

In Defense of Realism and Dialectical Materialism: A Friendly Critique of Wright and Burawoy's Marxist Philosophy*

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I welcome this chance to jump fields and comment on a debate in sociology, particularly in view of the regrettable tendency of left intellectuals to replicate the academic division of labor. The debate over method between Wright and Burawoy in this journal recreates in exemplary form a clash of views that runs through all modern philosophy. From one side, the dispute is over knowledge: its acquisition and veracity. From another side, the dispute is over the nature of the world: its ways of workings, and our participation as social scientists and/or revolutionists. These puzzles of epistemology and ontology, which go back at least to the Enlightenment, have no easy resolution, and there has been continual tension and oscillation along several axes--between empiricism and essentialism, rationalism and conventionalism, relativism and positivism, and the like. Philosophers are only slowly sorting out the issues and eliminating fallacious arguments from the pantheon of ideas, such as Kant's "a priori" or Hegel's "world spirit," thanks in large part to progress in the sciences that have pushed notions of time, space or God beyond the brink of what was known two centuries ago (Bitsakis, 1987).

I take the view that dialectical materialism still offers the most satisfactory resolution of some old puzzles in philosophy and social science. I take as given, moreover, that contemporary realism is entirely consistent with this classical Marxism, and that its good name has to be salvaged from both the attacks by Burawoy and the defense put up by Wright.¹ Wright and Burawoy are caught on the horns of what may be characterized as the classic Kantian schism between mind and external reality, or knowledge and the social world, and are unable to find a coherent way out. On Wright's part, there is a longing for greater certainty in the face of a recalcitrant world and a slippery foundation for wisdom: hence his tendency to fall back on a positivist theory of science, with its empiricist and rationalist overtones. Burawoy, for his part, opts

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1. To see that realism grows largely out of Marxism, look at Bhaskar (1979: Ch. 4); Sayer (1984: Ch. 1); and Sayers (1985:88-93 et passim). How realist philosophy is used is another question altogether. Some writers have turned realism into an attack on Marxism and a virtual defense of relativism. Burawoy and Wright seem to have encountered realism only through Bhaskar. Wright has read *A Realist Theory of Science*, but transfers it into the social realm with little awareness of the elisions of method involved. Burawoy, for his part, hastens to reject Bhaskar's corpus on the basis of *The Possibility of Naturalism*. The two Bhaskars go pedalling by each other, and the realist case falls between them.

for revolutionary engagement and practical activism; yet, in leaping from the mountaintop of certitude he slides down the slippery slopes of subjective idealism (and political volunteerism) into the bog of relativism. Both positions are insufficient.

I. The Latent Positivism of Erik Wright

There once was a fellow named Popper,
Who argued that science most proper:
From method quite straight
Must not deviate.
T'would seem he's philosophy's Copper.

I wish, in concert with Erik Wright, to defend the possibility of social science and of gaining valid knowledge into the structure of society. I also wish to uphold the good name of realism as a philosophy of that sort of science. Although Wright claims realism as his method (1987:28), one may doubt how far realist theory has penetrated into a mind already deeply impressed with the merits of the positivist methods of social science in which he was schooled. By "positivism" I mean, above all, the search for a method that provides a secure route to the truth, although there are several variants within the positivist school (Gregory, 1978; Bhaskar, 1986).²

Wright wants too much certainty. In this he carries the positivist spirit: to find a way by which to generate "positive" knowledge, i.e. unambiguous truths, unsullied by metaphysics or politics. Positivism, in its several forms, tries to establish truth through formal rules of language, mathematic operations, argument by formal logic, admission of only hard data, statistically valid inferences, objective inquiry, and so forth. While considerable clarity can indeed be achieved by these means, they are no guarantee of truth, or even of very productive scientific activity, as Wright's comments (1987:40) on "method-driven" inquiry point out. Positivism is to science as cook-books are to good cuisine. Wright rejects the worst of modern empiricism, but clings to the spirit of the positivist enterprise. Therein lies the idealism that taints his defense of scientific Marxism.

Positivism has, in its wide compass, embraced three main paths to truth: an empiricist ontology in the tradition of Hume, a rationalist epistemology in the fashion of Kant, and an idealist ethic of the dispassionate scientist. Wright follows these well-traveled roads, and, despite his protestations, is actually quite un-realist-ic in his arguments.

2. For a provocative argument that positivism is *the* characteristic bourgeois ideology of science, see Bhaskar (1986).

The Ontological Shallowness of Empiricism

The first path of positivist method is empiricism. The central proposition of Bhaskar's "transcendental realism," to which Wright avers, is the ontological distinction between events and mechanisms (Bhaskar, 1978). Bhaskar is at pains to show up the empiricist fallacy that regularities in observed events are a sufficient foundation for scientific laws. Rather, science consists in the discovery of the functioning of underlying mechanisms that generate events. Empirical observation alone cannot provide access to those generative processes because events are the joint product of essential causes and contingent causes. More is needed: for example, experiments in which contingencies may be controlled for, and reflection upon the ways unseen mechanisms operate. This philosophy casts doubt on the empiricist faith in simple observation, data gathering, statistical methods, and inductive reasoning (direct or naive realism) as a stepping stone to knowledge.³

Wright knows all this, but does he really take it to heart? He wants the data on classes, for example, to speak to him more clearly than they are wont, and this explains his intense theoretical and practical attention to matters of empirical data gathering, refining and testing (Wright, 1985, esp. Ch. 5). In the *BJS* interview, he goes off on an extensive discussion of controlling observational error (1987:34-36), as if this were the critical issue in realist philosophy, which it is not. It would appear, rather, a concern of the positivist trying to get in the empirical back door. The search for empirical regularities alone is inadequate to the understanding of the effective powers of a given mechanism under widely variant circumstances.

Now it is true that one of the great difficulties in social studies is to separate out the essential from happenstance or, in the language of Bhaskar's realism, "mechanism" from "contingency." Systems are open to so many intervening causes that it is very hard to hold some constant in order to investigate others. As Wright attests, even the most painstaking practitioner is plagued by weak correlations and dubious attributions (1987:42). As a result, statistical fitting cannot be considered the same as theory testing (Sayer, 1984:192 & Ch. 6). This by no means rules out empirical studies that have as their valid aim the exploration of how causal forces operate under various circumstances. Such studies ought, however, draw on observations of the widest variety. Hence realist philosophers defend the kind of intensive case study for which Michael Burawoy is best known, as against relying solely on the extensive and

3. On the crucial difference between causal laws and instrumental laws (such as $E = MC^2$)—in which the latter are subordinate, refer only to empirical regularities, and are used principally for calculations—see Sayer (1984:115-19).

aggregate data-crunching involved in Wright's kind of social science (see Sayer, 1984:219-28).⁴

Rational Inquiry and Dispassionate Adjudication

The second path along the journey into positivism takes one in search of absolutely clear rules of thought and language that remove all doubt due to poor logic or imprecise categorization. At its most extreme position it involves a quest for a pure meta-language of science, in the image of mathematics. In philosophy this search reached its apogee among the so-called "logical" positivists such as Russell and (the early) Whitehead in England, and with Carnap and the Vienna Circle in Austria. But their effort fell under the combined attack of Wittgenstein's (1968) linguistic turnabout and Godel's incompleteness theorem.

Those whose clarity of mind and logical powers are as fine as Erik Wright's must suffer the loss more deeply than the rest of us. In reading Wright's works, one has to admire the absolute logical rigor with which he constructs his positions. Such clarity of thought can be extremely helpful in ferreting out conceptual mistakes. But scientific advance does not rest so neatly in the logical parsing of categories. The four-fold boxes that Wright loves to construct (at least he abjures on the mathematical equations so beloved of most positivist social scientists in our time) simply cannot hold the unruly processes of the world within their boundaries. There is something vain in his endless polishing of concepts in hopes that their brilliance will shine a beacon of light through the turbid depths of society (cf. Burawoy, 1987:58). Sayer calls this "the poverty of logicism" (1984:148-152; see also Harré, 1979). The universe is not logically tidy,

4. Ironically, Burawoy misunderstands the realist critique of empiricist science, and launches a bogus attack on realism as the *cause* of the difficulty of explanation in open and complex systems. This is called killing the bearer of bad news. He argues that a single observed event can be explained by postulating any number of different mechanisms (or, one might add, any set of different contingencies!) (1987:55; see Harvey, 1987, for a similar diversion). This is plainly wrong. First, because all of nature (and society) is incomprehensible from mere surface appearances, all theories--not just realist ones--are subject to the risk of uncertainty about their claims, not just realist ones. Second, because there is, indeed, a real world out there to check our theories against, the wrong ones do occasionally get found out for misspecifying mechanisms or contingencies.

Burawoy also objects to realism as a "correspondence theory" of knowledge (1987:59), in which ideas reflect or copy the external world. What he is actually objecting to is the pseudo-realism of empiricism, in which appearances are all there is to reality, and knowledge is locked in a superficial contemplation of the obvious. Burawoy has not understood this elemental tenet of modern realism--as is evident in his repeated equation of "empirical reality" with reality--and considers realism as principally a response to idealism (1987:59). The "correspondence" of knowledge to the objective world is that between coherent theories of order and process and the structures or mechanisms that generate systematic phenomena. The world is coherent and law-like in its operation and the theoretical "laws" of science seek to capture that reality. This is the realist conception of science; it is the Marxist, or dialectical materialist, understanding of science, as well.

as developments from quantum mechanics to the mathematics of chaotic systems ought to have made clear (e.g. Gleick, 1987). Hence, creative scientists regularly utilize modes of thinking that escape the narrow confines of analytic logic, such as Kekule's dream of the snake eating its tail as the model for the benzene ring; they do so because the world is not "logical" in the narrow fashion of certain philosophers. And this is why dialectics--that much-scorned set of "illogical" propositions--still contains some perfectly useful rules of reasoning about complex and changing systems (Sayers, 1985).⁵

In short, Wright longs for a more complete, deep and secure knowledge than is practically possible. Yet, fuzzy-mindedness can sometimes be as much of a virtue as fuzzy-headedness, as it gives one more patience with the inherent fuzziness of the world and of human knowledge. We have to live with a chronic uncertainty about knowledge-claims--and everything else in life (Burawoy, 1987:55; Sayer, 1984: Ch. 7). This degree of uncertainty about what we really know to be true (which is sometimes very little) undercuts the positivist dream of pure truth mechanically arrived at, and argues for a realistic sense of the difficulties of grasping the truth. This is Burawoy's objection to Wright spending so many years of a brilliant career polishing up class theory: our knowledge of class has not been increased commensurately to the effort (and Wright admits as much) (Burawoy, 1987:74; Wright, 1987:42). However, in moving away from the absolutes of the positivist faith to a practice of knowing in which verification and truth are much less certain, one can easily stray from the path of realism--as we shall see, in regard to Burawoy's position, below.

In the post-war period, the positivist banner was plucked from the hands of the metaphysicians by more sociologically-minded students of the history of science such as Popper (1968) and Kuhn (1970), who recognized the evolutionary nature of scientific knowledge, something which the logical positivists had been blind to by virtue of their search for absolutes. This generation was strongly influenced by linguistic philosophy and its demonstration of the concept-laden nature of all thought. Nonetheless, Popper and his followers, especially Lakatos, continued to defend the power of deductive logic, the need to test for empirical regularities, and the positive ideal of scientific knowledge

5. An utterly misguided effort has been underway recently to ditch the dialectic in Marxism and replace it with formal logic; Erik Wright has unfortunately thrown his lot in with this so-called "analytic Marxism" (Roemer, 1986). The leaders of the pack of self-proclaimed 'no-bullshit' Marxists are John Roemer and Jon Elster, whose rigorous misreadings of Marx are something to marvel at (Burawoy, 1986). It is dubious, however, whether Wright should be branded an analytic Marxist, *tout court*, given his emphatic rejection of methodological individualism (Levine et al., 1987). And while he spirits in a little neo-classical economics, following Roemer, he does not follow the latter in turning Marxism into an exercise in general equilibrium theory.

(Sayer, 1984:152-157). To Popper, theories may not be absolutely verified, but they can be and are falsified; to Kuhn, they suffer a buildup of anomalies that leads to replacement of an existing paradigm by a more satisfactory one.

The corrigibility of scientific theories and the linguistic turn introduced a note of uncertainty into philosophy that drove the soft-positivists back into the arms of Kant. That is to say, they fell into a *dualist* conception of epistemology in which mind and reality are forever sundered: the mind can only know the world through its theories (paradigms), which can never be positively verified (Sayers, 1985; Bitsakis, 1987; Bhaskar, 1979).⁶

Wright picks up the thread of Popper's neo-Kantianism in his espousal of an "adjudication" model, in which one must decide between contending theories as to which one better explains the phenomena in question (1987:26-27). Wright's rationalism thus consists not only in faith in logic but also in the fairness and honesty of the rational person. One might compare this to a competition of theories in the open marketplace, in the manner of Popper, or to a liberal democratic ideal of theories appearing before a rational assembly of academic minds or a court of scientific law, with one's colleagues acting as lawyers presenting the opposing case and the readership of academic books as the jury. This is hopelessly fanciful, given what we know of the high-minded objectivity and fairness of academic practitioners (Bourdieu, 1988).

Adjudication implies a formal and abstract weighing of evidence that depends heavily on the "psychological state" of the practitioner, as if passion were the enemy of reason (Wright, 1987:73). Such evenhanded weighing of all possible theories is rather naive, and, practically speaking, an impossibility; thinking progresses only by critical engagement for and against particular sets of opposing ideas. Indeed, to step back too far from the real engagement of ideas is to fall back into the abyss of ignorance; as Sayer puts it, "To abandon too much is to destroy our ability to think and to find ourselves struggling with what used to be straight-forward" (1984:75). One must therefore agree with Burawoy (1987:52-53) that "dogmatism" is not antithetical to truth; indeed, dogged faith in a new theory or defense of the old against false pretenders is essential to the pursuit of knowledge. Science as a whole would be impossible without the rabid commitment of certain people to the scientific project of unlocking the secrets of the world, including a dogmatic ethical position on honesty, clarity and the powers of

6. Kant's contribution over classical empiricism (or direct realism) lay in both his rationalist epistemology, in which the conceptual nature of thought is elucidated, and his realist ontology, which recognizes the unseen depths of the world. But he believed that the two sides, knowledge and being, could not be reconciled.

reason--exactly the sort of passion Erik Wright has in abundance (cf. Habermas in Adorno et al., 1976).⁷

Knowledge and Practical Activity

Realism and dialectical materialism are premised on an active theory of knowledge acquisition. One must therefore be leery of Wright's implicit vision of the social scientist as a mental worker weighing theory and evidence. Wright's model embodies a highly contemplative, quietist view of the way knowledge is arrived at. Yet science is preeminently a practical activity and unquestionably hard work (Sayer, 1984:19-21, 25-26, 1987; Bhaskar, 1979:19). The single most convincing argument that Bhaskar (1978) musters in defense of realism is that it makes sense of the labor of natural scientists in carrying out controlled experiments. This represents a huge step beyond positivism's idealization of science as "hypothesis testing" in the abstract, and puts philosophy on more advanced footing with respect to the development of scientific knowledge (Bitsakis, 1987). Burawoy is dead wrong to say that realism ends up as a form of idealism (1987:54), in contrast to "revolutionary" science that "comprehends knowledge as produced and validated through transformative practices" (1987:54). The latter is exactly what laboratory scientists are doing: experimental science, like all human learning, is transformative practice. So much for the distinction between revolutionary and non-revolutionary knowledge.

In the social sciences, where the object of knowledge is not terribly susceptible to controlled laboratory tests, practice means something more than laboratory work. Burawoy is absolutely correct to say that the road to social knowledge is through practice: "Knowledge is a function of engagement with the world" (1987:59; cf. Sayer, 1984:27). The idea that we gain information about society only in the form of census data or survey research would be laughable if modern academia's love-affair with statistics wasn't such a tragedy. We gain it every day of our lives, in everything we do. But most of everyday engagement doesn't take us very far and, like most surveys and censuses, generates rather superficial, partial and unreliable forms of information. What we want is to cut through to the ways of working of social systems. In this Burawoy is more of a realist than Wright: he wants to know mechanisms, not assemble facts. And he knows that the way to get at mechanisms is to push hard

7. Burawoy's defense of fervent knowing makes his eventual retreat to relativism all the more puzzling. The chief internal contradiction of philosophical relativism is that there is no reason, on its own terms, to think it superior to any other viewpoint (Sayer, 1984:72). One cannot be passionately agnostic! On the other hand, Wright pursues the logic of the positivist fact-value schism to the bitter end, at which there is no compelling reason to believe in the superiority of Marxist theory: "support for Marxism as a social theory is not primarily a question of a belief in its analytical and explanatory power. It is primarily a political question" (1987:45).

at the very fabric of institutions, so as better to feel the unyielding framework beneath. In short, he advocates social experimentation of the kind available to those with relatively little power: challenging Zambian university administrators, South African mine-owners or the government of El Salvador to see what happens. Such actions are paths to greater insight about society, how it operates, how it reproduces itself, how it oppresses and how it might be changed. Practice is thus also a way of testing our theories against the world (1987:59).⁸ It works much better than taking surveys of administrator, owner, worker or peasant "opinion."

It is one thing to oppose a merely contemplative conception of knowing, as Burawoy does, but quite another for imagination and reflection to disappear into the maw of an all-consuming political practice. Wright's defense of social science as against totally politicized, practical thinking is quite reasonable (1987:37). Burawoy (1987:59) does more than render theory and practice "inseparable;" they suffer a meltdown. He falls back on a vulgar Leninist appeal to "praxis" as the solution to all scientific problems (1987:59), which merely substitutes the empiricism of the practical for the practice of empiricism, and serves to make the theory of "praxis" (always written in Greek) a mysterious incantation rather than a sensible proposition about human life and learning. In fact, theory and practice stand in a dialectical relation in which difference and contradiction are still discernable.⁹ We learn from practical activity (material life) at the same time as we try out our ideas in it: that is the central premise of dialectical materialism. We need not decide which comes first--the activist chicken or the theoretical egg. We must, rather, be aware of the continual back-and-forth movement between action and reflection that takes place in all human life.

Because humankind has so often made a fetish of its powers of imagination, whether in Buddhism or modern philosophy, there is an understandable reaction among Marxists to overloading the mental side of human practice. Nonetheless, human knowledge does not come into being without the active contribution of the mind in processing inputs, conceptual ordering, pattern recognition, creative transformation of inputs, and critical reflection, among other things (cf. Chomsky, 1988). Hence the correct emphasis in the Kantian tradition on "the essential role that interpretation and reason play in the construction of knowledge...."

8. Burawoy does not fall for the old saw that experiments in social science are impossible; what is impossible is, of course, the kind of tightly controlled environment of the physics lab. However, one should not put social experimentation in a purely negative way, as learning about "the forces resisting transformation." Work for Hitachi or Reagan and you can learn about the forces better situated to experiment with and transform large slices of the social world.

9. Burawoy readily admits his discomfort with dialectics, a word which he regularly banishes from his classrooms. The lack of dialectical reasoning shows up in this argument.

The results of experience and experiment require interpretation--they do not have an absolute and immediate authority. The empirical evidence must be assessed, weighed and judged in the light of other knowledge of the world before its significance can be established" (Sayers, 1985:136). Insight into the ways of working of the world is required so that underlying compulsions of state power, the labor process, and so forth can be unearthed: "universality and necessity are not given in experience" (Sayers, 1985:26). To believe otherwise is to fall back on naive empiricism.¹⁰ Understanding and the growth of knowledge necessarily involve reflection, as Darwin discovered on reconsidering, back in England, the evidence he had gathered from the voyage of the *Beagle*--and hitting on the theory of evolution (Gould, 1985: Ch. 23). Curiously, while Burawoy objects to Wright's passive model of adjudication, he adopts an equally passive view of cognition.

II. The Latent Relativism of Michael Burawoy

There once was a fellow named Quine,
A philosopher who oft did opine,
That matters phenomenal
Are all strictly nominal,
And the world is without design.

Hardly had the post-1968 generation of Anglo-Marxists successfully completed their joust with positivism, in hopes of restoring historical materialism to a respected place in the universities, than they found themselves under assault by a new wave of relativism. The force of the wave has been such as to sweep up many radicals in its stream, leaving a great outwash of "post-Marxist" distancing from the supposed errors of excessively structuralist and narrow thinking (e.g. Castells, 1983; Laclau & Mouffe, 1985; Bowles & Gintis, 1986). It is most distressing to see Burawoy, who is one of the staunchest supporters of an uncompromising Marxist and revolutionary perspective against such social democratic leanings (e.g. Burawoy, 1989), sinking into this philosophical quicksand. Burawoy undermines his own materialism and radical politics by falling prey to the blandishments of relativism.

Relativism¹¹ has enjoyed a vigorous flowering in the last two decades across virtually every field of thought: in history of science, led by Kuhn

10. On Lenin's materialist empiricism, see Sayers (1985:9-14). In abolishing the active role of reflection, this approach also effectively abolishes philosophy, which becomes no more than an echo of politics. For the realist defense of the role of philosophy in relation to scientific knowledge, see Bhaskar (1979:5-11) and Bitsakis (1987).

11. Properly speaking, relativism is philosophical idealism, but I prefer the former term for its plainer everyday meaning.

(1970) and Feyerabend (1975); in philosophy led by Rorty (1980); in history, led by Foucault (1979); in literature, with the deconstructionists led by Derrida (1978); in psychology, with Laing (1967) and Lacan (1977); and so forth. The French have embraced it most fully, in a line running from structuralists such as Levi-Strauss (1967) to post-structuralists such as Kristeva (1988), right through to its degenerate form in the post-modernist ecstasies of Lyotard (1984).¹² The English-speaking world has been more restrained, perhaps, but has its own epigones in people such as Winch (1959), Rorty (1980), and Hindess (1976). Post-hoc passions for relativism are sweeping through American academia (e.g. Dear, 1986).

One must distinguish the milder forms of Kantian dualism and social relativism from more extreme idealist sentiments in this broad spectrum of opposition to historical materialism. In the former, as evidenced in Kuhn, Althusser or Foucault (in quite different ways, of course), reality is still to be engaged, and natural and human sciences are in some sense possible and desirable. I shall designate by the term "social relativism" the view that knowledge is a social product of the most diverse origins; that no one system of thought is manifestly superior to any other; and that no universal method exists to guarantee truth. These are not unreasonable propositions. Modern *social* relativism has a materialist stamp, owing to its premise that ideas are generated in everyday life. Nonetheless, social relativism falls prey to several idealist distortions of the real problems of human knowledge.¹³ On the other hand, more extreme relativists virtually reject any sensible world beyond the social mind: the world is a linguistic "text" to be constructed and deconstructed (Derrida); "anything goes" as between competing scientific theories (Feyerabend); Galileo was no more true to fact than Cardinal Bellarmine (Rorty); the modernist world is in fragments, truth is dead, communism is finished: long live chaos! (Lyotard). These positions edge dangerously close to the kind of irrationalism and nihilism of inter-war Europe, and are the enemy of reason, political action and social progress. I shall confine my comments to the issues raised by social relativism of a more cautious stripe.¹⁴

Social relativists, Burawoy included, are wrestling with real problems of social science and social practice. These can only be solved by recourse

12. For reviews and critiques, see Eagleton (1982, 1985); Dews (1987); Wood (1987).

13. Burawoy's admitted admiration of Foucault is, I believe, consistent with the philosophical confusions that cast a shadow over his more clear-headed approach to research and politics.

14. Indeed, it may be said that critical realism and critical relativism back into each other at the margin.

to the philosophy of dialectical materialism, of which modern realism is a variant--in as much as anything is ever "solved" in purely philosophical terms. We shall have to consider four points raised by Burawoy's arguments: the opacity of mind and scientific knowledge; the possibility of social science; the embeddedness of social knowledge in social practice; and the effect of power and social change on knowledge. They all flow from the theory of practice, which I argued for above, in concert with Michael Burawoy. If knowledge is not the pure, asocial artifact of positivist dreams, however, and is all mixed up, chock-a-block, with everyday, messy human existence, isn't it indelibly sullied, rendering the pretensions of science so much posturing?

Conceptual Blindness and Scientific Knowledge

A realist understands the Kantian dilemma that mind and the external world are in some fundamental sense sundered. We come to know the world only through the gropings of our senses and our mental constructs. We are, so to speak, "brains in vats," forever imprisoned in our corporeal form: we cannot commune directly with tiny quarks, ask gravity how it's feeling today, or jog over to the nearest quasar for a closer look. To the relativist, this presents an insuperable barrier to knowing. Reality is rendered opaque by virtue of the conceptual blinders human beings are doomed to wear. Burawoy thus rails against any "correspondence theory" of knowledge, in which cognition simply reflects or copies the external world (1987:59). That is, "facts' are shaped by social practices and theoretical frameworks set up an insuperable barrier to any direct apprehension of real mechanisms. We can never be sure what in the data is the result of the mechanisms we seek to comprehend and what is due to the 'distorting' influence of the scientific process itself" (1987:55).

Assuredly, the problem of cognition and understanding exists: concepts are never simply mental mirrors of reality, and the facts never speak for themselves. We "predigest" the world through our senses, our observational equipment and, most importantly, through our conceptual systems (Adorno et al., 1976). Nevertheless, it does not follow that "we can never be sure" what is real and what are the false images introduced by dint of our own eyes, ears, microscopes or theories.

Knowledge may be theory-laden, but it is not theory-determined (Sayer, 1984:68). While the concepts "front" and "back" as regards my head are relative and imprecise, I will be reminded of their usefulness if I imagine the difference to be one of theory alone, and begin to walk backward, only to bump into a wall. Similarly, I will be rudely awakened to the accuracy of the 'distorted' information provided by the imperfect receptors in my eyes, not to mention the pain-sensors in my backside. Relativism sees only the *negative* influence of ideas, bodily senses and

instruments of observation. But these, for all their imperfections, are literally the tools by which we unlock reality (Sayers, 1985:132-133). They reveal the nature of the world to us, even as they distort it. Take the eye: human eyes, dog eyes and fish eyes have characteristics that make each species see the world quite differently; yet they each function very well, and even meet on common terrain, as when the dog and girl play with a ball or the fisherman ties the right fly to land the fish. The fact of the ball or the hook was not created by the eye that saw it, however different the image in color and perspective; and the mind--even of the lowly fish--is remarkably clever at using its particular kind of vision to function in the world (cf. Wright, 1987:28). The differences are not trivial to human, dog and fish behavior, of course, but neither are all three blinded by their differences.¹⁵

The same applies to ideas: categories are to thinking as eyes are to seeing. They are our lenses on the world. Burawoy refers to Marxism as "the necessary lens" through which to see the world, but he quickly drops his poor eyeglass among the trampling feet of political interests encircling the social researcher (1987:66). Even the paltry lenses of Van Leuwenhoek allowed him to see what no one had even grasped before: micro fauna. But the metaphor of the lens is not good enough, for the human brain does not merely record what it sees or confine itself to the boundaries of individual concepts; it is wondrously quick at using observations and concepts to build a larger fabric of *understanding* of the world in a way science still hardly comprehends (Chomsky, 1988). The wrong lesson has often been drawn from Wittgenstein's (1968) arguments about word games: yes, we are limited in thought by the concepts given in the words of our language; but as every teenager knows, the limits of given words can easily be transcended, in the living process of speech, to say more than what the words mean. That is the creative tension of language--and all human thought.

Burawoy falls prey to the relativist ("sociology of science") error that "different accounts of the world are equally valid" (1987:60). He, too, has been infected by the neo-Kantian bug, and follows Feyerabend (1975) in holding that theories are, at root, "incommensurable," or at least can be compared only within "a very constricted conceptual space" (1987:57). Ultimately, he argues, judgement between competing paradigms rests on such fallible human foundations as "politics, morals and aesthetics" (1987:65; cf. Kuhn, 1970).¹⁶ As a form of adjudication this is hardly to

15. For a long discussion of the secondary problem in science of controlling for the influence of instruments in laboratory experiments, see Lakatos and Musgrave (1970).

16. Of course, internal coherence and elegance ("aesthetics") is a necessary condition for the defense of most theories, but it is not sufficient (Sayers, 1985:178); indeed, the dualism of internal coherence and external reference (logic and testing) cannot be sustained

be preferred to Wright's. In fact, contending theories (or worldviews) are commensurable to a large degree, by virtue of the considerable overlap and common terms between them (Sayer, 1984:70-71). This is so not principally because all language arises from a common structure of the mind across the human race (cf. Chomsky, 1988), as Lukes (1976: Ch. 6) avers, but because disparate minds are contending with the same referents in the real world.

Contending theories contain elements of both truth and falsity, and the best of them will never be entirely true in all their elements; but this does not render all theories equally valid. Better means truer, in the sense of explaining the world more fully or deeply. In the confrontation of theory against theory and theory with reality, truth must be sorted out from error, as wheat from chaff; and there's a lot of chaff in human thought. Nonetheless, scientists (and everyone else) make reasoned judgments between theories all the time. If I were to say that Zambia suffers not from neo-colonial labor relations but from the enervating effects of tropical climate, Burawoy would be pretty quick to suspect my theory was fraudulent, despite his existential angst about truth and verification and despite the truth of the claim that tropical heat can be enervating. (It's a good thing our social scientist doesn't "work to rule" by his own philosophical pronouncements, or he would never make such interesting judgments about the labor process and class politics.)

Just as learning is not passive absorption of information into preexisting categorical boxes, neither is it based on quiet contemplation and mental processing alone. It depends on constant engagement with life's situations in a way that involves continual puzzle solving, in practical activity (Burawoy, 1987:58). Most thinking is for doing, rather than pure understanding for the joy of it (though our marvelous brains often revel in their own powers). What is more, we solve puzzles by using the tools at hand, physical and mental. The evidence for this from the highest forms of abstract thought ought to make the case: Einstein discovered relativity in part by a metaphorical connection with images and sounds from streetcars and railways, while Darwin used the bourgeois imagery of the war of all against all to help unlock the secret of evolution. The scientific mind does not confine itself to formal logic, as I indicated previously, but utilizes the "tools" it finds all around, in life. This is the power of what is loosely called "metaphor": drawing on analogous situations from prior experience and knowledge to prise open the secrets

(Sayer, 1984:56). Also, if Burawoy had meant that morals and politics bring other real knowledge to bear in fruitful ways, then he would have been saying something more interesting. Actually, Burawoy caroms among at least three different versions of theory selection: "political, moral and aesthetic judgments," (1987:65) "commitment to the theoretical framework one adopts," (1987:65) and immersion in the practical interests of those being studied (1987:66).

of new situations (Sayer, 1984:60-62).¹⁷ Furthermore, our greatest stock of knowledge is gained through the lowly and immediate things of daily life, in which the dichotomy of mind and body cannot be sustained (Lakoff, 1987). Pure reason is a philosophical fiction.

Similarly, the growth of scientific knowledge does not consist in the lateral replacement of one theory by another, but in a succession of theories that transcend and transform one another (Kuhn, 1970; Sayers, 1985:168 fn.). This must be so, to begin with, because knowledge only builds on knowledge--human labor always requires materials and ideas with which to work--thus "rejected" theories are necessary stepping stones for their successors. If the latter are without truth-content, how can one sensibly proceed? So anterior theories always contain an element of truth, and posterior theories elements of falsity. This must be so, furthermore, by virtue of the internal gaps and contradictions of any non-trivial theory or body of knowledge. At the same time, progress in knowing consists in pushing back the frontiers of the known universe, opening up regions or levels of the world previously unimagined or whose mechanisms have been poorly grasped. This process does not mean rejecting what was previously known about the better-charted areas. Newtonian mechanics were not proven wrong by Einstein, but rather transcended in explanatory power for a wider range of circumstances. Similarly, Freud's mature theory of neurosis due to repression of early sexual desire has been negated in part--but not entirely overthrown--by the ugly reality (which Freud originally suspected) of sexual violence against girls that leads to psychological trauma among adult women. Conversely, while vigorous defense of accepted knowledge may be essential to the scientific enterprise, one must also be committed to giving up on those theories (or parts of theories) that have been supplanted; even our firmest conceptions are linked to weaker ones whose replacement may cause intellectual earthquakes from the epicenter. Hence, in the joint research and political program Burawoy advocates, at critical junctures one has to update Marxist theory in light of its ability to explain the world at hand.

The Possibility of Social Science

One cannot proceed to a defense of science as a unified practice--that is, with strong common methods of operation across the natural and social realms--without recognizing the fundamental differences between nature and society as objects of study. Wright makes this jump without sufficient inquiry and argument, as Burawoy trenchantly observes (1987:55). If social science is to be possible, as Bhaskar (1979) argues,

17. This does not mean that *all* learning can be reduced to reasoning by analogy, without taking into account the embedded processes of mind, as in linguistic competence (Chomsky, 1988:24).

there must be a possibility of "naturalism." The root problem, of course, is that people are conscious beings who think as they act and reflect on those actions, and who are, therefore, capable of creating entirely new social worlds. Human history does not run the mute course of atoms or stars. This reflexivity of the social object is the main consideration of the "hermeneutic" tradition in philosophy. Hermeneutics claims that societies are, by virtue of their constitution by conscious actors, irreducible to the terms of scientific investigation after the manner of natural sciences. That is, social inquiry must concern itself principally with the elucidation of human agency and the conceptions of reality that agents hold as they act--or what is usually referred to as the problem of "meaning" in social life. The hermeneutic case has been made emphatically in the work of Winch (1959), Berger and Luckmann (1967), Gadamer (1975) and Foucault (1979). A parallel thread runs through Western Marxism from Lukacs through Adorno and Sartre to Thompson (Anderson, 1980, 1983). The dialogue between naturalism and hermeneutics runs through all of modern philosophy, with periodic swings in popularity between the two (Bhaskar, 1979:22-29, 169-202). Indeed, classical Marxism uneasily embraces both the naturalist and the hermeneutic stance. This divide reappears in the debate between Wright and Burawoy.

Despite the hermeneutic insight, a case for naturalism can be made in so far as social systems exhibit both order and process--or "causal regularities." Three common objections to naturalism can be dealt with relatively easily. First, the fact that society is "socially constructed" has nothing to do with the possibility of naturalism. All that is required is that actions and social relations manifest some fixity over time and place. That is, one need secure only the minimal materialist condition that human practices show some regularity--that they are not merely dissolved at a moment's notice and recreated from whole cloth by the next idea to pop into anyone's head (Bhaskar, 1979:42-43; Bourdieu, 1977). Yet, as Bhaskar (1979:60) notes, "the characteristic error of hermeneutics is to dissolve intransitivity" in human affairs. The second proposition is that social outcomes exhibit few empirical regularities because social systems are irrevocably "open," and cannot be closed through controlled experiment. But openness is not a problem confined to social systems by virtue of human agency; it bedevils all scientific inquiry, as Bhaskar has shown (1978). It is nonetheless possible to extract some idea of the operation of underlying relations without benefit of widespread empirical regularities in events. Third, it is often claimed that social structures, unlike natural "mechanisms," are by their very nature not observable, because they involve purely mental relations of social meaning. For example, the relation of king and feudal lord rests on delicate bonds of assumed superiority, obeisance, duty and so forth. Nevertheless, those "meanings" are open to observation and interpretation in the ideas uttered by the participants and have even more tangible effects in the actions of the parties, such as modes of dress, deference or warfare.

A stronger claim is possible with respect to the thorny problem of human consciousness and the potential which creative intelligence poses for human action to take unexpected courses. Consciousness can be pinned down and grounded in material practice, giving it, too, a greater intransitivity. Ideas arise in the process of living, acting and reflecting on the experiences of life. In economics this process is known as "learning by doing." Because consciousness grows up around the materials at hand in everyday life, it bears a systematic relation to the character of society. This idea is the foundation of the Marxian theory of ideology. Because of this sensible relation to material activity, ideology is not a foreign set of maxims handed down by the ruling class; it is "like the air we breath," as Joan Robinson once observed. Rather, ideologies "reflect"--in the sense of being imbricated thoroughly in--the prevailing social order. Ideology is not, in this view, a ghostly superstructure floating over the substructure of life; it is part and parcel of material life.

Because ideology is part of the "habitus" or culture of everyday existence (Bourdieu, 1977), it is not easy for people to think in terms that are inconsistent with the rules of the prevailing social order. Their conscious activity, therefore, is ordinarily consistent with the reproduction of social structure. This view of bounded consciousness in no way precludes vigorous initiative and original agency on the part of individuals or groups, within the compass of "acceptable" behaviors and "reasonable" ideas (Park, 1974), nor struggles to think one's way in and out of society as it stands (Williams, 1977). Indeed, all human practice is interpreted through the lens of culture, whether of a nation, class or race, and all social conflicts are fought out, in part, as clashes of culture (Buck-Morss, 1987). The theory of ideology in no way devalues the power of ideas to move people, or makes them rational calculators of economic interest. Rather, it demotes the autonomous individual or class that thinks what it likes and does what it wants, free of history and society--which is quite a different matter.

Social relativism takes the materialist position that ideas are social products, and constitutive of social processes, but subverts it by going on to cut ideas and ideology loose from their practical moorings. Marx's conception of ideology holds the relative autonomy of imagination, lies and distortions in check. Ideology is not simply illusion. That does not mean that it is a correct representation of the world in its entirety or all its depth. Ideology is a limited form of knowledge, with central elements of untruth and deception. This deception is not something imposed from without (though certain interests will work hard to create and disseminate their ideas), but something inherent in the way society is experienced. As Godelier puts it, "it is not the subject who deceives himself [*sic*], but reality which deceives him" (1972:337). Or as Sayers asks: "Where do incorrect ideas come from? They come from reality--like

all ideas. In particular, ideological representations derive from and reflect reality. They take idealized and distorted forms, moreover, because of the contradictions and conflicts which are a part and parcel of real life. Their power is the power of reality" (1985:106). How can ideology be both a true and false representation of reality at the same time? Because knowledge, being part of the world, also has ontological depth. For Marx, ideological distortions arise from the superficial appearance of social practices, while more accurate (or scientific) ideas are those which probe more deeply into social structure.¹⁸

Many thinkers have tried to try to draw a solid line between ideology and science, and have, in so doing, rent the fabric of life and consciousness. Althusser's (1971) efforts are notable for their return to idealism in the name of scientific hardheadedness. Knowledge that is closely examined for its claims, so that the measure of truth may be pushed as far as possible over error, we may call "scientific." Contrary to the ideological conception of scientists-in-white-coats, "science" is no more than carefully regulated social labor, involving close attention to clarity of thought and assemblage of evidence, whose aim is the acquisition of special and profound forms of knowledge. The mastery of every human craft (from carpentry to basketball) is, by this definition, a kind of science--though it is always encased in a variety of unarticulated insights, slipshod methods, rules of thumb, and local mysteries that are usually referred to as the 'art' of such practices. Burawoy is correct in his assessment that Wright is merely replicating Althusser's idealist defense of science by reference to the distinction between science and ideology and an appeal solely to the "theoretical practice" of the academic

18. It may be protested that the powers of imagination can--and regularly do--allow the human mind to think of things bearing no resemblance to reality, such as God on a cloud or purple dragons. Yet, as Feuerbach saw, religion is peopled with figures bearing an indelibly human stamp (just as the Starship Enterprise is filled with situations from American life circa 1967). And, as Marx argued against Feuerbach, these imaginings are rooted in a heartless world against which the human spirit rebels; hence, "once the earthly family is discovered to be the secret of the holy family, the former must then itself be criticized in theory and revolutionized in practice" (Fourth Thesis on Feuerbach). Freud made the same analysis of dreams: they are distorted plays on events, injuries and yearnings of real life (Sayers, 1985: Ch. 5). Indeed, a Stanford University dream research team has recently shown that dreams track real events with approximately a six-day lag time. Of course, most people's waking hours are not filled with dreams and hallucinations but with reasonable ideas about the world in which they function. At the social level, the hallucinatory and strictly imaginary element of thought is screened out even more severely, by what language and convention accept as possible to express. Nonetheless, psychosis, cults and U.S. Presidential elections all involve very large divergence between ideology and reality. Insanity--which is measured by the degree of divergence from a grasp on everyday reality--has many origins, but it grows precisely out of the degree to which the mind (in a psychotic), the individual (sitting, perhaps, in the White House), or the group (sequestered in Jonestown, Guyana) is cut off from an outside reality that might offer a check on their hallucinatory wanderings.

(1987:69). In this Wright veers quite far from realism, which treats science as a form of human labor like any other.

Knowledge and Diverse Social Practices

Social relativism takes off from a valid conception of the materialist dialectic of life and consciousness to make a much stronger claim. It holds that all systems of thought are equally valid, because equally bound to earth by divergent material conditions and discrepant systems of meaning. Partial and divergent systems of knowledge (ideologies) are central to Burawoy's case against realist social science: "If knowledge is produced through engagement with the world, different engagements produce different accounts of the world which are equally valid....This necessarily introduces a certain relativism..." (1987:60). This social relativism is the ontological complement to the Kantian epistemological position, which we have already encountered: that all systems of thought are incommensurable because ultimately self-referential, cut off from one another by mutually incomprehensible language and axioms. It sounds much more materialist and hard-headed, but has the same dualist premise: that there is no way to escape the prison of ideas--or the prison of culture--and touch the real world. I call this the "immersion" theory of consciousness, and it is common among ethnographers and cultural geographers. In philosophy its principal exponent is Peter Winch (1959, 1970).

Immersion theory is certainly not Marxist, despite the attempts of Burawoy to sound very materialist and dialectical, as when he says: "the world is neither external to us waiting to be mapped nor is it a figure of our imagination but exists in an inseparable relationship to us. The [social] world does not exist outside our relationship to it. We cannot separate ourselves from the world we study" (1987:59). In thus contesting the positivist idealization of the scientist outside society looking in, he goes too far in making all social relations internal and necessary (Hegel's position, not Marx's). Burawoy's affinity with immersion theory corresponds to his own scientific allegiance to sociology's version of the ethnomethodological position, "participant observation." He spends long periods working in factories, from which he culls marvelous information and writes brilliant treatises (e.g. Burawoy, 1979, 1985). In these he argues for the centrality of class relations in the workplace for understanding the broad operation of advanced capitalist, socialist and developing nations. Naturally, his immersion in factory work influences his outlook on capitalism, which takes (in my view) too little cognizance of things such as credit formation and the banking system, and generates a somewhat different view of class than Wright's. Nonetheless, it is a practice that generates a penetrating view of capitalism, socialism and neo-colonialism--which makes Burawoy's retreat to relativism all the more puzzling.

The problem for social science is how to escape from the confines of ordinary ideology, from the hermeneutic circle of life and consciousness. Burawoy sees no way out, no Archimedean point from which to establish truth (1987:59). He tries to evade the issue by spiralling out to the future in an endless series of puzzles (1987:58). But this will not do. First of all, it conflates the possibility of truth with the process by which knowledge grows, and in so doing evades whether anything resembling "truth" can be established. It can. Once again, the intransitive realities of society and material life, which exist outside our heads, our interests, and our ideologies, exist and provide a check on the pretenses of knowledge claims (Bhaskar, 1979). Blood circulates in the veins, regardless of how different cultures may try to explain that bodily process. Denying such scientific knowledge makes a mockery of philosophy by making the savant more ignorant than any 20th century child with a 6th grade education. In the same way, I maintain, capital flows in the channels of the world economy, regardless of how variously the process of value-augmentation is felt around the globe. Anyone with the slightest exposure to either Marx or the *Wall Street Journal* knows this, too. Thanks to the widespread dispersion of the process of accumulation, we can overcome our different experiences to grasp, in some measure, the common mechanisms of commodity production, profit-making and competition. Why are we suddenly rendered blind to the obvious or the well-known by incursions into philosophy or anthropology? This is not to dismiss the considerable difficulties in overcoming one's social position through the hard work of critical inquiry and political practice. But throwing out what we already know, through fear of contamination by ideology, merely makes matters worse.

Furthermore, the distinction between social science and everyday knowledge is not one between truth and illusion, or between Platonic objectivity and immersion, but rests, instead, on the relative ontological depth and breadth of understanding held by various participants in social life. It requires abstraction from daily matters in order to capture more systemic, less concrete, order and process. This is difficult, to be sure, but is social life itself a barrier to knowledge, or a means to acquiring it? An historical materialist answer must be to affirm both aspects of human learning and knowing. Burawoy is right in thinking that we are always plagued by partial views of reality, given our limited experience. This makes it very difficult either theoretically or practically to cut through the social thicket to expose the clean, hard lines of a unified "machinery of history." Knowledge is practically limited by our human condition of living lives constrained by place, by gender, class, nationality and race. What this means, however, is that every perspective provides different *angles* on social reality and different *degrees* of truth and falsity--rather than different "realities" and "truths," *tout court*.

To say this, however, is to say no more than that the process of knowledge has a starting point on earth, not in heaven. The social scientist is embedded in society, and has no claim to a uniquely privileged position (Adorno et al., 1976). Her knowledge may indeed be distorted where she sits or stands. This does not mean scientific (i.e. profound) knowledge is not possible, only that it, like all human enterprise, is prone to imperfection. Every bridge built by human hands has flaws, but few have such a weak hold on the reality of material strength, wind vibrations or the force of water that they collapse. Through practical labor we have learned to build suitable bridges. Through the same sort of hard work, including careful observation, gathering of information from a wide range of sources, interaction with the world, reasoned reflection, and discussion with other people, it is possible to inch our way towards valid insights into the workings of society.

Indeed, social immersion is not simply an obstacle to knowing. One is elevated as well as ensnared by the great web of human life. That is, partial or local knowledge can be helpful, despite our tendency to think of it as being disadvantageous with respect to the positivist ideal of complete and pure Truth. For one thing, localism provides close insight into one's own immediate circumstances. Social science has an advantage over natural science by virtue of its embeddedness, because social theorists already have direct access to their subject through personal experience with society, and at least a conventional grasp of categories such as money, father or house (one cannot look into a star so easily) (Sayer, 1984:106). Furthermore, local position gives one specific tools--such as the intimate knowledge of a worker about factory life--by which to think about other parts of the social world.¹⁹ The classic Marxist position that certain social standpoints are revealing of deeper truths than others is still correct, even if every worker does not see his way to a revolutionary socialist position. Paradoxically, Burawoy rejects this idea (1987:65) even though his participant research depends on its validity. Localism also gives one distance from certain social problems. As a Californian I am not deeply embroiled in South Africa's apartheid, in the same way I am with, say, my family. Nor is my conception of apartheid likely to have any significant effect on South Africa without other intervening relations and causes. We are not all Heisenberg giants pushing the social electrons out of their orbits all the time! Finally, we learn the most through the clash of experiences as we move between local or partial situations, or as different groups struggle with each other on the basis on contending position and differing ideology (Buck-Morss,

19. When we use phrases such as structure and surface, essence and appearance, noumenon and phenomenon, there is a danger of driving a wedge altogether between appearance and reality. Empirical knowledge and the understandings gained through direct experience are the ineluctable basis for the growth of knowledge.

1987). This is how we usually confront our own ideological predilections and reach beyond them.

Power and Progress in Social Knowledge

The difficulties of social knowledge do not reside in social difference alone. More fundamental to the ideological distortion of social knowledge is the existence of unequal power and exploitation between classes, genders and races. Burawoy therefore espouses a deep Foucauldian skepticism about the manipulation of knowledge in the interests of power: "Science is mobilized not in the abstract interest of truth but in the concrete interest of domination" (1987:63). This is true, without a doubt. To claim that science is above corruption by the powerful would be naive. Foucault (1979) goes farther, however, to declare that science is so deeply imbricated in the exercise of power that it has no independent existence: hence the term "power-knowledge." This is wrong, even dangerous. Knowledge can be a force for liberation as well as domination, precisely because it is possible to call upon a truth higher than that of the powerful. The truth alone will not make you free, but it can help. (Does Burawoy really imagine that the liberation movements of southern Africa have not been helped by real knowledge of the injustices and depredations of white-settler colonialism?) Indeed, precisely because knowledge is itself efficacious, the powerful take care to use and abuse it to serve their ends. On that point, Foucault is absolutely and brilliantly right, and builds on the foundation of the Marxian critique of ideology. But one must guard against cutting the ideology of the powerful off from its practical roots, and converting knowledge into the *principal* moment of dialectics of power. Power must not merely be thought, it must be exercised to mean anything, and its exercise is material practice. In those practices--whether command of an army or ownership of a hospital--lie the foundations of exploitation. Why else should Foucault have spent so much time considering the depredations of power on material substrate of the human body? The reduction of knowledge to the interests of power is an ideology of total power, as illustrated by the heinous record of fascism and its apologists. Conversely, the reduction of power to knowledge, apart from the practical bases of property, family or state, is the ideology of the powerless intellectual.

Finally, social knowledge does not progress in the same manner as natural science. It must, first of all, try to grasp a moving target, social history; this requires the eventual revision of even the most successful theories. Second, position and contending viewpoints means that social knowledge proceeds not only by theoretical criticism, as in natural science, but by group conflict and political struggle over truths that can be quite painful (Sayer, 1979). Third, faced with the impossibility of escaping from society and social consciousness, advancing knowledge must proceed by using ideology as a lens and as a counterpoint; social science

must be *critical theory* (Adorno et al., 1976). Lastly, social science must, in the end, also be *revolutionary theory* in the sense that the critical evaluation of ideas must confront the practices on which they rest and which they reinforce. In this it must ultimately come to grips with the reality of power and exploitation and thus come into opposition with the ruling class (gender or race) and its ruling conceptions (cf. Sayer, 1984:41-45).

I have argued that knowledge of society can rise above immediate circumstance, turning the hermeneutic circle into an emancipatory spiral (Bhaskar, 1979:202). But social theories are, in the end, bound more closely to the earth than the soaring hypotheses of the astronomer or paleontologist. Because social knowledge is rooted in social practice, and must make the hard climb out of immediate circumstance to a higher viewpoint, it cannot overstep the bounds of social life by too much. The world must change in order for ideas to change dramatically, for us to be given new tools from experience with which to think our way ahead. Therefore, social science evolves not just through theoretical revolutions, but through alterations in human practice that allow people to shed old illusions, experience new realities and provide previously unimaginable solutions to unsolved problems.²⁰ This is the germ of Marx's last thesis on Feuerbach: "The philosophers have sought to understand the world; the point, however, is to change it." On this Burawoy, Wright and I would all agree, in the last instance.

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20. Natural science is also bound in this way, particularly by the observational tools that industry provides it, such as atom smashers, but also in the general conception of the world, as in the mechanical metaphors provided classic physics by the handicraft epoch of the 17th and 18th centuries.

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