensus model within the scientific community had more appeal to conservative positivists than to more radical and critical conceptions of social science (Martins 1972: 52). Indeed, the actual empirical conducting of positivistic social science within 'normal science' is not in fact challenged by the Kuhnian approach, which primarily emphasizes the role of revolutions in the breakdown of paradigms.

Conclusion: constructivism and realism

In order to take the post-empiricist critique of positivism to its logical conclusion a consideration of other positions would be appropriate. These positions fall into two broad groups, namely

realism and constructivism. The former is principally represented by the critical realism of Roy Bhaskar, who rejects positivism in favour of an emancipatory theory of science that is both explanatory and interpretative. This critical realism seeks to rescue the sciences from relativism. One of the aims of realism is to retain the claims of science to objectivity and truth without conceding anything to scientism and the absolute unity of the scientific method. Critical realism can be seen as a way of rescuing realism and the emancipatory promises of science from positivism and relativism. Constructivism, on the other hand, is a more diffuse term to describe different post-empiricist approaches. In their most sophisticated forms, constructivist schools are best represented by the reconstructive–pragmatic social science of Habermas and Apel, post-modernism, various other positions such as interventionism, feminist epistemology, utilization research and Pierre Bourdieu's critical practice. However, to enter into a discussion on the critical realism and constructivist schools would be to jump ahead. In the next chapter the historical alternative to positivism is discussed: the hermeneutic and interpretative approaches.

Hermeneutics and Interpretation: The Search for Meaning

Introduction: defining the hermeneutical approach

In the previous chapter the critique of positivism was looked at from a point that broadly accepted the unity of the scientific method, even though it saw the subject matter of social science as being different from that of the natural sciences. Positivism evolved from its origins in radical liberalism to become the dominant form that the institution of science took in modern society. With the institutionalization of science under state control, the radical challenge to positivism was mostly represented by Marxism, which will be looked at in Chapter 3. In this chapter the hermeneutical tradition, predominantly associated with nineteenth-century German thought, is examined from its origins in the counter-Enlightenment of Vico and Rousseau, through eighteenth-century philology to the neo-Kantian school, phenomenology and its evolution into the interpretative social science of Weber and the psychoanalysis of Sigmund Freud. Finally, modern hermeneutical approaches are briefly considered in order to provide a full picture of the anti-positivist tradition.

While a discourse of realism pervades positivism, a discourse of constructivism runs through the hermeneutical tradition: social reality is seen as a meaningful construction and not as an objective reality. The hermeneutical approach is characterized by the following dominant tendencies: