



The alleged demise of science: a critical inquest

The alleged
demise of science

Donald J. Willower

Pennsylvania State University, Pennsylvania, USA, and

Cynthia L. Uline

Ohio State University, Columbus, Ohio, USA

455

Keywords Education, Administration, Philosophy

Abstract Examines the alleged demise of science in terms of claimed difficulties including: the human limitations of scientists, that science seeks ultimate reality and universal truth, oversimplifies complexity, and accepts no standard external to itself. Also considers incommensurability, the theory ladenness issue, and the assumption of orderliness. Overall, there is little discussion of epistemological issues in the sense of exploring pros and cons, while the resurrection of positivism and its equation with science and “big tent” thinking that confers legitimacy on every interest group’s position regardless of its cogency, further degrades discourse. The naturalistic-pragmatist perspective presented as an alternative sees scientific inquiry as an open, growing, fallible activity that has proven far superior to other methods of problem solving. Inquiry is also taken to be central to principled moral choice and to efforts aimed at improving people’s lives.

An inquest ordinarily seeks to determine the circumstances and causes of a death. We call the present effort a critical inquest because we intend to examine an alleged demise. We are interested in the fatal attributes perceived by those who claim that science has suffered demise, decline and fall, collapse, repudiation, invalidation or a like fate. The terminology varies but suggests flaws so fundamental as to discredit science and its methods. Obviously, metaphors can be misleading. In this case, they stem largely from the decline and fall language used by derogators of science (e.g. Greenfield, 1986). However, our critical inquiry actually is a matter of exploring the mortal defects attributed to science by its antagonists.

Science bashing and big tents

While science bashing has become a popular pastime in educational administration, as it has in some quarters in the social sciences and humanities, much of the discussion has been inattentive to the kinds of questions explored in philosophy and to the history of that discipline. In educational administration, examples range from Greenfield’s use of the term phenomenology in a way that ignored that view’s philosophical origins in the work of Edmund Husserl to Donmoyer’s (1999) recent reference to Richard Bates as Greenfield’s “intellectual sidekick”, lumping together two quite different traditions, subjectivism and Marxian critical theory. Donmoyer then argued that Bates’ conception of knowledge as inevitably political is supported by an array of disparate scholars from Kuhn through Habermas to Foucault and Lyotard. This strategy may be misleading in the absence of treating

substantive issues in theory of knowledge. Discussions of the psychology of doing science and of cross-cultural differences, followed by an elaboration of the politics of the big tent, whereby every viewpoint is given a kind of parity, falls short.

As Donmoyer recognizes, the problem here is that all views are not equally plausible. Further, a big tent strategy cuts off the kind of rigorous thinking and debate that gives a field of study its intellectual zest and potency. We believe that an exploration of the alleged flaws of scientific inquiry can help to clarify current controversies in a substantive way, and provide a philosophical framework for scholars who find some of these controversies enigmatic, and even disconcerting. We attempt to cover the main criticisms of science, most of which are longstanding, not new as some appear to think.

Flaws, foibles, and fantasies

Science as all too human

The first alleged flaw of science is a simple one that helps set the stage for discussion. It is that scientists cannot be sufficiently objective, that they are likely to see what they hope to see and, in some cases, even deliberately distort their observations and results. This boils down to the indisputable proposition that scientists are human beings, with the usual range of individual flaws and strengths.

Patently, it needs to be emphasized that science is a human creation, not something handed down from on high. That some investigators fudge evidence, that there are disputes over origination of ideas and primacy of discovery is well known (see, e.g. Mitroff, 1974). Indeed, this is one of the reasons that, over time, the norms of science have developed. These norms differ somewhat in emphasis depending on the discipline, but generally are geared to skeptical openmindedness, impersonal criteria of evaluation, and public communication of results (Merton, 1973; Zuckerman, 1988). Most scholars understand objectivity as an ideal; the notions of controlling for biases or being open and explicit about them are common prescriptions enforced by the possibility of peer criticism.

The focus here is on human limitations, often cast in terms of the lure of enhanced reputation gained via successful inquiry. In recent years, advocacy for particular causes, often joined with reputational concerns, has become one of the more salient barriers to even-handed assessment. In any case, "the all too human" criticism applies to every activity, including those that, like scientific inquiry, seek enhanced understanding. For example, intuition as a method seems particularly vulnerable to bias. It is no accident that the strength of Edmund Husserl's phenomenology is the careful elaboration of phenomenological methods (Farber, 1943), a point ignored by some advocating phenomenology in education, who seem innocent of Husserl's work and of phenomenological methods. The general idea is that methods that seek better to understand humankind and the world should emulate science and make

efforts to reduce and control bias and distortion. Phenomenological methods seek to do so in terms of that framework.

A broader lesson is the recognition of the limitations of the human condition. Historically, the record is daunting. It includes oppression and slavery from ancient times, wars of conquest that showed no quarter to those considered enemies, the evils perpetuated in the name of religion and its dogmas and myths, to the more recent monstrosities committed by governments subscribing to Nazi, Fascist, or Communist doctrines, to today's ethnic tribalism used to nurture and justify hatred and barbarous behavior toward other groups. Common to malefic movements in history have been mindless commitments to dogmatically given and held beliefs that supposedly justify malevolent acts.

Obviously such thinking stands in sharp contrast with the openminded skepticism, and respect for evidence and reflective explanation that is at the heart of scientific inquiry. The attitudes and temper of inquiry are virtual opposites of those that have fueled oppression and pernicious actions. Nevertheless, a well known criticism of science is that its results can be used in the service of both good and evil purposes. The latter has occurred in cases from weapons of mass destruction to advertising that uses psychology to create pressures for consumption of the unneeded to "spin doctors" whose job it is to shade meanings to make bad policies look good. The latter two are significant as archetypes for the kind of manipulated communication that threatens wise choice in modern societies and can lead to larger evils.

As we have already suggested, techniques that look away from evidence (e.g. about a policy or a product) are inconsistent with the methods of science. While granting that the results of science can be put to ill use, it is legitimate to ask whether the great benefits conferred on the human race by science outweigh the negatives. It would not be easy to argue to the contrary given the huge strides made across disciplines that have been helpful to people with a variety of problems. Further, even if the call were closer, that would not be a reason to curtail beneficial scientific inquiry. Two final points about the "all too human" problem. First, the emotional and sometimes irrational side of human beings is not foreign to science. The psychological sciences have long documented and furnished insights and explanations about such phenomena. Second, an ethics of inquiry, consistent with science and its methods, can provide a worthwhile perspective on the problem of science in the service of good and evil. Such an ethics will be elaborated later.

Ultimate reality and universal truth

Related criticisms of science are that it seeks ultimate reality and final, universal truth and since neither has been demonstrated, science is flawed. Such criticisms are misleading because they are so blatantly incorrect. As an open, growing activity, one of the main characteristics and great strengths of science is its self-corrective nature. In science, there are no final or universal truths, only theories that can be assessed using a variety of logical and

The alleged
demise of science

evidentiary criteria, and subject to modification or replacement at any time. Similarly, the notion of an ultimate reality waiting to be uncovered and revealed by science is long out-of-date, a vestige of nineteenth century scientism.

Yet, both of these charges are sometimes laid upon science by critics, with postmodernists/poststructuralists (Derrida, 1973, 1976) but one example. Little more need be said about final, universal truth, except to stress that even the most established theoretical explanations are subject to self-rectifying inquiry which might provide even better established ones.

Ultimate reality is an awkward term that conjures up images of scientists pulling away the curtain of ignorance to gaze upon the true world. The terms ultimate reality and universal truth in a sense feed on each other because presumably to see the former is to know the latter. The problem is that such a conception of scientific inquiry is a figment of the postmodern imagination in search of a straw man. What actually happens is that a theory is created and tested and if the evidence fails to reject the theory, it gains in credibility. Theories are genuine constructions, but their assessment depends on judgments of adequacy using criteria developed in scientific communities. Theories supported by logic and cumulative evidence over time achieve relatively high levels of credibility, but words like ultimate reality and final truth are foreign to inquiry, found mainly in the conceptions of science provided by the fantasies of its antagonists.

If the hyperbole of critics is set aside and one looks to the history of philosophy, a correspondence theory of truth and philosophical realism are two traditional positions with some relevance. The former is simply the idea that truth is a matter of the correspondence of theory and reality. Correspondence was usually contrasted with coherence, a view that saw a theory's coherence with established theories as a test of truth, although the term coherence was also used to refer to a theory's internal logical consistency. In any event, both of these views were too narrow as an examination of treatments of theoretical adequacy makes clear (e.g. Larrabee, 1945). The usual criteria of adequacy include logical consistency, fruitfulness, scope, explanatory plausibility, coherence with past results, parsimony, testability, and predictive power, with the latter usually considered the acid test. Such lists show the limitations of both correspondence and coherence theories. The former is also vulnerable because it stressed the match of theory and reality, while science is about the match of theory and observations. The latter has an additional weakness in that it is unreceptive to theories that break dramatically with currently established ones.

In educational administration, Evers and Lakowski (1991) have called their emphasis on the kinds of criteria of theoretical adequacy used in science "coherence theory." This might be confusing to those familiar with the correspondence/coherence dichotomy. Their position is also unusual in that they emphasize "extra-empirical" criteria, relegating predictive power, probably the strongest criterion, to a separate category, presumably because of

their concerns about naïve empiricism, which we see as a dead issue. In addition, they ignore the difficulty of applying such criteria to a particular theory. That task can be a very general one, requiring broad and perhaps debatable judgments. Evers and Lakomski's work is a valuable contribution to philosophical thinking in educational administration, and their views are in the same broad naturalistic camp as ours. However, we believe they are mistaken in their over-confident conception of science which emphasizes physicalism and grand theory, while deemphasizing the mix of empiricism and middle range theories that have been the backbone of progress in inquiry, particularly in the social sciences.

We turn now to philosophical realism, which posits, among other things, an underlying reality independent of knowers, or of mind, as some philosophers put it. That problem is straight forward. The world cannot be observed without an observer, hence it is not possible to have direct experience of the world independently of mind. Despite this, there is compelling evidence from a number of fields that there is a real world that would exist if humans were no longer part of it. Nevertheless, it is the methods of science that sustain its always tentative inferences, not philosophical realism in any of its forms.

A final point in connection with "reality" is a brief exploration of the notion of the social construction of reality. That view, which can easily end in epistemological relativism (Phillips, 1995), correctly sees knowledge as constructed. It is when every construction is taken to be as good as every other construction that errors begin to compound. As seems obvious, some constructions of "reality" are better than others, that is, less prejudiced, more open, more accurate, more reasonable. The postmodern concept, adopted by some in identity politics, that people and cultures have their unique ways that must be given epistemological standing opens the doors to every kind of bias, intolerance, and superstition. Just as in inquiry, some theories are better than others, so in life some versions of "reality" are better than others.

In this section we have shown the futility of arguments that associate science with ultimate reality and universal truth. In addition, we have attempted to explore a number of related ideas from philosophy. There we acknowledged the plausibility of the notion of a world independent of mind, but since scientific inquiry is a human activity governed by norms developed over time, we do not consider philosophical realism to be germane to that enterprise. Science is concerned with experience and observations, not with an independent "reality." Theories suggest further observations and none of the criteria used to assess their adequacy depends on some sort of extrinsic reality, not to mention an "ultimate reality."

When it comes to truth, we prefer Dewey's (1938) concept of warranted assertibility. It holds that propositions are warranted by logic, and by evidence gathered in the process of inquiry. This view is consistent with scientific practice and is antithetical to universal or final truths. It sees science and knowledge as open, changing, and growing, not as closed, static, and settled.

Complexity and simplification

A familiar criticism of science is that it simplifies the phenomena it investigates and is unable to do justice to their complexity. There is some basis for such a criticism in the sense that concepts, including those used in scientific inquiries, tend to simplify their observational referents.

Science simplifies, ideologies simplify, affective and cognitive thinking simplify, language simplifies. Experience is rich, and making sense of it attempts to get at its critical features in terms of a particular problem or focus. Postmodernists/poststructuralists reject all attempts to theorize believing that theory ignores what Derrida (1976) calls *différance*. They call abstract theories metanarratives, and their rejection of them includes scientific and ethical ones as well as ideologies.

While it is tempting to explore the difficulties their position has created for postmodernists/poststructuralists (see Willower, 1998), the issue at hand is whether complexity is fatal to science. We have already suggested that experiences are apprehended by simplification. Comparatively, the kind of simplification science imposes on experience seems carefully hedged. The theories used to comprehend experience are taken to be tentative and subject to critical assessment via further observations. These considerations are also an effective response to the related objection that observation is theory laden and hence flawed. Put in that language, a relevant point is that, in the process of inquiry, observations laden with some theories will turn out to be better than those laden with other theories. At the same time, it is well to keep in mind that scientists commonly subscribe to the norms and processes used to control bias, as explored in our "all too human" discussion.

One kind of simplification that is sometimes associated with science, requiring some clarification is reductionism. Reductionism is the notion that work in one scientific area can be reduced to that in another, with a typical illustration, the reduction of certain human behavior to chemical reactions and the reduction of chemical reactions to the behavior of molecules, atoms, or other particles studied in physics. Of course, pulsating waves of energy is a possible alternative, which may be awkward for traditional philosophical realists and materialists, used to thinking in terms of matter as a more stable substance.

While half a century or so ago reductionism was seen as a promising possibility that might result in more rigorous science (e.g. Carnap, 1949), today it makes more sense to treat reduction in concrete terms rather than broader ones. This means that the general concept of reduction is treated skeptically, with an emphasis on specific problems and results. A well known example would be efforts to understand psychological problems such as depression in biochemical terms, an approach that has had some positive results. Still, most social sciences have not been transformed by theories from the physical sciences, and the kinds of explanations developed within the social sciences seem reasonably successful when it comes to understanding human behavior. The proper stance, one characteristic of science as an activity, is openminded skepticism. A current instance of interest in educational administration is the

work being done by students of cognition to examine the mental processes used in making complex decisions (Evers, 1998). The utility of this line of inquiry, sometimes called “brain research,” for gaining a clearer understanding of administrator choices in the contexts of their organizations, remains to be demonstrated. The general conclusion on reductionism is that it has not been relevant in major ways in the social sciences, despite the hyperbole sometimes used by its proponents. At the same time, few deny the fundamental importance of biology to human behavior and there might yet be impressive breakthroughs from that or related quarters that will furnish new insights. Meanwhile, the theorizing and empirical research done within the social sciences continues to be their most important contribution to scholarship.

Returning to the broader issue of comprehending complexity, it seems clear that the problem stems in large part from the limitations of the human condition and the necessity to simplify experience in order to make sense of it. The methods of inquiry make allowances for this and are geared to criteria that facilitate judgments about the plausibility of descriptions and interpretations of experience. In this, science appears to do a more credible job than other ways of sense making.

Science and external standards

A classical question regarding science is whether it requires an external standard of some sort. The usual formulation is that science must be grounded in something beyond itself. Otherwise, it is held, arguments for its justification are circular since they are self-referential.

Those who believe science must be anchored in a foundation outside of itself commonly invoke one or another version of philosophical realism, grounding science in a real world which its methods supposedly reveal. A variation is found in Quine and others who distinguish between a theory of evidence and a theory of truth. The former consists of the usual criteria of theoretical adequacy discussed earlier, the latter embodies a form of physicalistic realism much like correspondence theory. Evers and Lakomski (1991) endorse this view, while like Quine, presenting elaborate arguments rejecting foundationism.

The evidence/truth distinction is awkward because it appears to be an attempt to have one’s cake and eat it too. Far more defensible is the Deweyan definition of truth which in effect defines it as the best available outcomes of inquiry. Further, we do not see physicalism or philosophic realism as necessary to the justification of science. Science is, after all, a human creation and activity, grounded in reason and experience. Its theoretical explanations are treated as hypotheses and how they fare in the process of inquiry is a public matter. Their consequences in that arena are critical to their assessment, as philosophers with a pragmatist bent have long asserted. All of this is carried out by people in the context of procedures developed by people.

If specific propositions in science are “justified” through inquiry, what more is required? The baggage of philosophical realism as a grounding adds only an unneeded set of assumptions, that typically jump from the existence of a world

external to mind, which we saw as a low inference proposition, based on the evidence, to grand but unjustified conclusions about ultimate reality and truth that pervert the scientific enterprise. We contend that science needs no external standard outside of its own demanding, self-corrective processes. If such a view is circular, itself debatable, then circularity is, in this case, a trivial and misplaced formality, dramatically countered by the power of the methods of inquiry and the scope of scientific accomplishments.

Orderliness

A common comment is that science depends on an assumption of orderliness, that is, that the subject matter of its observations and theories will exhibit patterns of regularity. This appears to be a reasonable comment because if randomness and chaos rule, there could hardly be meaningful inquiry, let alone cumulative inquiry. At the same time, the question of orderliness is an empirical one, and the history of science, including that of social science, demonstrates a considerable degree of regularity which is given meaning in the form of the various explanatory theories in each of the special disciplines. These theories provide insight and understanding concerning their subject matter, but can also help to facilitate a variety of worthy purposes such as stronger, more versatile materials for human use, better health and healing, organizations with greater problem solving capabilities, and more effective teaching and learning.

For those tempted to invoke chaos theory to support arguments for disorder, it need only be pointed out that chaos theory seeks order in intricate, unusual, or odd patterns. Such a search may actually require very fine tuned observations. Griffiths *et al.* (1991) assert that the need for very precise measures in chaos theory has limited its applications in educational administration. Intricate patterns actually are well recognized in science. Threshold effects, dialectical change, and statistical regimens that deal with the interactions of many variables are a few examples of efforts to deal with them.

In the end, order as we know it results from the interaction of mind and experience. The issue for science is whether there is enough order to justify inquiry as an activity. As we have pointed out, an affirmative answer to that question is quite clear.

Incommensurability

Kuhn (1970) and others have discussed incommensurability. This concept refers to the incompatibility of viewpoints, with the implication that each should be judged by its own criteria. Kuhn, however, used it mainly to explore the differences between scientific theories. In administration, the concept has been popularized by Burrell and Morgan (1979) who devised a classification scheme that placed all organization theory in one of four categories: radical humanism, radical structuralism, interpretive, and functionalist. This simplistic scheme lumped diverse, even oppositional theories together. In particular, their functionalist label ignored the substance of sociological

functionalism, using the term to include almost any theory oriented to scientific inquiry.

Apparently, one of their purposes was to promote the doctrine of incommensurability, as suggested by Clegg and Hardy (1996), who are sympathetic to their views. Clegg and Hardy explain that Burrell and Morgan wanted to “carve out a protective niche where ‘alternative’ researchers could do their thing, protected from the criticisms of functionalists, free from the necessity to explain their work to them” (p. 5). Willower and Forsyth (1999) contend that Burrell and Morgan’s desire to divide scholars into independent, presumably non-communicating camps, is antithetical to norms for open communication and critical discourse that are so central to scholarly inquiry. They also suggest that standards of assessment that ignore logic and evidence are likely to have credibility problems.

In a larger context, there have always been questions that remained mysteries, not resolvable by science methods, nor for that matter by any other method, suggesting to some a form of incommensurability with a supernatural twist. Still, the distinction between the unknown and the unknowable should be kept in mind. The history of science is full of instances of the replacement of superstitions by credible theoretical explanations. At the same time, issues such as the existence and nature of God, immortality, and the like have been the objects of philosophical speculation since the time of the Ancient Greeks and of the myths and doctrines of diverse religions. Usually, the latter rely on faith, authority, or intuition to ground beliefs. A problem with such grounding is that it can be used on behalf of diverse or even contradictory views, as each party continues to privilege its own credo. Beliefs about the unknown can, of course, be comforting and can also sustain moral views. Indeed, the Kantian argument for the existence of God portrays the deity as the source of human concerns for morality and goodness, just as the orderliness that scientific theories suggest, has figured in forms of the argument that depicts God as a supreme designer and creator.

Burrell and Morgan, however, have a far narrower subject matter. And it is a blatantly partisan one. Burrell, who sees himself as something of a postmodernist-poststructuralist, for instance, charges that “Modernism is about the death camps . . . even though its apologists seek to distance the likes of Auschwitz from the achievements of modern society based as it is supposedly on critical inquiry. . .” (Burrell, 1996, p. 656). Burrell’s far fetched charges are based on a political agenda, not on evidence. His feckless views provide a glimpse into the consequences of the doctrine of incommensurability, were it to become widely accepted, namely the substitution of an academic version of a Tower of Babel for critical discourse that appeals to logic and evidence.

Our exploration of incommensurability suggests the limitations of that concept which are related to the assessment of ideas, not to their generation. Science is open to all views and concepts. Creation has an anything goes element. Clearly, new ideas are the life blood of inquiry, but equally important

The alleged
demise of science

is their appraisal. The spirit of genuine scholarship is to craft an idea, and then to subject that creation to as critical an assessment as possible. Small wonder that incommensurability is a favorite of political ideologues and others who do not want their ideas to be examined critically.

Bad history, uncritically accepted

The foregoing discussions of criticisms leveled at science and its methods demonstrate the limitations of the criticisms. None seems to have inflicted fatal or even disabling damage. Most epistemological questions are many sided, and too much of the debate about them has been simplistic.

Part of the problem is that in educational administration, and in a number of other disciplines as well, the critics of science have framed recent intellectual history. Generally they have produced bad history, guided by their particular political ideologies and objectives. Many authors in educational administration seem to have uncritically accepted the sloganistic treatments of science provided by critical theorists, postmodernists-poststructuralists, some committed to identity politics, and others.

A prime example is the pejorative use of the term positivism, which is falsely equated with science. As Phillips (1992) pointed out, “antipositivist vigilantes” (p. 95) still see it everywhere, despite its demise long ago. A recent example is found in the chapter by Chapman *et al.* (1999) in the second *Handbook of Research on Educational Administration*. While other sections of this chapter are quite cogent, the part devoted to philosophy paints positivism as “orthodoxy” in educational administration until the 1970s. Yet, an examination of the literature in educational administration during the time in question (Willower, 1996) showed little substantive attention to positivism or to sociological functionalism, another view alleged to have been dominant then. Oddly, the chapter (Chapman *et al.*, 1999) also cites work that criticizes and rejects logical positivism, but is favorable to science. What is odd is that this work substantially predates the period when positivism was alleged to dominate educational administration, but the chapter’s authors appear to believe that scholars in educational administration were influenced by the work of Schlick, Carnap, and other members of the Vienna Circle (1923-1936), but not by John Dewey’s (1922, 1938) seminal views on inquiry.

Positivism has not been a serious contender in philosophy for many decades. It was referred to only briefly and critically in Dewey’s *Logic* (1938), his master work in philosophy. Writing in 1964 on knowledge, values, and practice in educational administration from a generally naturalistic-pragmatist perspective, the first author of this article did not even mention positivism, considering it dated in philosophy and unimportant in educational administration (Willower, 1964). This, at the very time of positivism’s claimed domination.

It seems likely that most of the active scholars in educational administration simply did their research, without much regard for philosophy of science. They attended to the norms of science, making efforts to design their empirical

studies to enhance their credibility and to develop plausible theories to account for their findings. Smelser (1988) indicates this is roughly what occurred in sociology, a discipline educational administration often reflects.

The alleged
demise of science

The practices of most researchers in educational administration appear to have been reasonably consistent with the proscience, antipositivistic views of Dewey, Karl Popper or W.V. Quine, work available long before the alleged positivist domination of the field. Positivism with its emphasis on unified science and reductivism actually seems less consistent with those practices, but efforts to make connections to these alternative philosophies never took hold.

465

We have suggested that the positivism label has been promoted by those hoping to discredit science. Other ready explanations seem implausible. Surely, no scholar is naive enough to ascribe philosophical positivism to those who do quantitative studies or explicate operational definitions, which are essential, whether explicit or not, to even the most personalistic qualitative work. It might be added here that qualitative studies, in sociological or anthropological modes, have been part of empirical research in educational administration at least since Boyan's (1951) investigation almost 50 years ago. A recent twist in qualitative approaches is their use to advance political ends as in "critical ethnography". This sort of work, which seeks to validate ideology rather than develop grounded theory, can only benefit from the dismissal of scientific inquiry as positivistic.

In any case, it appears that positivism is a straw man for some, as well as a convenient crutch for the philosophically uninformed and those not interested in pursuing the matter critically. This may have abetted the uncritical acceptance of bad history, but also was a symptom for lost opportunities for substantive discussion. Despite the disputes in the field, there has been very little interactive debate, nor for that matter, very much reflexivity, the term G.H. Mead used for self-critical awareness. It is rare to find antagonists squaring off in the same publication and very few scholars have discussed the weaker aspects of their positions, although every view has such weaknesses. While the September 1998 issue of *Journal of School Leadership* was an exception, featuring a pro-con debate on postmodernism, the August 1998 *Educational Administration Quarterly* on that topic had no con side, and very little discussion of the substantive elements of postmodernism-poststructuralism. The main features of that perspective, the rejection of a "metaphysics of presence," and of all metanarratives, and its emphasis on text and words and their deconstruction, were mentioned not at all or only in passing. Three of the issue's six articles were narrative type studies of disadvantaged groups or schools, but specific connections to postmodernism-poststructuralism were not explicated materially.

Much of the writing of subjectists, critical theorists, and postmodernists in educational administration has been far more negative than positive. It is clear that most of them are against science as they (usually incorrectly) define it, the critical theorists stress equity and the subjectists humane social relations, but so do naturalists and pragmatists, the real issues being in the particulars.

Postmodernists face the problem of the nihilism that pervades that perspective. The rejection of metanarratives includes the rejection of all abstract theories, including normative ones. All such theories are believed to “totalize” and ignore difference. With theories that seek to understand and improve the world disallowed, all that is left are texts which are to be deconstructed or examined for assumptions and especially how they oppress “otherness,” by what is said and not said. Largely, deconstruction has been radicalized critique, which is why some critical theorists find aspects of postmodernism-poststructuralism attractive. Foucault (e.g. 1980) whose writing is mainly about power and control is often cited by them. This kind of deconstruction also provides opportunities for postmodernists who have difficulties with the treatment of utopian ideologies as metanarratives. Even Derrida (1994) appears to favor this sort of radicalized critique.

It was not our intention here to examine all of the assumptions, methods, and positions of subjectivists, critical theorists, some in identity politics, and postmodernists-poststructuralists. Rather we attended to those aspects of these strands of thought that bore on scientific inquiry. However, we regret that so much of their effort has been devoted to attacks on straw men and how rarely they joined issue with genuinely formidable naturalistic-pragmatist approaches to epistemology and science.

Ethics and scientific inquiry

Science and scientists have been subject to stereotypes. The hirsute, mad scientist and the robotic, data driven individual devoted only to facts and certitude are well known ones. Science is also taken to task because its results can be used to serve evil ends. As promised when that point was raised earlier, we turn here to science and ethics, not in the sense of standards applied to scientific activity, but in terms of the relationships of the methods and subject matter of science with moral choice.

The view of ethics taken is influenced by Deweyan thought (see Willower, 1994a), but differs in its emphasis on the process of valuation. The general position is in the naturalistic-pragmatist tradition which sees inquiry in ethical matters as essentially similar to inquiry in science. Both begin with a problem and employ scientific methods aimed at problem resolution. Moral problems arise in concrete situations where values clash, whether it is a matter of choosing among several desirable courses of action, when resources will support only one, or between the welfare of one person or group versus that of other persons or groups, or a matter of trying to move oneself or one’s group or organization towards a more desirable future.

Here we adopt the usual social science definition of values as conceptions of the desirable. The Deweyan distinction between desire and the desirable sees the latter as a function of the mediation of reflection or deliberation, terms that in Dewey are roughly synonymous with inquiry and scientific methods (Willower, 1994a, b). Such methods can help to resolve the problems of everyday life, moral and otherwise. Reflection and deliberation rather than

momentary desire and whim are keys to wisdom. The methods of inquiry and science are not esoteric, they “simply exhibit free intelligence operating in the best manner available at a given time” (Dewey, 1938, p. 535).

The alleged
demise of science

Ethical theories often ignore the contextual features of moral problems, reducing them to pre-given principles that are taken to exist, in a Platonic way, independently of existential circumstances and the complexities of many moral issues, where choices might well spawn new moral dilemmas. This is especially so in the case of the kinds of problems faced by school administrators. Some archtypical moral problems in school settings include those in which the welfare of two sets of individuals or groups clashes. An example is the veteran teacher who has served faithfully and well, but because of illness, has become less effective. A second kind of example is any effort to make changes in the curriculum and in instructional methods deemed likely to improve the education of students (see Willower and Licata, 1997).

467

These are common examples in education and like all moral problems they take place in a web of existential circumstances. Efforts to behave in a principled way, for instance in the first case, to strive to guard both the welfare of the teacher and the students in that teacher’s class, have to be played out in the context of the particular contingencies involved. The likely consequences of proposed courses of action need to be thought through and potential negative consequences minimized where possible, even while the main attention is given to the broader choices. This kind of work is what has been called valuation. Values without valuation are relatively meaningless in terms of doing something about moral problems, however comforting right values may be to hold and, for some, to espouse, as if commitment were the same as accomplishment and caring were the same as helping.

The truth is that there is wide agreement on values in the abstract in most civil societies. Compassion is favored over cruelty, liberty over oppression, love over hate, independence over dependence, fairness over favoritism, to give a few examples. Principles take the form of injunctions to behave in accordance with such values. While subjectivists in the tradition of idealism argue that some principles are absolute (e.g. Hodgkinson, 1994), the naturalistic view is that principles stem from cumulative ethical experience with certain of them gaining credibility over time by proving useful in the solution of moral problems (Dewey and Tufts, 1932). In this view, principles serve as standards and guides, but not as absolutes. Fixed and pre-given principles are antithetical to an inquiry based ethics because they deny both the possibility of learning and growth in ethical knowledge and the complexities of moral choice where what are claimed to be absolute principles sometimes compete with one another.

While abstract principles serve wonderfully well as guides and can even have an inspirational effect, it is only in real situations that they become operational, with the potential of actually helping other human beings. The notions of social justice and “emancipation” enunciated by critical theorists serve to illustrate. As is typical with abstract values, justice, fairness, and

equity are virtually non-controversial. Suspicion of neo-Marxist views, of which critical theory is one version, is stirred by the monumental failures of Marxist-oriented governments, overthrown in Eastern Europe by the very working classes they purported to champion. These governments were, in effect, oppressive dictatorships of the left and serve as warnings against dogmatic political ideologies which have pre-given answers and do not offer their programs as hypotheses to be criticized and tested. Davies (1995) has pointed out that Marxist tradition projects the movement's political aspirations as objective interests of disadvantaged groups, no doubt one of the reasons that critical theorists have not been hesitant about becoming self-appointed spokespersons for the "silenced" or "voiceless." For critical theorists, political ideology serves the same purpose absolute values do for subjectivists and idealists (Willower, 1999). Both views deemphasize inquiry and especially the scientific temper, a skepticism toward panaceas and preordained answers.

To continue with illustrations from critical theory, a central issue in programs designed to promote equity is the extent to which they also promote individual growth and the ability to deal with problems. Dewey, for instance, rejected social welfare in the form of "soup kitchen happiness," arguing for wider horizons that give individuals command of their own powers to find happiness in their own fashion (Dewey, 1922, pp. 293-4). He was skeptical about "experts" and one can only speculate about his reaction to contemporary advocates who stress victimization. Critical theory lacks a social philosophy grounded in ethical theory that would enable it to look, for instance, at unintended consequences or other flaws in its program. It is preoccupied with a political ideology that posits a unitary and oppressive ruling class, a dated view in terms of modern pluralistic politics. So also is its call for radicalized teachers who struggle in the interest of an "emancipatory vision," countering entrenched power reflected in schools in texts, curricula, and other practices and policies (Giroux and McLaren, 1987). This call seems simplistic and sloganistic, detached from the real problems educators face.

The examples of doctrinal ideology suggest the contrast between such perspectives and an inquiry based ethics and social philosophy. The latter stresses growth in personal and social problem solving capabilities. A democratic society requires open processes that examine the pros and cons of societal issues, not an inflexible political ideology. In any event, critical theory remains the province of academics and has little or no presence in the real world of politics and social change. Relevant social struggle is not abetted by the unlikely dogmas of critical theory and is far more complex than the notion of oppressed masses under the thumb of a unitary ruling class.

Social life and political processes in particular need to become more reflective and deliberate, drawing on the methods of inquiry to move in the direction of more principled arrangements. However, reason and inquiry, though often paid lip service, have not fared well in an era of sound bites and spin and multiple narrow interest groups. The effort to bring reason and evidence to bear on social problems is an ongoing one. Aristotle, for example,

was concerned with what he called the practical intellect, and especially the place of deliberation in moral practice (see Loomis, 1943). More recent philosophers have emphasized education on critical thinking and problem solving. Yet, it is clear that such efforts are beset by counter forces, including new ones such as miseducative mass media. That the methods of inquiry provide better grounds for moral and social philosophy than approaches armed with fixed answers seems evident, but also frames a continuing human concern: how to gain wider support for using the best available methods and theories to confront our common social problems. This concern is one that should engage educators as well as philosophers. However, even at best, no final victories can be expected. As with school improvement, the effort must be persistent because the work is never finished.

In this section we have affirmed the relevance of scientific attitudes and methods to ethical and social problems. Views critical of science were touched on mainly to show the fundamental differences between them and inquiry based approaches. A fuller criticism of the former is beyond the scope of this essay, as is commentary on the various single concept approaches to ethics that focus, for instance, on caring, community, or respect. We also do not consider “big tent” perspectives that attempt to draw from say, critical theory, postmodernism, and conceptions of the “good school,” without integrating them philosophically.

This section closes with brief comments about stereotypes of science and scientists. As indicated earlier scientists of all kinds are very human, “all too human,” but they are hardly the robotic and inhumane figures depicted by Greenfield (1986) among others. Most wish to gain peer respect by publishing successful scholarship. However, scientists are also aware that they should be self-critical and staunchly attempt to disprove theory that they may have themselves constructed. Such self-criticism, along with the curiosity and creativity that are features of inquiry suggest a quite different set of characteristics than those of most stereotypes. In addition, the skepticism that is part of the scientific attitudes, and attention to evidence seem to be useful and desirable qualities, in assessing the claims made by others, including a variety of pundits, politicians, and advertisers. Of course, we do not have compelling evidence of any of these characteristics, even though they seem consistent with science as an activity. Our point was simply to underscore the foolishness of past stereotypes, and to suggest positive qualities a scientific temper might confer.

Concluding comments

Our critical inquest on the alleged demise of science demonstrates the value of examining such allegations carefully. In this case, the intimation that science is about to cross the Styx seems fatuous, perhaps an artifact of the wishes of those with that preference. After all, preferences often influence debates in one-sided ways. Science bashers frequently try to make their case by attacking positivism whose demise, in sharp contrast with science, would be hard to

deny. That the two just do not equate seems irrelevant to them. All this has given writing about epistemology in educational administration its never the twain shall meet quality, that is, its failure to generate substantive debate.

We have tried to look at substantive issues here, sometimes agreeing with critics, as for instance on the theory ladenness of observation and on the rejection of universal truth, while maintaining that science inquiry does not depend on, in these cases, either atheoretical observation or the attainment of final truth. Finally, it is worth noting that the perspective taken on science as human and fallible, but offering the best methods available for problem solving, is not new. It has been part of pragmatist versions of naturalism since before the rise of Vienna Circle. That perspective is a reasonable one that can serve as a touchstone from which to explore inquiry and practice as well.

References

- Boyan, N.J. (1951), "A study of the formal and informal organization of a school faculty", doctoral dissertation, Harvard University, Cambridge.
- Burrell, G. (1996), "Normal science, paradigms, metaphors, discourses and genealogies of analysis", in Clegg, S.R., Hardy, C. and Nord, W.R. (Eds), *Handbook of Organizational Studies*, Sage, London, pp. 642-58.
- Burrell, G. and Morgan, G. (1979), *Sociological Paradigms and Organizational Analysis*, Heinemann, London.
- Carnap, R. (1949), "Logical foundations of the unity of science", in Fiegl, H. and Sellars, W. (Eds), *Readings in Philosophical Analysis*, Appleton-Century-Crofts, New York, NY, pp. 408-23.
- Chapman, J.D., Sackney, L.E. and Aspin, D.N. (1999), "Internationalization in educational administration: policy and practice, theory and research", in Murphy, J. and Louis, K.S. (Eds), *Handbook of Research on Educational Administration*, 2nd ed., Jossey Bass, San Francisco, CA, pp. 73-97.
- Clegg, R.S. and Hardy, C. (1996), "Introduction: organizations, organization and organizing", in Clegg, S.R., Hardy, C. and Nord, W.R. (Eds), *Handbook of Organizational Studies*, Sage, London, pp. 1-28.
- Davies, S. (1995), "Leaps of faith: shifting currents in critical sociology of education", *American Journal of Sociology*, Vol. 100 No. 6, pp. 1448-78.
- Derrida, J. (1973), *Speech and Phenomena*, (trans. Allison, D.), Northwestern University Press, Evanston, IL.
- Derrida, J. (1976), *On Grammatology* (trans. Spivak, G.C.), Johns Hopkins University Press, Baltimore, MD.
- Derrida, J. (1994), *Specters of Marx: The State of the Debt, the Work of Mourning, and the New International*, Routledge, New York, NY.
- Dewey, J. (1922), *Human Nature and Conduct*, Henry Holt, New York, NY.
- Dewey, J. (1938), *Logic: The Theory of Inquiry*, Henry Holt, New York, NY.
- Dewey, J. and Tufts, J.H. (1932), *Ethics*, Henry Holt, New York, NY.
- Donmoyer, R. (1999), "The continuing quest for a knowledge base: 1976-1998", in Murphy, J. and Louis, K.S. (Eds), *Handbook of Research on Educational Administration*, 2nd ed., Jossey Bass, San Francisco, CA, pp. 25-43.
- Evers, C.W. (1998), "Decision making, models of mind, and the new cognitive science", *Journal of School Leadership*, Vol. 8 No. 2, pp. 94-108.
- Evers, C.W. and Lakomski, G. (1991), *Knowing Educational Administration*, Pergamon, Oxford.

-
- Farber, M. (1943), *The Foundation of Phenomenology: Edmund Husserl and the Quest for a Rigorous Science of Philosophy*, Harvard University Press, Cambridge, MA.
- Foucault, M. (1980), *Power and Knowledge: Selected Interviews and Other Writings*, Gordan, C., Marshall, L., Mephan, J. and Soper, K. (trans.), Pantheon Books, New York, NY.
- Giroux, H.A. and McLaren, P. (1987), "Teacher education as a counterpublic sphere: radical pedagogy as a form of cultural politics", *Philosophy and Social Criticism*, Vol. 1 No. 1, pp. 51-69.
- Greenfield, T.B. (1986), "The decline and fall of science in educational administration", *Interchange*, Vol. 17 No. 2, pp. 57-80.
- Griffiths, D.E., Hart, A.W. and Blair, B.G. (1991), "Still another approach to administration: chaos theory", *Educational Administration Quarterly*, Vol. 27 No. 3, pp. 430-51.
- Hodgkinson, C. (1994), *Educational Leadership: The Moral Art*, SUNY Press, Albany, NY.
- Kuhn, T.S. (1970), *The Structure of Scientific Revolutions*, University of Chicago Press, Chicago, IL.
- Larrabee, H.A. (1945), *Reliable Knowledge*, Houghton Mifflin, Boston, MA.
- Loomis, R.L. (Ed.) (1943), *Aristotle on Man and the Universe*, Walter J. Black, Roslyn, NY.
- Merton, R.K. (1973), *The Sociology of Science: Theory and Empirical Investigations*, University of Chicago Press, Chicago, IL.
- Mitroff, I.I. (1974), *The Subjective Side of Science*, Elsevier Scientific Publishing Co., Amsterdam.
- Phillips, D.C. (1992), *The Social Scientist's Bestiary*, Pergamon, Oxford, UK.
- Phillips, D.C. (1995), "The good, the bad, and the ugly: the many faces of constructivism", *Educational Researcher*, Vol. 24 No. 7, pp. 5-12.
- Smelser, N.J. (1988), "Introduction", in Smelser, N.J. (Ed.), *Handbook of Sociology*, Sage, Newbury Park, CA, pp. 9-19.
- Willower, D.J. (1964), "The professorship in educational administration: a rationale", in Willower, D.J. and Culbertson, J. (Eds), *The Professorship in Educational Administration*, University Council for Educational Administration and The Pennsylvania State University, Columbus, OH and University Park, PA, pp. 87-105.
- Willower, D.J. (1994a), "Dewey's theory of inquiry and reflective administration", *Journal of Educational Administration*, Vol. 32 No. 1, pp. 5-22.
- Willower, D.J. (1994b), *Educational Administration: Inquiry, Values, Practice*, Technomic, Lancaster, PA.
- Willower, D.J. (1996), "Inquiry in educational administration and the spirit of the times", *Educational Administration Quarterly*, Vol. 32 No. 3, pp. 344-65.
- Willower, D.J. (1998), "Fighting the fog: a criticism of postmodernism", *Journal of School Leadership*, Vol. 8 No. 5, pp. 448-63.
- Willower, D.J. (1999), "Values and valuation: a naturalistic inquiry", in Begley, P.T. (Ed.), *Values and Educational Leadership*, SUNY Press, Albany, NY, pp. 121-38.
- Willower, D.J. and Licata, J.W. (1997), *Values and Valuation in the Practice of Educational Administration*, Corwin, Thousand Oaks, CA.
- Willower, D.J. and Forsyth, P.B. (1999), "A brief history of scholarship on educational administration", in Murphy, J. and Louis, K.S. (Eds), *Handbook of Research on Educational Administration*, 2nd ed., Jossey-Bass, San Francisco, CA, pp. 1-23.
- Zuckerman, H. (1988), "The sociology of science", in Smelser, N.J. (Ed.), *Handbook of Sociology*, Sage Publications, Newbury Park, CA, pp. 511-74.