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VOLUME I

CANONS & CUSTODIANS:
SCIENTIFIC INQUIRY IN THE
20TH CENTURY

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Knowing, the Known and Knowledge of the Social: An Introduction to the Philosophy and Methodology of the Social Sciences

Mark J. Smith

Why focus on knowing, the known and knowledge? By thinking about different kinds of knowing we are pinpointing appropriate procedures through which we can produce authentic knowledge. The knowledge produced can be seen as authentic in a number of ways. If the procedures involve a specified and clearly prescribed set of steps on predefined objects of analysis, then the authenticity is established through the production of authoritative knowledge. If the authenticity is only established through the acquisition of knowledge that is true to life, then a different conception of validity is at work. Knowing is an active process based also on certain presumptions as to what can be known, about whether there is a 'real' beyond our knowledge of it, about whether the real (if it can be said to exist independently of our knowledge) can be fully represented through that knowledge and whether the real has certain definite characteristics. Of course, there is a tendency towards path dependency in the way that certain assumptions about the *best* procedures for *knowing* are often seen as intimately associated with a specific way of thinking about what can be *known*. For example, in those epistemologies commonly associated with many forms of empiricism, the insistence on observation as a privileged reference point and source of knowledge (whereby it is assumed that researchers simply describe what they experience: sensations, impressions and perceptions) is usually accom-

panied with a denial of the 'real' existence of unobservable objects. By way of a contrast, the critical realist preference for rational abstraction and reproduction, as part of the process of demolishing chaotic conceptions, is associated with the presumption that aspects of social structures and relations are not always amenable to observation.

It is useful to think of the fabric of the debates in the philosophy and methodology of social science as made up of four broad *strands*, not in the chronological sense of a phase but as different ways of thinking what it means to be a social scientific researcher. It is these four strands that serve as the organising principle for this four volume collection. In particular, each strand has been characterised by having a distinct way of thinking through the idea of science and the relationship between the natural and the social sciences. The first strand, often linked with positivism and empiricism, tends to assume that scientific inquiry is feasible in the study of the social. The early social sciences modelled themselves on the natural sciences, mobilising the well-established metaphors and analogies that had emerged in physics and biology. Some were concerned to compare social change to species-like organic evolution, others attempted to identify the causal laws that explained social structures and processes. In all these cases they viewed *the social* and its constituent parts as definite objects of analysis with an objective existence in a similar way to chemical compounds or the species placed in biological taxa. In effect, social researchers were primarily engaged in developing a taxonomic account of social structures and processes in much the same way as curators in natural history classified birds, insects and mammals. Inevitably, the classificatory practices they drew upon in order to allocate social relations to distinct categories and subcategories were shaped by the historically and socially specific values and assumptions of the time and place in which they lived (for example, descriptions of particular societies were shaped by racial/ethnic accounts of difference; see Gilroy, 2000).

The second strand, in historical terms running alongside the first, started from a premise that the social was in many ways different from the natural, so requiring a completely different set of assumptions about what *the social* as an object entailed and how to study it. Rather than assuming that the social researcher was an independent knowing subject examining objects that were distinct in terms of form and substance, this strand acknowledges that the knowing subject is indeed part of the object. It followed from this that social research had to take account of two related issues in order to achieve an adequate understanding of *the social* and social scientific practice. First, the *exterior issue*, the social context in which research exists is relevant for

understanding the knowledge produced. Weber for example suggests that social research is value-relevant, i.e. relevant to the problems and issues of the society on which it is conducted. Second, the *interior*, the interpretive and hermeneutic procedures used by researchers for providing an academic account of the social world in a way that is different from the common sense of those who simply inhabited that world or used non-scientific criteria for representing it (including art, politics and journalism). The proposed solutions to these problems are many and varied for they are a product of the intentions of the social researchers. In some cases they can involve a fairly detached analysis of aspects of the social, perhaps assuming that the key motivation for all actions is 'rationality' (as an *a priori* principle). Phenomenologists disagree, suggesting this tells us more about the assumptions of the researcher than those being studied, proposing instead that researchers should be involved enough to gain an insight into their lives but detached enough to stand back and provide an account that adds value to our understanding (see Schütz in Vol. II).

The third strand is more recent and while some ideas were developed earlier on scientific conventions (the writings of Pierre Duhem for example), this discussion really only took off from the 1950s and 1960s. In both of the previous strands, a particular conception of natural science was dominant and the disagreement had been largely about whether the social sciences should be the same or different. This strand challenged and demystified the idealised reconstructions of science that had been presented by logical positivists and falsificationists, redirecting our attention to 'logics-in-use' (Kaplan 1964). Rather than seeing science as part of the modern civilising process, conventionalists and sociologists of science encountered science as a messy and discontinuous business driven by politics and personality relations. For some science is a convention that has particular uses, whereas for others in this strand it is a social construction that is not very different from other forms of belief systems such as ideologies or religion. It has been remarked that the coincidence of the emergence of this strand and a wider questioning of truth and foundations is merely fortuitous, that writers such as Kuhn were simply in the right place at the right time (Fuller, 2000; 2003a). Certainly, Kuhn caught the imagination of the cultural revolt in Western societies from the 1960s and has been blamed or applauded from different quarters for producing a *crisis of rationality* and for undermining the canonicity of scientific knowledge. Whether this is the case or not, these contributions performed an enormous service in questioning widely held understandings of the character of science and the trust we place in it.

The final strand is more diverse and could ultimately lead to an unravelling of various future strands. At present, what unites them all is the acknowledgement of complexity, but what divides them all is the different ways in which this complexity is understood. Part of the work of challenging closed system analysis, and the associated *attachment to detachment*, was already underway in the second and third strands. Contemporary approaches to the philosophy of social science draw upon social and political theory to explore the situated character of social scientific knowledge (see Deleuze, 1968). There is a renewed interest in the context of knowledge production and a concern to challenge injustices and forms of social exclusion. Feminist and multicultural approaches point to the complicity of the academy in legitimating gender and cultural inequalities. Post-structuralist approaches, suggesting that meaning is relational, explore the historically and socially specific meanings of what are taken to be essential and foundational concepts, ranging from epistemological categories such as truth and the subject to political and cultural categories such as rights and friendship. Critical realism grew out of the crisis of Marxism in the 1960s to develop a more comprehensive research agenda based on the premise that a scientific understanding of the social was a prelude to human emancipation. Marxists still exist in this tendency but the currents in critical realism are now much more diverse, drawing on thinkers as different as Adam Smith, Friedrich Hayek, J. M. Keynes and Alfred Schütz. Such explicit normative content in epistemology and methodology can be said to be a weakness, but their obvious reply is that all of the strands addressed in this collection relate to political projects, whether it is Ayer's leftist progressive politics, Popper's classical liberalism or Weber's liberal nationalism. Scratch beneath the surface and there is a close relationship between questions of truth and justice, between epistemology and ethics, waiting to be revealed.

In accounting for the strands above, there are obviously debates and disagreements that emerge from the way each strand is woven and the twists and turns these generate. In the following sections these will be explored in more detail to provide an introduction to the concerns of each volume in this collection.

Canons and Custodians

Disciplinary and the preference for closure are closely related to the desire for authoritative knowledge, and discipline formation has been

a distinctive feature of the history of social science since the nineteenth century. The unifying characteristics of a discipline include its capacity for self reference and self regulation (*autopoiesis*). Disciplinary discourses are effective to the extent that they provide a framework within which meanings can be regulated. They attempt to shut down the possibility of alternative interpretations by drawing upon the stock of common sense knowledge. Discourses regulate the production of meaning with reference to an established set of textual sources (often canonised) and within the institutional practices through which we classify people. One way in which this is achieved is through directly tapping into tacit prejudices, values and taken for granted assumptions about cultural differences. For a disciplinary discourse to work, the use of language also has to be organized through good story telling (McCloskey, 1983) directed towards relevant audiences.

The role played by social scientists as custodians of established disciplinary formations is also important. Researchers are embedded in the language systems and specific cultural values, the rules of conduct informing social practices and the institutional and textual conditions of knowledge production they inhabit. By drawing upon Bourdieu's (1984) analysis of the way 'taste classifies the classifier', we can extrapolate to social science, that the attachment to markers of authenticity like validity, reliability, rationality, truth and progress are important tags in the classification game. Social science also has its carefully maintained stable reference points through which we can recognise an 'authoritative' intervention, using the accepted rhetorical formula of a particular field of knowledge. Institutional agreements on appropriate ontological and epistemological assumptions are essential to disciplinary unity.

The distinctions which operate within knowledge production serve as a measure of value. As a result, social scientific practices often attempt to mimic the 'authoritative voice', embodying the cultural heritage of a specific time and place for a specific audience and in the process camouflaging cultural values as scientific facts. In identifying these processes we can gain useful insights into the constitution, stabilisation and maintenance of the sedimentary qualities in the territory of disciplines. The self image of disciplinary projects is that of an *arborescent system* (a hierarchical system of unifiable objects), a territory with clear boundaries and a robust sense of its own importance in rebuffing the annexation tendencies of neighbouring disciplines – though this may involve the appropriation of a unifying principle from another field (Deleuze and Foucault, 1977; Deleuze and Guattari, 1987).

By far the most successful motivator for disciplinary formation, positivism saw itself as a socially progressive force, a reformist movement contrary to its current portrayal as conservative and reactionary. Positivists believed they were capable of replacing older forms of knowledge based on superstition and religious belief with a factual understanding of the world that would enable human affairs to be planned and organized rationally and for the ultimate benefit of all. It is important to note that the term 'positivism' refers to the attempt by social scientists to apply the methods and assumptions of natural sciences to social science (in particular, the assumptions of physics and biology). The term was applied by Comte when describing what came to be known in sociology as 'social physics'. The establishment of Comtean science as a movement for a civic religion, and successive accounts by thinkers such as Herbert Spencer and Emile Durkheim, tended to lead many positivists to draw upon their own assumptions uncritically, leaving them open to the charge of 'metaphysical speculation'.

Logical positivism used the intricacies of philosophical logic to attempt to rid scientific knowledge of these misunderstandings. Six key assumptions can be highlighted. First, the epistemological objective of *naturalism*, the idea that the assumptions and methods of the scientific method can and should be transferred to the social sciences. Second, *phenomenalism*, the idea that direct observation through our sensations provides the basis for valid knowledge. Related to this is a specific use of the term *nominalism*, the idea that scientific concepts 'capture' real objects or 'reflect' the world in a mimetic sense, so that statements which cannot be validated by direct observation (or are true by definition) are meaningless. Fourth, in many accounts within this tradition, especially those that treat physics as the queen of sciences, *atomism*, the idea that an object of study should be broken down into its smallest component pieces. Fifth, the goal of positivist epistemology is to generate *scientific laws*, the idea that direct observation can generate explanations that are universal in application. Sixth, the key thing to maintain is a separation of *facts and values* so that the key thing to maintain can be avoided. The technique that logical metaphysical speculation can be avoided. The technique that logical positivism provided, drawing on the philosophical logic of Bertrand Russell and Alfred Whitehead's *Principia Mathematica* (1910-13) as well as Ludwig Wittgenstein's *Tractatus Logico-Philosophicus* (1922), was to maintain a rigorous distinction between analytic and synthetic propositions in order to avoid meaningless statements.

But what are the implications of these assumptions for the practice of the social sciences? They certainly suggest that social scientists

should be rigorous and pay careful attention to demonstrating the proof of their assertions. In its pursuit of universal laws, positivism also suggests that the social sciences can play an important role in establishing how and why the social world works and can thereby make concrete interventions to improve it. These ambitions underpinned positivism's dominant position in the immediate post-war years and the policy orientation of much social scientific practice at that time. However, some of the assumptions of positivism have come to be seen as problematic. One of the most obvious practical implications of positivism is the belief that the knowledge it produces is value free and thus objective; often leading to situations where the culturally specific values and prejudices of a particular time and place can masquerade as scientific facts (such as the assumption that some societies are further along a putative evolutionary course than others, and thus more advanced while others are infantilised, or that specific genders are more or less likely to be 'rational'). Such criticisms suggest that positivism's ambitions to produce objective knowledge are deeply questionable. Indeed, the problematic nature of positivist knowledge is demonstrated when pre-existing notions of 'race', gender, age and class tend to be taken up and reproduced in what are assumed to be rigorous and impartial scientific accounts.

Similarly, a question can be raised regarding the belief in atomism within positivist and empiricist approaches to knowledge. The implication of the atomist assumption is that social scientists should break down a given social phenomenon into its smallest component parts, usually the individual. Obviously, this presupposes that it is individuals who cause or produce collectivities and also that all social phenomena can be understood as the aggregate of individuals' decisions and actions. Such an approach has a respectable pedigree in the social sciences, but it is also one with which many social scientists (Durkheim included) would take serious issue. Indeed, a key assumption of much social scientific thinking is the opposite, that individual actions and decisions cannot be separated from wider social values and beliefs (see Vol. II)

One of the main reasons for logical positivism and its successors taking such a strong hold on social science from the 1930s, is the perceived need to clean out such value-laden and metaphysical assumptions from the production of scientific knowledge. Not only must all scientific knowledge be verified by reference to experiences (interpreted narrowly as the passive reception of sensations and perceptions), any meaningful statement must not violate the distinction between analytic and synthetic propositions (in order for the

statement to be meaningful rather than meaningless). Isaiah Berlin, who was a fellow participant with A. J. Ayer and John Austin in the All Souls philosophy group, argued that the verification of statements was only achieved by them being intelligible and ultimately came to the view that the ambitions of logical positivism in promoting phenomenalism and identifying 'infallible knowledge of incorrigible propositions' were pointless. As a result, many logical positivists (including Rudolf Carnap and Ayer) found such a strict demarcation criterion between science and non-science unhelpful.

Contrary to the strong stance of logical positivism, Ayer argued that some statements of science and of ordinary life were meaningful but could not be conclusively verified through experience. For example, as argued by Berlin, general statements such as 'all men are mortal' refer to an unlimited class of objects but only a finite number of instances can be observed. In addition, statements about the past cannot be conclusively verified, and the best we can hope for is that such statements are probably true. Ayer's response was to suggest that 'weak verificationism' was appropriate, not 'strong verificationism', while Hempel's standard positivism (the covering law model) attempted to develop an alternative set of rules for producing scientific explanations with these problems in mind. This is not to argue that other empirical approaches to social research are redundant (it is perfectly feasible to do empirical research without subscribing to empiricism). The scientific model may not be as easily transferred to social research as positivist social scientists hoped, but this does not necessarily imply that we have to dispose of it. Perhaps the most influential exponent of this position is Karl Popper.

Popper's falsificationist approach attempted to overcome some of the limitations of positivist science. Drawing on David Hume, he introduced an element of scepticism (or critical rationalism) into scientific thinking, replacing positivism's claim to scientific 'truth' with the weaker notion of 'verisimilitude' (knowledge that can be taken to be reasonably reliable given the current state of research and debate). Popper argued that scientific knowledge should be considered to have verisimilitude only to the extent that it could not be falsified (that is, proven wrong by alternative evidence). Importantly, he also rejected the nominalist assumption that concepts and statements that are not reflections of direct experience are meaningless. Popper accepted that valuable ideas could appear from all sorts of unexpected places and associations (which he referred to as 'creative intuition', derived from the writings of Henri Bergson), yet was stringent in saying that they only acquire the status of scientific knowledge when corroborated by

empirical observation. This meant that Popper was proposing an alternative demarcation criterion between science and non-science. Rather than arguing that a scientific statement was a product of observation, he argued that a statement must simply be open to empirical and theoretical tests. In short, if it can be tested and is thus open to refutation then it is scientific. His rejection of psychoanalysis and Marxism as pseudo-sciences is simply on the grounds that the statements they generate cannot be subject to a test. As a result, Popper remained wedded to empiricist approaches to knowledge construction (such as the separation of theory and observation and the symmetry of explanation and prediction) while rejecting key elements of positivism (such as nominalism). To anticipate the challenges that followed, this meant that *bold conjectures and strict tests* should be applied to singular statements not theoretical systems, a point anticipated by Willard van Orman Quine (picking up from Duhem) when he wrote of the textured character of theoretical systems. In addition, for Popper, the scientific method only applied to the actual testing of a statement, not to the intuitive and subjective relations and process through which such statements emerged.

Understanding Social Scientific Practice

While empiricists apply the scientific method of the natural sciences to the study of social relations and processes, idealists argue that the social is fundamentally different from the natural and thus requires a different approach to knowledge production. In Table 1 you will find some of the alleged differences between natural and social science that idealists have posed. In short, idealists reject naturalism. They argue that it is an inappropriate basis for social research, asserting that the distinctive characteristics of people demand a different starting point, taking account of their normative, value-laden, concept-dependent and context-dependent activities.

Idealist approaches have their origins in the philosophy of Immanuel Kant. In this strand, it is assumed that we can never reproduce or know empirical reality in a direct or unmediated form but only through the mental constructs that organize and simplify its diversity and complexity into something that makes sense. This means charting a 'middle path' between rationalism (the production of explanations via reason) and empiricism (the production of explanations via observation). Social researchers in this strand see the social world as more open-ended and complex, so that it is difficult to generate adequate explanations through observation alone. By far

Table 1: Natural and Social Science From an Idealist Point of View

Natural Science	Social Science
Inanimate nature and living organisms	Human actions and practices
Non-evaluative, positive	Evaluative and normative
Objective experience (hard facts)	Subjective experience
Description of physical data	Interpretation of psychological and cultural data
Closed system (small number of controlled and discrete variables)	Open system (large number of variables that can be defined loosely)
Exact	Inexact
Quantitative, numerical and measurable variables	Qualitative, non-numerical variables
Predictive power of explanations for identifying specific outcomes (the symmetry of explanation and prediction)	Prediction is limited to specifying patterns and is not the sole criterion for establishing the usefulness of an explanation

the best illustration of mainstream (neo-Kantian) idealism in social science is the *ideal type analysis* devised by Max Weber, that social scientific explanations should combine mental constructs and empirical observation. Ideal types, such as the theory of the market, are simplistic exaggerations devised by knowing subjects (not reflections of the real) that simplify and clarify the flow of social relations and events, enabling us to explain their patterns and understand their effects. Social scientific model building, system analysis and typology construction are all typical idealist devices.

Not all idealist approaches place such a strong emphasis on synthesizing imaginative constructs with empirical observations. In contrast, some tend to privilege certain bedrock assumptions (like the concept of 'rationality') in their theoretical framework, for example rational choice theory and game theory. Rational choice theory sees 'rationality' as a mental construct that helps us explain and predict the processes at work in empirical reality. This is done to limit variability and contingency (by assuming that rational actors maximise their benefits and minimise their costs to ensure utility) in order to construct explanations and predict patterned behaviour (describe by Ludwig von Mises as 'qualitative prediction'). As a result it is often remarked that

rational choice theory is uninterested in empirical observation and falls into the trap of confirmationism that Popper warned us against. Rational choice theory and neo-Kantian approaches are both underpinned by the belief that the empirical social world can and should be studied as an objective reality, as something that is separate from the researcher – even if this social world cannot be known or understood as directly and as easily as empiricists claim.

Weber is a little more cautious, more explicitly accepting that the real is too complex to be reflected in total, arguing that besides the assumption of rationality we ought to recognise other motivations for action such as habitual customs and emotional attachments. Hayek, in particular, warns us of the dangers of conceptual realism (Whitehead described this as the fallacy of misplaced concreteness), the error of assuming that we fully understand social relations and processes in a concrete situation rather than treating concepts and theories as provisional. If social scientists believe they have discovered the laws that govern societies then it is a short step to social engineering. Hayek was concerned to challenge the tendencies towards scientism in social research, tendencies that lead to authoritarian political outcomes. Despite these differences there is a tendency towards methodological individualism in all these idealist approaches mentioned so far: that the basic unit of analysis is the individual as a genetic principle of social action, and that we start from individual actors and work up to explanations of the collective.

Not all idealists neglect the intersubjective character of the social world. Many are engaged in qualitative research into small-scale face-to-face situations and search for the meanings through which people interpret experience in their ongoing social interaction. But yet again there is variety depending on how they characterise the shared relations and common stock of knowledge that enable individuals to know themselves through interaction and different forms of exchange. In this context I will mention interactionism, phenomenology and ethnomethodology, all of which attempt to provide a more detailed understanding of the lives of those studied. They argue that the only way to produce authentic knowledge of a social situation is by studying the social actors directly and constructing an account of their actions and interactions based on the understandings brought to the actions and interactions by the social actors themselves. The concern with better or deeper understanding signifies how they accept the uniqueness of meaning production in everyday social interaction. This does not mean that explanations are unimportant but that they challenge the idea that actions are the product of a simple stimulus-response relationship or

grounded in an *a priori* principle. They restrict their explanations to formal conceptual generalizations, arguing that the forms of relationships often exist in different situations even though the content varies according to context and the subjective intentions of those involved. Examples include the concept of 'total institution' or of 'career', the latter taking an idea from occupational studies and using it to trace the career paths of criminals and mental health patients. The research techniques used are in-depth interviews, direct observation and/or participant observation, often combined with personal documents as secondary sources; though statistical sources and questionnaires also play a part – but often as topics of research rather than as a resource. Whereas pragmatism and interactionism focus on observable empirical relationships, phenomenological and ethnomethodological researchers tried to go a little deeper by seeking to establish the taken-for-granted common-sense assumptions of respondents (*tacit knowledge*) that facilitate intersubjective exchanges. Moreover, they often insist on adopting Alfred Schütz's *postulate of adequacy*: that the second order constructs of social science should be informed by the first order constructs of everyday life and should be intelligible to those they have studied (see Schütz 'The Stranger' in Volume II).

Whereas empiricists, rational choice theorists and neo-Kantian idealists often focused on producing authoritative knowledge for policy makers in established institutions, many researchers who wanted to be more involved in the lives of those they studied adopted a deliberately partisan approach. The research techniques selected were sometimes the only effective way to study marginalized and inaccessible groups. In addition, the experience of 'standing in the shoes of respondents' radicalised the politics of the social researchers involved so that they became concerned with power relations and the informal mechanisms of social control. By the 1960s, many of these researchers were openly presenting themselves as the 'voice of the powerless' in new social movements against the official institutions that sought to control and regulate the behaviour of these groups. They also challenged the academic custodians who they believed were preserving the power of oppressive institutions. In particular, the questioned how psychologists, criminologists and psychiatrists often selected the 'usual suspects' as suitable cases for treatment (or even incarceration) on the basis of their social background and status. For example, they challenged the treatment of individuals in the criminal justice system, prisoners in the penal system, patients in mental health institutions and the clinical practices of psychiatrists. In this academic culture war, these partisan researchers were increasingly regarded as

either dangerous subversives undermining authoritative knowledge or, more positively, as 'myth exploders' challenging the classification and management of human populations. The legacy of these debates is twofold. In relation to the next strand they provided a wealth of experience in developing the research techniques suitable for qualitative research on scientific practices. They also provided a conceptual apparatus that enabled the researchers and theorists in subsequent strands to rethink their role in the production of knowledge and relations of power (explored in detail in Vol. IV).

Scientific Knowledge as a Social Product

In the first strand, Quine established how breaks and discontinuities in the texture of theoretical systems can be accommodated by adjustments elsewhere so that it is quite feasible for science to avoid the rigorous application of idealised reconstructions of the philosophy of science – falsification in fact offers no guarantees. As a result two forms of problematisation emerged that posed questions about the foundational assumptions of scientific inquiry. One of these questioned the view of science as the gradual accumulation of knowledge and elimination of errors with all the associated stories of the march of progress where science is associated with the delivery of humanity from the confines of nature. The second used painstaking and in-depth qualitative investigations to reveal that the actual conduct of scientific inquiry as social practice bears no relation to the picture of epistemological purity and consistency painted by philosophers. Out of these investigations came two insights. First, that knowledge production in all contexts is a human and thus a social product. Second, the normative point that, since natural science was just as prone to the contingencies of every other social practice, then why should social science try to live up to the same impossible standards. This opened up the floodgates for a proliferation of appropriate criteria for judging what is adequate knowledge and an increased awareness that we need to think through the values and assumptions that underpin our judgements and how these are grounded in taken-for-granted classificatory systems about truth and falsity.

Inevitably, the central figure in the conventionalist critique of science is Thomas Kuhn (1970). In particular, he is credited with or denounced for undermining the empiricist claim that scientific enquiry identifies factual knowledge about the world and, through accumulation of these facts, is gradually progressing towards a 'full'

or 'complete' account of reality. Instead he used a conventional historical narrative of periods of stability (characterized by periods of puzzle-solving consensus on what normal science involved) punctuated by sudden transformations. Even Popper, who was critical of the notion of 'truth', wanted to hang on to the strong sense of scientific progress, even if he was never sure whether they had missed truth somewhere along the way. Kuhn, however, argued that knowledge can change but does not progress, rejecting this 'stairway to heaven' view of science, although he accepted that some scientific explanations are more useful than others. In scientific revolutions, when the anomalies of a period of normal science have accumulated, a paradigm shift takes place (analogous to a gestalt shift) over the period of a generation and a new paradigm is asserted (a new set of beliefs and methods about scientific knowledge and practice), one that may have no resemblance to the previous one. Moreover, since each paradigm is a 'different world', then the criteria for demarcating science in one should not be legitimately used for judging another. If phases of science can move from one set of knowledge-claims about how the natural world works to another, this questions the idea of cumulative knowledge.

Not surprisingly, the challenge Kuhn posed generated enormous hostility, not least since his intervention was published in a book series devoted to the unification of science. More telling was Margaret Masterman's (1970) plea for clarification when she discerned at least 21 meanings of the central term 'paradigm' in his writings. Feyerabend (1975) had also raised the possibility, in his studies of the history of science, that Kuhn's account of normal science was as inaccurate as the idealised reconstructions of the falsificationists. Due to this barrage of criticism, Kuhn qualified his standpoint – providing second thoughts on the precise meaning of a paradigm as disciplinary matrix but also issuing more specific criteria for distinguishing science from non-science (accuracy, consistency, a broad scope, simplicity and fruitfulness) that was in many respects similar to his opponents. Feyerabend responded with the *principle of proliferation*, arguing the case for methodological pluralism.

This questioning of the verities of science continued apace in the new field of the sociology of science. Barnes (1977) and Bloor (1976) provided thick descriptions of the social context in the production of scientific knowledge and the ways that knowledge was closely related to the varied interpretations and interests of researchers.

With the established epistemologies in question, sociologists (see Knorr-Cetina, 1981; Mulkey, 1991), considered a variety of metaphors

to convey the social conduct of research, ranging from gift exchange to the analysis of networks. Latour and Woolgar's *Laboratory Life* (1979) used ethnographic research to highlight the disparities between the actual conduct of scientific inquiry and the way published reports reconstructed the process to create a convenient fiction that conformed to expectations of scientific procedures in order to generate trust and maintain the cycle of credibility. Scientists have resented these interventions, feeling that they have lost control of their own history. While scientists have now accepted that politics and ethics are part of the organised research communities, much of the push towards public understanding of science has been to try to restore the tarnished reputations that they believe resulted from these kinds of social research.

While reluctant to endorse the 'mob psychology' of Kuhn's normal science, Imre Lakatos accepted the relevance of thinking about research programmes as organised systems of thought. In developing *sophisticated methodological falsificationism*, Lakatos found a way of building on Popper's defence of progress. This enabled him to tread a middle path between conventionalism and empiricism, acknowledging some of the arguments by the conventionalist studies of science while retaining an affiliation to falsificationism as an approach that generates useful and cumulative knowledge. However, rather than concentrating on the empirical testing of singular statements (in the process labelling Popper's approach a *naïve methodological falsificationism*), Lakatos argued that we need to focus on bodies of theory and evidence in research programmes, made up of untested hard core assumptions and a protective belt of auxiliary hypotheses that are subject to tests.

Lakatos argues that research programmes can evolve in various ways before they become exhausted and start to degenerate. Nevertheless, even flawed research programmes should be kept, if an alternative one is not ready to take its place. Thus, Lakatos acknowledges that scientific research is always historically and socially located but argues that, through falsification, science can and does produce increasingly 'useful' or 'accurate' knowledge about aspects of the real world. The uses of the ideas of Lakatos and Kuhn in social science have been many and varied, certainly at variance from the way Kuhn defined 'paradigm' in relation to incommensurability. Social researchers have latched onto these ways of thinking about organised research, in part because this provided a standpoint where so long as one approach dominated then they could claim to be scientists. More often though, 'paradigm' was used loosely to designate a research tradition or school of thought, especially in politics and sociology.

The rhetoric of progress and concern to maintain rigorous empirical testing outlined in the methodology of scientific research programmes have however proved attractive in some social scientific disciplines such as psychology and economics. Indeed the Lakatosian approach to positive and negative heuristics (on what can and cannot be legitimately researched) provides useful insights into the codes of conduct in social research, especially when it raises questions about the unacknowledged and untested assumptions that lie in the hard core of a research programme in the natural and social sciences.

This interest in the organisation of research and the status of disciplines has been reunited with phenomenology in the emergence of a 'new production of knowledge' approach (Gibbons *et al.*, 1994; Jacob and Hellstrom, 2000) which highlights the interconnection between the knowledge produced by researchers and the institutional context of its emergence in the academy. They draw a sharp contrast between Mode 1 and Mode 2 forms of knowledge production, or alternatively between disciplinary and transdisciplinary knowledge, in order to highlight the emergent diversity in knowledge production and, by implication, the increasingly competitive criteria by which we judge what is worthwhile and valued in academic output (developed more fully in Nowoiny *et al.*, 2001). Each mode of knowledge contains an

Table 2: Contrasting Mode 1 and Mode 2

Mode of Knowledge Production	Mode 1	Mode 2
Problem solving	problems are set and solved in an academic community	problems are set and solved in the context of application
Knowledge base	disciplinary	transdisciplinary
Extent of organizational unity/diversity	homogeneity	heterogeneity
Organisational form	hierarchical	heterarchical and transient
Communication of knowledge	dissemination through established institutional channels [peer review journals, conferences]	diffusion through problem solving and in new contexts of application [communication networks]

Source: Smith 2003

epistemologically specific demarcation criterion as to what constitutes valuable knowledge, each serving as the basis for the embedded classificatory procedures that regulate meaning in a specific field.

The 'new production of knowledge' approach constructs an ideal type contrast of two modes of knowledge production, with Mode 1 being challenged by Mode 2 (see Table 2). Mode 1 involves the traditional mode of knowledge production through hierarchically organized disciplinary science primarily located in the university system, whereby accountability is located in the academy through mechanisms such as peer review and a promotional system that works on patronage (the role of academic leadership is that of the custodian). The idea of Mode 1 is a 'complex of ideas, methods, values, norms' established to diffuse knowledge in an appropriate way, in this case based upon a model of scientific practice (failure to adhere to these norms ensures exclusion from the legitimacy that being a scientist brings).

On the other hand, Mode 2 is non-hierarchical, operating within a context of application (research problems are not set in the disciplinary matrix but arise from elsewhere) and is characterised by a transdisciplinary approach and heterogeneous organizational forms constructed for the purposes at hand. Mode 2 social science, because it involves collaboration on a localised problem, involves a range of actors with greater opportunities for accountability within and beyond the academy. Quality control/assurance tends, therefore, to use a wider range of criteria and, Gibbons *et al.* argue, create better conditions for reflexivity "at the deepest levels". Rather than science and scientists, in Mode 2 we have knowledge and practitioners with:

1. knowledge intentionally useful to industry, government and a variety of wider audiences;
2. knowledge formed through a process of negotiation between different agents with different interests (contrary to the pretence of disinterested detachment in disciplinary knowledge);
3. institutional diversity – M2 work takes place in departments and laboratories but also in think-tanks, institutes, research centres and consultancy networks;
4. variety of application, not just in the traditional sense of applied knowledge, for M2 knowledge production reaches the parts that disciplinary knowledge fails to touch.

The focus in M2 is problem solving, which can only be achieved in a transdisciplinary way, whereby practitioners develop temporary agreements in the context of application and are prompted into

creativity to make it work (or fail in the attempt) so that the end result does not map onto disciplinary knowledge.

Transdisciplinary knowledge is explicitly motivated by interests (it actively violates the fact-value distinction that remains an important part of the rhetoric of knowledge production in science). In *Rethinking Science*, Nowotny *et al.* (2001) revisit these issues in a more cautious way. Transdisciplinarity is seen as a response to the loss of belief in the project for unified knowledge, seeking to address this without simply bolting disciplines to each other (as in multidisciplinary science). They go further to suggest that transdisciplinary research (as a form of problem solving) involves a process of communication between knowledge producers and the multiple heterogeneous stakeholders, bringing different forms of situated expertise into the process and creating scope for various criteria to be relevant in assessing the knowledge produced – replacing the sole use of reliability with socially robust knowledge.

Reinventing the Social Sciences

It might be better to see this strand as made up of various loosely bound threads that all have the potential to develop into new strands. It is also important to consider one or two troubling issues, in particular the use of terms such as social construction and relativism. There are some who embrace the label social constructionism (such as the sociological study of scientific communities) and in these situations it is appropriate for it is linked to an explanatory strategy, usually influenced by post-structuralism. More often, it is a pejorative term, designed to suggest a failure to recognise rationality, truth and a commitment to human progress or even emancipation. Even less useful, it can be used an umbrella label (rather like the tertiary or service sector which refers to everything from hair stylists and plumbing to financial services). Instead of providing us with a useful explanatory tool, 'social constructionism' in this sense is what critical realists call a 'chaotic concept', lumping together assumptions and practices that bear little or no relationship to each other or separating forms of knowledge that are closely related. To illustrate, 'social constructionism' has these features when it throws together assumptions from idealist, conventionalist, discursive and postmodern approaches to knowledge (simply on the basis that they are against positivism and empiricism). Thus it is a label that should be treated with extreme caution! There are similar problems in the use of terms such as 'relativism' (especially

when it is used as synonym for social constructionism). Rom Harré and Michael Krausz (1996) provide useful guidance on the trickiness of using relativism, highlighting that even the claim that all forms of knowledge are situated is in fact a universal statement of sorts (see Vol. IV). Words are deeds and the terms of debate in epistemology are never, or perhaps hardly ever, innocent.

This can also be seen in the way that feminist and multicultural social research has shaken up our assumptions about the relationship between knowledge and reality. Gender studies is a wide-ranging field but we can briefly explore the implication of some of the arguments against androcentric (male-centred) knowledge here. All feminist approaches are concerned to stress the effects of male-centred assumptions in the way that the social world is represented. The problems that result include the focus on aspects of social existence where men traditionally predominate (such as politics and the economy) and the marginalization of issues that as a result of convention are regarded as women's issues (such as economics focusing primarily on firms rather than households; with the latter treated as residual and defined in terms of the status and economic standing of the male householder). There is gender-bias and misrepresentation both in the selection of topics to study and the way objects of analysis are defined. Three broad patterns of response to this problem have emerged.

Feminist empiricists, such as Millman and Kanter (1975), argue that the problem of bias and partiality can be remedied by the strict application of empiricism. Androcentrism violates the fact/value distinction and is seen by feminist empiricists as a deviation from the careful and systematic application of the scientific method. This feminist epistemology suggests that all these problems can be resolved in the *context of justification* (the testing of statements using empirical evidence) and they ignore the *context of discovery* where researchers define their objects of analysis and what should be investigated. It is in the context of discovery that the mainstream character of social science originates (social science by men, on men and for men).

Feminist standpoint approaches argue that knowledge is shaped by the power relations of the social structure. This means that the knowledge produced in existing institutions will, on the whole, be shaped by the values of the dominant group in a specific society, in this case the patriarchal social structure. Just as knowledge can support a set of exploitative and oppressive social relations,

it can also challenge them. In addition, they argue that subjective and personal reflections of social relations and processes that are produced by the oppressed group provide an objective knowledge of that social structure, which can be used to transform it. Like realism, the feminist standpoint approach poses the existence of partially unobservable social structures and causal mechanisms and, also like realism, is an emancipatory social science.

Feminist postmodernism (though it would be more strictly accurate to use the label feminist post-structuralism), challenges the claims to objective knowledge made by feminist empiricists and feminist standpoint approaches. They argue that all knowledge is situated and, in challenging the assumption of patriarchy, that no single explanatory principle can provide a universal account. Research, they suggest, should focus on the complex mixes of social antagonisms that are present in each time and place.

Similarly, social science is often ethnocentric, focusing on the issues and concerns of certain social groups, treating some groups as social problems, in some cases pathologising them, in order to normalise the ethnic identities that are privileged in the social order. Post-modern (such as that of Jean-François Lyotard, 1984) and post-structuralist approaches have drawn our attention to the way that the judgements we make are not neutral attempts to separate true from false but are associated with other judgements that have ethical, aesthetic and political implications. Lyotard argues that science makes a claim to authority on its supposedly sole use of the 'denotative game' (the empirical identification of facts and the use of logical reasoning), on its position that the distinction between truth and falsehood is the only game in town, and on its exclusion of other 'games' or evaluative repertoires (for example, those governing notions of justice and injustice, or what a 'good society' looks like). In other words, scientific knowledge claims authority on the bases of its supposed ability to distinguish between 'facts' and 'values'. However, Lyotard suggests that these other evaluative repertoires, or ways of making a judgement, continue to shape science and, in fact, serve to underpin its cultural authority and plausibility.

The point of these approaches is not to sketch out a future society, but drawing on Nietzsche, Heidegger, Derrida, Deleuze and Foucault, to place foundational assumptions in question, undermine canonicity and challenge the custodians. In this regard, there is a close relationship between linguistics and social science. Foucault states the dilemma very clearly in the form of a question – how can we have a history of

truth when truth has its own history? For Foucault (1980, 1982), this is a starting point for thinking through the complex discursive constitution of subject positions, some of which are enabled and empowered but others (such as the criminal, the homosexual, the migrant, the persistent offender, the insane etc.) are reduced to pathological categories where they lose the capacity to speak for themselves and their voices are subject to the ventriloquism of authoritative people with expertise occupying positions of power. In this approach the relationships between power and knowledge, between institutions and language, are intricate and intimate. Discourses regulate what can and cannot be said, what can and cannot be thought, what can be thought of as normal and what is seen as abnormal or pathological (Smith, 2002).

The present concern with linguistic theory should not be regarded as novel; after all, the logical positivists were applying a formal philosophical model of language. Epistemological discussions have made constant use of the different ways in which the linguistic analogy is applied (that the nature of the social mirrors the nature of language). Rather than asking whether we have experienced a linguistic turn, we need to ask more often what a particular understanding of language means. For example, empiricist approaches to knowledge and meaning, particularly those associated with positivism, assume that scientific language offers a straightforward reflection of the world 'as it really is' (a mimetic standpoint). The scientific method, empiricists argue, allows us to uncover the meanings inherent in the world and to understand them free from the distorting impact of human values and preconceptions. In contrast, idealist approaches argue that for knowing subjects the world is only knowable through the medium of the constructs devised by the human imagination (not inherent in the material world) as it struggles to understand the sensations that make up everyday life (an intentional standpoint). What distinguishes many of the approaches in this strand is the claim that meaning is not the product of the human imagination (as idealists would argue) nor is it present in observable material reality (as empiricists would argue) but is produced in and through discourses or other ways of defining linguistic, representational and symbolic systems. It is at this point that they diverge. For some the key focus is rhetoric or the uses of codes in the production of meanings, for others it is the utterances and forms of speech in everyday life through which meanings are performed.

In a similar way, critical realists question empiricist claims that only empirically observable phenomena can be accepted as 'true' but they resist the post-structuralist treatment of the extra- or non-discursive (which is simply speech or *parole*). For realists, such as Roy

Bhaskar (1979) and Andrew Sayer (1992), just because we can only have knowledge of something through mental constructs or symbolic systems, this does not mean that the thing itself is illusory, or without objective properties and effects. They start from the premise that for science to be possible, the real must have always existed regardless of whether we had found a means of accessing it. Reality makes experiments intelligible. The real or the 'deep' exists even if we can have no direct observational access to it. They avoid the word 'dis-course' and like falsificationists only talk about knowledge as fallible. Accepting real or deep complexity does not always imply the acceptance of representational or discursive complexity. When considering whether the study of the social is scientific, the realist answer is 'yes, but that we also need to rethink what science involves'. Sayer argues that we need a better understanding of the underlying social structures (the relatively enduring recurrent relations and processes that appear to have solidity) and how they are produced, reproduced and transformed through meaningful human agency. These structures enable and constrain the range of meaningful human interactions that are possible but they are susceptible to change and can even be removed – i.e. structures are seen as the condition, medium and the outcome of social agency. Realists give priority to a pre-existing social formations which they see as shaping and limiting discursive practices. Social science can serve emancipatory purposes, removing unwanted forms of determination and helping to construct wanted determinations (accepting determination without determinism). The relationship between post-structuralist and realist social research is one of mutual miscomprehension. Both claim to incorporate elements of the less detached forms of idealism and conventionalism and this may be the route to some kind of truce and convergence (in different kinds of post-realist and post-structuralist neo-phenomenology).

Close to a Conclusion: An Appeal for Rethinking the Researcher as a Subject Position

What is clear is that disciplinary knowledge depends on strict control of academic socialisation and dissemination as well as unrealistic assumptions about how such output is understood. The transdisciplinary approach offers one route to being object oriented rather than procedure bound and so can constitute a common ground for both post-realist and post-structuralist research. Object orientation involves an approach that is most likely to avoid partiality and on-sidedness in research

design and conduct by acknowledging the complexity and contested character of objects of analysis (Smith, 1998a; 1998b; 2000a; 2000b; also see Fuller, 2003b and Sayer, 1999). The role of the researcher, whether they see themselves as epistemologist, theorist, policy analyst or research technician, provides a nodal point for thinking through the relationship between questions of knowledge and methodology. It is an interesting side-effect that the epistemological assumptions about the relationship between *knowing subject* and social *objects of analysis* are often translated into the way human agency is treated in knowledge production within a research programme (which helps to explain the close links between empiricist mimetics and behaviourism). I have argued that there are three kinds of subjectivities that researchers can inhabit and this is where cultural theory can be especially helpful (Smith, 2003; 2005). They can be summarised as follows.

The custodian – in cultural analysis such intellectuals are those engaged in preserving the standard and defending the predominant system of cultural classification (of high/low) and the process of training through which discriminating judgement can be acquired, attaining a standpoint of disinterested detachment. In social science, these are the defenders of the disciplinary hard core – the orthodox or bedrock assumptions as to which objects of analysis are worthy of attention, how these objects are to be defined and which knowledge production procedures are most appropriate (the classification of true and false, science and nonsense), providing a conceptual vocabulary in which canonised points of reference are embedded. The relationship between the subject position of the researcher and relevant audiences (often confined to the esoteric) is thus linear and one directional (a feature of the first strand and the more detached versions of the second strand).

The reformist, posing a challenge to the custodians by embracing the popular, celebrating the masses, elevating the status of the mundane and the ordinary from everyday life. This is represented by the culturalist tradition from Raymond Williams (1965; 1981) to Paul Willis (1990). The response has been fierce – they have been ridiculed by custodians as vulgarisers responsible for both undermining the canon and perpetrating the insidious effects of 'dumbing down'. This accusation highlights the weak point of the reformist position; they do not challenge the process of classification itself, they simply reorder and replace items in different pigeon holes. While they may challenge the custodians and standard bearers, they retain the

aim of a new fixed inventory – today's reformists often become tomorrow's custodians. Many of these carried with them the democratizing vision that knowledge and critical inquiry fostered a more informed citizenry and improved the political culture (and with it the implication that elitist approaches to knowledge and culture fostered political deference and passivity). The relationship between the subject position of the researcher and relevant audiences is thus two directional (a feature of the less detached approaches in the second and third strands) but once the lived experiences of the people studied have been acquired there are still tendencies to adopt a linear monologic approach.

Third here is the subject position of the *articulator*, a transformationist standpoint challenging the necessity for a fixed inventory, regarding classification systems (the very criteria through which we classify and hence value texts, artefacts and practices) as negotiable – and that applies not only to where we place things but how we value them. This approach to classification as a negotiated outcome, as always provisional, helps to us to problematise the succession of taken for granted truths. From this standpoint, theories with the pretence of universality (often combined with a tendency for the detached researcher to impose their own values and assumptions on their objects) can be revealed as culturally specific while at the same time masquerading as factual and appearing to possess neutrality. This approach is more explicitly methodologically pluralist and acknowledges the intertextuality of meaning production and consumption. In addition to recognising that meanings are contested, the relationship between the subject position of the researcher and relevant audiences is also viewed as complex and dialogic. These are most apparent in the (post-)realist and poststructuralist approaches in the fourth strand.

Conventionalists highlighted a clear difference between 'reconstructed logics' (the idealised and instrumental accounts of disciplinary knowledge) and 'logics in use'. It is the latter to which we should direct our attention and by questioning 'canonicity' we can begin to unravel the mechanisms through which disciplinary has been established. Of course, a direct appeal to 'culture' is not necessarily the answer. For a start, there are especially strong parallels between cultural elitism and disciplinary formation in the social sciences. Nevertheless, as indicated in the discussion of Mode 1 and Mode 2 knowledge production earlier, evidence of disciplinary resurgence in

some areas should not be seen as a retrograde step, but as the outcome of complex processes that can only be understood with careful attention to the historically and socially specific conditions in which research is conducted. These four volumes provide a way of mapping these alternatives and helping us to make decisions about the future direction and role of social research that can recognize the complexities of the subject-object relationship and accommodate how meanings are produced through use rather than just inscribed in the text.

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PART ONE

LANGUAGE, EXPLANATION AND REALITY
