"RATIONALITY" IN SCIENCE AND MORALS

by Mary Hesse

Abstract.   Martin Eger's comparison of controversies in science and morals is extended to a consideration of the nature of "rationality" in each. Both theoretical science and moral philosophy are held to be relativist in social and historical terms, but science also has definitive non-relativist pragmatic criteria of truth. The problem for moral philosophy is to delineate its own appropriate types of social criteria of validity.

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Martin Eger has made a convincing case for the existence of a new controversy between currently received views of scientific and moral rationality, and of a new debate about the possibility of demarcating science from other forms of knowledge. He traces an antiparallelism in recent developments in philosophy of science and moral philosophy respectively, of which the main symptoms may be summarized as follows:

First, positivist philosophy characterized science as reliant on formal rules and methods yielding easily arrived at consensus, and as constituting a body of reliably established factual knowledge based on a sharp distinction between fact and value. Post-positivist philosophy, on the other hand, typified by Thomas Kuhn and the "social constructivists," characterizes science as theory- and value-laden, relying on imagination and creativeness rather than rules and methods, yielding a plurality of logically possible theories, and in which consensus is achieved by extralogical and even extrascientific (social, moral, political) considerations. Thus, briefly, our view of science (not least in education) has proceeded from a somewhat arrogant confidence in stable methods and results, to varying degrees of openness, scepticism, and relativism.

Second, moral philosophy, on the other hand, has proceeded in the opposite way. Until very recently moral education has presupposed a Millian liberality in which all rules and systems are open to critical

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examination, and there is an expectation of plurality of conclusions, none of which ought to be suppressed. More recent moral philosophy, typified by John Rawls and the general application of formal game- and decision-theory, has placed renewed emphasis on norms and rule-based calculation to the point where as Eger nicely states it, "any *physicist* can feel at home" (Eger 1988, 307). Briefly, moral philosophy has proceeded from critical openness and scepticism to something more dogmatic at least in terms of the formal structure of moral argument.

The anti-parallelism of these developments takes them from controversy at one end to a mirror-image controversy at the other, and in both cases leaves education in science and morals in a state of confusion and contradiction. It is true that both sides appeal to the "giving of good reasons" and to "truth emerging from critical conflict," and one might naively expect that somewhere in the middle science and morals might be able to find common ground. However, Eger is right to argue that this does not take the matter deeply enough, because the question of what are *good reasons* and what is *truth*, and whether these are uniform or multi-form throughout *knowledge*, is not adequately addressed. The problem is that of the very nature of rationality, scientific and moral.

Eger makes a useful distinction between what he calls the contexts of "education" and of "application," where application is concerned with practical problem-solving, and education with the learner's total orientation to the world. As an example he hints at the controversial suggestion that, while evolution theory is relevant to biological practice in a way creationism is not, nevertheless creationists have a valid point in claiming that evolution theory has a deleterious effect on moral orientation, whereas the Genesis story is a valid moral myth. Creationists might not state it in those terms, but I use *myth* here in its proper anthropological sense of stories that have particular significance: "they are the stories that tell a society what is important for it to know, whether about its gods, its history, its laws, or its class structure" (Frye 1982, 32).

Expressed more generally the context of education in Eger's sense is the context of *knowledge*, and the problem is shifted from the science/morals demarcation to the deeper level of discriminating theory and practice, and analyzing the conditions of validity for each. This is the question I shall briefly pursue here, and in doing so I hope to situate Eger's argument in relation to current discussions of realism and rationality in the realms of science and values.

It should be noticed that Eger's anti-parallelism is not quite symmetrical because on both sides of the modern controversy we have, strictly speaking, forms of *relativism*. I shall argue this presently in the case of

science, which is increasingly recognized to be underdetermined by data and partly dependent on various sorts of intellectual and social fashion. In the case of moral theory, Eger's account may not look like relativism, but there are two considerations that show that it is so.

First, moral theory is often explicitly *structural* in character, and is not intended to entail specific moral prescriptions. For example, Lawrence Kohlberg's influential theory describes the sixth and "highest" stage of moral development as a moral *attitude* rather than a specific set of moral principles. It is formal principles of justice, reciprocity, and equality between individuals that are involved, not rules for particular moral decisions. If one asks what is the justification for these "formal" norms, Kohlberg has no answer except the historical observation that moral philosophy in Western civilization has developed this way, buttressed by appeal to Jean Piaget's conclusion that children's moral sense shows the same sort of progressive development towards the ideal sixth stage.

Second, any application of formal decision-theoretic methods must presuppose some principles that are not formal. For example, in Rawlsian-type moral philosophy there are norms, which are taken to be self-evident in "rational" and "civilized" societies, and these norms have moral *content* as well as formal structure. They favor concepts of distributive justice, equality, and prudence which are patently ethnocentric to Western society, and in that sense relativist. Yet anthropologists have pioneered debates about the possibility of non-Western types of rationality, and it is no longer sufficient to take Western norms as needing no further justification. Good arguments for them there may be, but there are also good arguments, perhaps different kinds of arguments, for the more mythopoeic, authoritarian, and community-based ethics of traditional societies. In memorable rhetorical style, referring to the ultimate appeal to "our" rationality, Hilary Putnam asked "Well, we should use *someone else's* conceptual system?" (Putnam 1975-76, 192). Could there be a clearer expression of underlying relativism?

Relativism is in fact endemic in modern philosophy, both in science and morals. It sets the agenda for any discussion of rational justifications. Within this agenda, the question of justification of scientific theories has been around longer and has been discussed in more detail than in the case of moral theory, and so we may hope to use it as a model, both positively and negatively, for moral rationality. It is convenient to begin by considering the distinction between theory and practice in the analysis of scientific reason.

It is generally agreed that there *is* something special about scientific knowledge that characterizes its specific form of rationality. At least part of this specificity has to do with its practical success and its progres-

sive extension of this success to wider and wider domains of natural phenomena. Given the complexity and social expense of modern experimentation it would be foolish to deny that science is at least partly justified by the fact that it delivers the goods—it is subject to control by empirical evidence, tested by its success or otherwise in empirical prediction. The objectivity of such texts is validated by the fact that they can *surprise* us, and eventually overthrow the most cherished theoretical structures. This is the hard edge of pragmatic objectivity within science that distinguishes it, in this sense, as a more cumulative form of knowledge than any other in the history of thought. In this sense everyone is a "realist."

The question that divides realists and antirealists in modern philosophy of science is the relative importance to be attached to this type of pragmatic or instrumental success, as against the aim of acquiring true, cululative, and universal *theories* about nature. The view that science is in essence merely pragmatic appears to devalue its significance, and realists point out that good science has always required more than instrumental success. Other criteria come into play, including the aesthetic appeal of coherent, universal, and elegant theories, and the sheer delight of unravelling complex puzzles. The important question, however, is whether theory also gives us laws and descriptions of the real world, and whether these get progressively nearer to the truth. In the light of changing paradigms throughout the history of science, and of studies of the interactions between science, intellectual culture and social pressures, it is increasingly difficult to accept that scientific theory yields knowledge in this ultimate sense. The progressive character of science lies in its particular, localizable, predictions, and their pragmatically successful outcomes. Its basic pictures of the world are *models* that evolve and change, sometimes very radically, and show no convergence to a unique theoretical truth. As an example one may think of the changing pictures of matter throughout physics: from atoms and the void, to continuous distributions of energy through space-time, to the current particle-field interpretations of quantum physics, where fundamental models come and go with bewildering rapidity. Mathematical structures may be preserved through such changes, but answers to the substantial question "What is matter?" are not.

This situation has two consequences for the relation between science and values. First, there is no doubt that value-implications are inseparable in practice from the theoretical models accepted in science at any given time. Atoms-and-the-void have traditionally been associated with a materialistic view of physical nature, where apparently regular behavior is in fact based on pure chance, and consequently with a

mechanically reductionist view of human nature. On the other hand, at various periods astronomy and scientific cosmology have required some kind of "design" in nature, from Isaac Newton's God who kept the planets in their orbits, to modern "anthropic principles." Such theoretical models appear more congenial to theistic or spiritual interpretations of the world. Whatever their implications may be from time to time, the crucial point for a relativist philosophy of science is that they are never conclusive nor permanent because they may be reversed by the next change in theoretical paradigm. It is therefore rash to try to derive value systems from scientific theory, even in the form of temporary apologetics. Any such conclusions are in constant danger of being undermined by theoretical developments whose objective rationale takes no account of their contingent value-implications.

Second, the pragmatic account of science poses difficulties for claims to knowledge that have no clear constraints of practical success to control their theorizing. The apparent symmetry of scientific and moral relativism breaks down at this point. For the sake of argument we may accept a sort of moral relativism which is parallel to theoretical relativism in science; that is, we may wish to regard moral systems as internal to the cultural and social pressures of a given society, subject to historical evolution and change. Even so, we have no explicit institutionalized constraints upon such moral change. We cannot test and compare the social and psychological outcomes of different moral systems against overriding and generally acceptable success-criteria, if only because the adoption of the success-criteria themselves are moral judgments. The outcome of easier divorce may be shown to be increased happiness for a certain proportion of divorcees, increased misery for others, and disruption of children's right to a stable family background. To weigh the positive and negative success-value of these outcomes is another moral exercise, and such problems are bound to ramify in the consideration of any serious moral issue.

To recognize these asymmetries, however, brings us back to the pragmatic criterion of science itself. Why did such a criterion ever become accepted as the touchstone of true knowledge in the first place, and how did every other knowledge-claim come to be seen beside it as subjective and arational? The answer lies primarily in the history of seventeenth-century Europe. For example, in the origins of the Royal Society it is clear that there was a conscious decision to adopt a mode of inquiry that was seen to have determinate results and to be relatively certain, one that evaded social and religious controversy, that was accessible and democratic (as Francis Bacon stated it, it "levels men's wits"), and that disposed of superstition, magic, astrology, and false (mainly Aristotelian) philosophy. In other words, the adoption of the

distinctive style of scientific argument with its experimental tests was itself a largely *moral* decision, a decision for "objective" fact uncontaminated by "subjective" value, for plain linguistic prose in place of high-flown metaphor and rhetoric, for observable description in place of transcendental myth.

This whole complex of decisions was momentous for human history. That it was socially possible at all must be explained by a certain schizophrenia in the seventeenth-century mind—a Cartesian dualism between the natural and the mental and moral, and between science and theology. The social myths based on western theism were not seriously undermined for another century or two. Our current problems are the outcome of their eventual collapse, and unfortunately for us new social myths cannot be created to order in our kind of society. Perhaps the first step in trying to reconstruct our social and moral fabric is a negative one: to recognize the historically contingent and temporary character of our obsession with science as the norm of knowledge, to question its iconoclasm and restless search for progress and universality, and to recover a sense of the particularities and traditions of particular societies and their need for their own forms of social cohesiveness.

This conclusion is in close agreement with Eger's own, but as he remarks, its practical application remains to be worked out. We do indeed need to apply critical reason to tradition in morals as well as in science—this is an inescapable legacy of the "rational scientific method." However, philosophical critique should be directed as much to the presuppositions of different applications of rationality as to the content of scientific theories or moral norms. In the end society inevitably defends itself against its own disruption, and throws up its own moralities. Philosophers and educators can do little more than accept with realism the need for power and authority to be recognizably located within society, while exercising critical restraint on its excesses and those of the moralities it espouses.

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