

Social Epistemology and the Recovery of the Normative in the Post-Epistemic Era

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What marks ours as the “post-epistemic era” is that it refuses to confer any special privilege on knowledge production as a social practice: whatever normative strictures apply to social practices in general, they apply specifically to epistemic practices as well. I trace how we have reached this state by distinguishing two conceptions of normativity in the history of epistemology: a top-down approach epitomized by Kant and Bentham, and a bottom-up approach associated with the Scottish Enlightenment. The advantage of the latter is that it clearly distinguishes the emergence of norms from the conditions of their maintenance. I then show how more recent evolutionary epistemology has, in a pejorative way, “naturalized” socially constructed norms of cognitive competence, whereas the logical positivists — long the bane of “progressive” epistemologists — recognized the fully artificial character of epistemic norms and hence qualify as the first social epistemologists.

From this paper’s forbidding title, you may think that I plan to delve into matters of interest only to professional philosophers. Nothing could be further from my intent. The need to “recover the normative in the post-epistemic era” is already a live issue in the public forum, and in many respects, the theories of knowledge proposed by philosophers and social scientists have yet to catch up with recent turns in public opinion. Whenever politicians query the *cui bono* of Big Science, they are posing the ultimate normative question of knowledge production. It is a question that Plato and Aristotle would have had no trouble recognizing, yet it seems strangely absent from

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the thoughts of epistemologists who enjoin us to pursue “truths” without telling us which ones, by whom, for whom, and for how long. My colleagues in the new sociology of science (e.g., Latour, 1987) have debunked this epistemological sensibility by showing that it does not correspond to anything that scientists ever worry about. Unfortunately, they have also given the impression that public concerns about the direction of knowledge production are equally misplaced. In fact, there is a recent — and, to my mind, perverse — tendency to say that we live in a “knowledge society” (e.g., Stehr, 1994), even though the most pressing normative questions concerning science make science seem less like “pure inquiry” (whatever that might be) and more like other social institutions that absorb similar levels of human and material resources. For this reason, I call my research program *social epistemology* rather than *epistemic sociology* (Fuller, 1988, 1993a, 1993b).

Consider the following arguments that are increasingly heard these days from various quarters. I do not claim that they are mutually compatible, only that they point to an emerging change in perspective:

- (1) If scientific knowledge is indeed a “public good,” then we need to scrutinize the rate of return on public investment in that “good.”
- (2) If prospective funders of scientific research are likely to bask in the glow of science’s high-mindedness, as indeed the state and major charities have in the past, then the privatization of funding for science should not jeopardize the future of truly worthwhile research, for there will always be a non-remunerative incentive to fund it.
- (3) In the case of new drugs, techniques and technologies, both the experimental capacity of science and the public’s right to choose would be best served by allowing government regulators and scientific associations to record the consequences of these innovations in use, but not allowing them to restrict the amount of risk that individuals assume for themselves.
- (4) The best way to generate knowledge for a specific purpose or setting is to have the knowledge producers collaborate with prospective consumers, even if this means that the researchers must leave their university workplaces for local communities and industrial sites.
- (5) There is no reason why the devolution of labor in our “post-industrial society” from tenured, salaried employment to more temporary piecework should not equally apply to intellectual pursuits. In fact, historically speaking, it is by no means clear that those who pursue continuous academic careers turn out to be the most significant knowledge producers.
- (6) The increase in disciplinary specialization over the course of this century has had more to do with the ability of universities and

other academic institutions to insulate themselves from political and economic pressures than to an internal trajectory of “growth through functional differentiation” of the knowledge base. If anything, academic guild barriers prove to be more hindrance than help in addressing persistent social problems that require the coordination of different expertises.

Arguments (1)–(6) share a salient characteristic that marks them as *post-epistemic* in attitude (on the post-epistemic attitude, see Fuller, 1993b, 1994a, 1994b). They refuse to confer any special privilege on knowledge production as a social practice: whatever normative strictures apply to social practices in general, they apply specifically to epistemic practices as well. Thus, instead of a traditional epistemic norm such as “maximize the number of true beliefs while minimizing the number of false ones,” (1)–(6) contain implicit appeals to normative standards that are more familiar from other spheres of social life. These norms can be enumerated as a series of imperatives to maximize the following, respectively: (1) benefit–cost ratio, (2) marketability, (3) choice, (4) relevance, (5) productivity, and (6) adaptability.

The Prehistory of the Post-Epistemic Era

The person who is meant to be shocked by the above observations is the “classical epistemologist,” who, for purposes of this paper, is simply anyone who believes that “knowing” is a distinct human enterprise governed by norms that are not reducible to the norms governing other aspects of social life. This person is likely to respond by arguing that the norms implicated in arguments (1)–(6) must presuppose such classical epistemic norms as “maximize the number of true beliefs while minimizing the number of false ones.” For example, in the case of (1), it would not make sense to be interested in the rate of return on public science funding, unless we were also interested in learning the true rate of return, or at least in coming as close to that figure as possible (the exemplar of this way of thinking is the epistemology of “social veritism” proposed in Goldman, 1992). Notice that in proposing this argument, the classical epistemologist is not only defending the distinctness of epistemic norms from other social norms, but also their logical primacy to other such norms. In other words, all social practices are presumed to be “always already” epistemic ones. Of course, the classical epistemologist draws this conclusion on conceptual, not empirical, grounds: normativity implies, at the very least, a weak form of instrumental rationality — that people act in accordance with a rule (or display a regular pattern of behavior) because it contributes to some goal or value. This, in turn, implies that people can know that the rule does indeed promote the desired end-state, for if such

knowledge were not available, then the regular pattern of behavior would be little more than a habit or ritual that the people perform simply as an historically conditioned response to their environment. Thus, in the classical epistemologist's mind, both the autonomy and the primacy of epistemic norms are needed to make a clear distinction between (rationally) norm-governed action and (irrationally) ritualized behavior.

However, this is only one historically specific way to think about norms, albeit one that has resonated throughout the last two hundred years of Western philosophy. A brief foray into the prehistory of contemporary philosophical discourse about norms is in order. The classical epistemologist's sense of normativity is very much a product of the revolution in moral philosophy that took place from roughly 1780 to 1830, whence came the two main paradigms of modern ethics, *deontology* (via Kant) and *utilitarianism* (via Bentham). This period was marked by the consolidation of the European nation-states as trading and military powers requiring much more top-down political control than even the most ambitious monarchs had desired in the past. For intellectuals of the time, a principal target of this consolidation was the legal system, since, in most countries, law enforcement had been left to judicial discretion, leading to what was perceived as "inconsistent" applications of the will of the monarch or legislature (for a comprehensive history of these developments, see Kelley, 1990, especially pp. 209–228). The remedy proposed by the likes of Kant and Bentham was a strongly legislative conception of normativity, one that would model the judicial application of the law on submission to divine will. The role of the judge then would be to discern the intentions of the lawgiver and to embody those intentions as s/he adjudicated cases. This conception opened the door to many debates over how laws should be formulated so as to be enforceable as intended. The import of these debates was to suggest that there is a fact-of-the-matter as to how the laws are to be applied in compliance with the lawgiver's original wishes. In this way, norms were constituted as objects of knowledge, on the basis of which they could govern action. However, norms were not envisaged as objects of "knowledge" in some loose sense of that term, but specifically as objects of *scientific* knowledge. To Enlightenment thinkers influenced by Newton's secularization of the deity, "divine will" was little more than a personification of the universal laws of nature. The only remaining question was whether civil laws were somehow deducible from the laws of nature or merely analogically derivable from them. But in either case, the legitimacy of coercion being applied to wayward citizens rested on the judge's capacity to correctly infer what the legislator would dictate, were s/he the one passing judgment.

An alternative conception of norms — one better suited to a post-epistemic sensibility — was first systematically articulated during the Scottish

Enlightenment of David Hume, Adam Smith, and Adam Ferguson, in the generation prior to 1780, and has subsequently been developed in both microeconomics and microsociology (including the new sociology of science). Closely, though not exclusively, associated with “invisible hand” theories of social order, it proposes that normativity is built from the bottom up and that knowledge is not a prerequisite, but a product, of spontaneously coordinated social action (Hamowy, 1987). A key insight of this perspective is that explaining the emergence of social order is different from explaining its maintenance. The standard philosophical account of norms, as described above, has a certain plausibility if one is primarily interested in the maintenance (and extension) of an order that already enjoys a measure of legitimacy. But how could such an order have arisen in the first place? According to the second view of norms, people seek disparate aims with limited means at their disposal. However, the level of scarcity is not quite as bad as in Hobbes’s state-of-nature, in which they must resort to a “war of all against all.” Rather, most people can get most of what they want if they reorient themselves in ways that enable all of them to pursue their goals at the same time. A norm therefore emerges as a common means for achieving different ends. For any given individual pursuing a specific goal, adhering to the norm will probably not be the quickest means of reaching the goal; however, it will increase the likelihood that the goal is reached at all, given the ambient population. The modern paradigm case of norms in this sense is turn-taking at a busy intersection: while all the drivers would like to cross the intersection at the same time, they are even more interested in making it to their destinations alive, which makes each yield to the other’s right of way. Once enough people’s adherence to this norm becomes integral to a society’s way of life, steps may be taken to formalize it by imposing sanctions on those who fail to adhere to the norm. The construction of traffic lights at the intersection symbolizes this move, which serves to give the norm of turn-taking the “legislative” character that brings it closer to the first type of norm.

From the standpoint of social epistemology, the crucial question to ask is when does having a special sort of knowledge become necessary for acting in a normatively appropriate fashion. While the classical epistemologist would answer, “Always,” the social epistemologist should conclude that even the epistemic character of norms requires social construction. Specifically, we must look for the emergence of a standard of correct performance that is regarded as independent of the performers under scrutiny, or what an artificial intelligence specialist might call an *objectivity simulator*. In other words, we need a technology that can manufacture facts-of-the-matter against which performance can then be evaluated. This technology need not be exalted. The set of traffic lights at an intersection would count as such a technology, relative to the range of performances that it is designed to evalu-

ate. "Knowledge" then simply becomes the ability to calibrate one's performance to said technology (this theme is pursued intermittently in Fuller, 1993a, especially pp. 23–28, 127–142, 211–213).

Let us consider in more detail the case of traffic lights at an intersection. They determine whether people have adhered to the norm of turn-taking, regardless of whether they make it across the street safely. Taking our cue from Rousseau and the early Marx, we might say that deference to the traffic lights involves "alienating" oneself from turn-taking skills acquired over a lifetime of crossing intersections. And so, once the traffic lights are erected, if someone makes it across the street safely while the light is red, we say that the person was "lucky," suggesting that he or she acted in ignorance (or defiance) of the only things that can guarantee safe passage, namely, a green light. Moreover, this is what would be meant, even if the person had made it across safely many times before. But, were the traffic lights not present, we would probably have given the same person full credit for his or her act. Similarly, if two people arrive at the same discovery, but one person follows a recognized scientific method and the other does not, we credit the professional competence of the first person and discount the achievement of the second. Only if the discovery cannot be reduced to any known method, yet it issues in major scientific consequences, do we credit both discoverers with "genius." Of course, from the logician's perch, the *post hoc ergo propter hoc* fallacy is committed when one supposes that because one follows a norm and reaches a desirable outcome, the norm is therefore responsible for the outcome being reached. (Compare crediting a raindance for rain, when rain happens to fall after the dance is performed correctly.) Nevertheless, this fallacy — the basis of most forms of superstition — is routinely committed because showing a connection between normatively appropriate performances and desirable outcomes is the primary means of demonstrating that the norms indeed embody a special form of knowledge whose efficacy goes beyond the sheer regulation of behavior.

Why Naturalized Epistemology Isn't Quite Post-Epistemic

At this point, I can imagine somebody thinking that the preceding archaeology of normativity deploys impressive firepower at a low-flying duck, since the classical epistemologist can be immobilized by simpler means. For example, we could ask whether having a logically airtight definition of knowledge palpably improves one's ability to acquire knowledge. (If not, then what is the exact benefit of studying epistemology? A deafening silence ensues. [An elaboration of this strategy is provided in Fuller, 1992a.]) However, a post-epistemic sensibility is meant to challenge not only the classical epistemologist but also most of her naturalistic opponents.

These are the people who are inclined to reduce normatively appropriate behavior to any strategy that prolongs the survival of an organism (or, if we were strict Darwinists, its descendants) in a given environment. Here too knowledge is “always already” present in the norms, not because such knowledge is conceptually presupposed, but because it is physically inscribed on the organism. Thus, my knowledge of dealing with busy intersections would be inferred by seeing, not whether I regularly obey the traffic lights, but whether my body bears the signs of having made it across the street in one piece. This is a view common to pragmatists like James and Dewey, physicalist analytic philosophers like Quine and the Churchlands, as well as evolutionary epistemologists like Donald Campbell and David Hull. They all stress a continuity between animal instinct, common sense, and the scientific method as degrees of “cognitive engagement” with, or “environmental adaptation” to, the natural world. Thus, these thinkers tend to believe that the oxymoron “folk science” refers to something that scientifically untrained people already possess and, even in their most rigorous moments, they happily interchange words like “perception” and “cognition,” “concept formation” and “theorizing,” and (with the partial exception of the pragmatists) “brain” and “mind.”

This fusion of terms is often grounded in the Darwinian notion that precedents for most of the defining properties of *homo sapiens* can be found, at least in nascent form, throughout the animal kingdom. For example, “cognition” turns out to be perception that has been evolutionarily enhanced by memory and foresight. But naturalistic epistemologists also make it quite clear that “scientific knowledge” is probably the best mode of adaptation that our species — perhaps any species — has evolved. Together these two views end up licensing the conclusion that the pursuit of science is a natural extension of people’s innate “curiosity,” or some such animal tendency, and that palpably anti-scientific trends such as religious fundamentalism or political authoritarianism prevent us from realizing our full potential.

This all sounds rather liberal, and was generally seen that way when first presented about a hundred years ago. However, among the long-term institutional consequences of this position has been the introduction of science-inspired criteria (typically inspired by physics) to evaluate the full range of human adaptive skills that naturalists generically lump together under the rubric of “knowledge” or “intelligence.” While Piaget’s model of child development remains the most blatant example of this vision’s hold on 20th-century psychology, even as benign a force as John Dewey made this sort of scientism palatable for several generations of American educators, when his paradigm case of “thinking” turned out to be hypothesizing about the movement of soap bubbles in a recently washed glass tumbler (see Dewey, 1910,

chapter 6).¹ Admittedly, neither Piaget nor Dewey had much training in physics, but several of the early proponents of intelligence testing, and cognitive psychology more generally, did. For them it was quite natural to envisage the notebooks of a great physicist like Franklin or Faraday as containing self-elicited protocols of their thought processes, making them exceptionally good witnesses to events that everyone else experiences unconsciously.² And seeing how easily the past is forgotten, one could predict that within fifty years someone would turn this development on its head by looking to concept acquisition in children as a model of how novices acquire the basic principles and techniques of a science. The predicted person turned out to be the ex-physicist Thomas S. Kuhn (1977).³

It may seem liberal to say, as the naturalist does, that nobody is held back from attaining the epistemic respectability of a scientist. Yet, such hopeful expressions were routinely translated into strategies for turning everyone into a scientist — at least before they were turned into anything else. Thus, for most of this century, the “formal reasoning” ability of students has been gauged by their success at constructing and manipulating the simultaneous equations needed to solve watered-down versions of “work problems” in classical mechanics.⁴ Failure to perform adequately on such tests seriously hampered people’s career choice and mobility, regardless of how tangential the skills measured by those tests were to their actual employment prospects. While there has always been a minority report against this tendency in educational psychology, the principled denial of a unified faculty of “knowing” — nowadays dubbed the “multiple intelligences” thesis — began to com-

¹This example, in turn, served as the paradigm-case of the deductive-nomological model of scientific explanation in the positivist classic, Hempel (1965, pp. 335–338).

²I am alluding here to the sources for the early models of cognitive processing proposed by Otto Seltz and Karl Duncker in the 1920s. A good detailed history of the first fifty years of experimental cognitive psychology — that is, until just before the computer revolution — is Humphrey (1951). Also telling are Köhler’s reminiscences about the influence that his old physics professor, Max Planck, had on his conception of intelligence. See Köhler (1971), especially pp. 112–113, 187–188.

³In a somewhat speculative and reflexive vein, it is worth remarking that most studies, from Binet onward, have shown memory not to be an important component of intelligence (Sternberg, 1990, p. 78). This point may be reproduced at the macro-level in the tendency of “harder” sciences (starting with physics) to have shorter historical memories. See Fuller (1994c) for an elaboration.

⁴This way of testing formal reasoning ability can be traced back at least to the French founder of intelligence testing, Alfred Binet, and through his American followers Terman and Wechsler. As Sternberg (1990, p. 81) observes, there has been a tendency to apply the test to younger children. Originally, work problems were given to 14-year-olds, nowadays to 6-year-olds.

mand its current levels of research funding and media attention only once big business started to wonder aloud whether the standards of knowing and reasoning enforced by educators for most of this century were capable of adapting to capitalism's quickly changing competitive environment.⁵

Here the profiteers may have gotten a leg up on historians who continue to mean by the "democratization" of educational institutions the sheer fact that increasing numbers of people undergo the same sets of standardized examinations before being awarded degrees and jobs. To be sure, these reforms have been "democratic" in the sense of subordinating everyone to a common standard of achievement. But at the same time, they have effectively removed alternative paths of advancement, especially such experience-based ones as working one's way up from the stockroom (Ringer, 1979, especially pp. 27–29). It is therefore time to pose the awkward question: Why *must* students prove themselves as decent little physicists before they are permitted to pursue the line of work they really want or society really needs?

There may be no good positive answers to this question that do not also presume the continued desirability of a univocal conception of "knowing" that can be used as common currency for dispensing credentials. This conception became an institutional strategy in the imperial period immediately following the Franco–Prussian War of 1870 (Fuller, 1994c, especially pp. 602 ff). Germany was thought to have won because the aptitudes of its citizens were optimally classified and deployed in the array of tasks needed for the nation to consolidate into a fighting unit. The intelligent nation was thus one that correctly organized the intelligence of its citizenry. However, as the scene of global struggle has shifted from head-on confrontations over land to more dispersed competition over consumers, it is no longer clear that much advantage is to be gained by a state-maintained, unified system of cognitive evaluation, especially one that claims to grade people for qualities that they possess *intrinsically*. (Indeed, intelligence testing might have been deemed futile, had it not been thought that people have a determinate amount of the relevant cognitive abilities at any given point in their lives, and that after a certain point of "maturity," the amount remains fixed.) At the level of theory, and despite their surface differences, classical and naturalistic epistemologists agree to insert "knowledgeability" as what might be charitably called an "intervening variable" (or less charitably, an "obligatory passage point") that renders, in the one case, regular behavior rational and, in the other, adaptive behavior intelligent. But I have been arguing that this insertion is not merely conceptual or empirical but, more importantly, *institutional*.

⁵Among the psychological researchers who have benefitted from major corporate sponsorship of studies on "multiple intelligences" are Howard Gardner (Harvard), Robert Sternberg (Yale), and Mihaly Csikszentmihalyi (Chicago).

Consider the following analogy. Just as theologians have underwritten the existence of a "soul" to whose needs priests are equipped to minister, epistemologists have similarly underwritten the existence of specifically "cognitive" powers, the training of which requires state-certified educators. Of course, theological conceptions of the soul have ranged very widely — from divine connection to personal conscience — but no more so than epistemological conceptions, from the classicist's sense of the knower as a pure intelligence (modeled on the angels) to the naturalist's sense as a clever animal (modeled on the apes). In all these cases, a certain measure of self-alienation is required: people are called upon to admit that others are in a better position than themselves to evaluate aspects of their activities that are assigned pride of place in most definitions of humanity. This concession to external evaluation turns out to place people at the constant mercy of an elite subset of their fellows, the professional clergy and educators. In one respect, the situation is rather ironic. On the one hand, much of the rhetoric of "cognitivism" is designed to distance knowledgeable from sociability; yet, on the other, it is only once some aspect of human psychology is infused with a "cognitive dimension" — as in the alleged "theory-ladenness of observation" — that a clear license is given for others to come between you and your soul by introducing training programs and performance standards.

Lest you think otherwise, it would be a mistake to diagnose my complaint as that of a libertarian who resists having his way of dealing with the world held to a standard not of his own creation. Rather, I more specifically object to the lack of symmetry in the enforcement of the norms associated with cognition. In other words, I would be happier with the epistemological enterprise if "the laws of thought" were treated more like civil laws, whereby police officers, judges, and lawyers are just as accountable as ordinary citizens to the laws. Numerous examples of a more symmetrical orientation to epistemic standards can be found in the psychological literature exposing the fallacies of expert judgment (e.g., Arkes and Hammond, 1986).⁶ Unfortunately, standards of reasoning or knowing seem to invite a double standard. What count as infractions and signs of a debased cognitive status when committed by a non-adept in the sciences of knowing may be excused and even regarded as marks of creativity and genius when committed by a keeper of the standard, someone professionally qualified to "know better." Often a mysterious expression like "tacit knowledge" is invoked to license the qualified knower's discretionary actions, and nowadays it is popular to say that truly intelligent

⁶My own thinking along these lines was originally stimulated by reading Faust's (1985) reflexive critique of psychologists as experts.

behavior cannot be reduced to rule-following.⁷ Nevertheless, it is striking just how readily those rules are invoked whenever a novice or stranger needs to be set straight.

Back to the Future in Spite of Themselves: The Logical Positivists as Applied Social Epistemologists

As it turns out, I am not the first to raise these concerns. At least one school of 20th-century philosophy has been self-conscious of the artificial character of a distinctly “scientific” or “cognitive” standard of human performance. Though rarely appreciated for this aspect of their thought, the logical positivists were always clear that specifically knowledge-oriented enterprises have been rare and difficult to sustain, mainly because the strongly emotive and rhetorical character of ordinary language renders it an unwieldy vehicle for engaging in such pursuits. How, then, did society acquire the discipline needed to submit at least a portion of its activities to knowledge-based standards? An answer was provided early in the career of the movement by the founder of the Vienna Circle, Moritz Schlick, who was keen on situating the positivists’ efforts against the general backdrop of evolutionary theory. However, Schlick found the pragmatists’ attempts to naturalize cognition much too facile, as it was not true to the historical difficulties that natural scientific inquiry had in becoming a legitimate part of European civilization. The ultimate source of Schlick’s explanation was the Scottish Enlightenment view of normativity described above. However, in the 150 years that separated Schlick from such illustrious Scots as Hume, Smith, and Ferguson came Kant, Hegel, and most immediately, Wilhelm Wundt, whose social psychological account of how means become “ends-in-themselves” was Schlick’s model for explaining the emergence of an autonomous epistemic standard (Schlick, 1925/1974, pp. 94–101).⁸

The basic idea here is that once people realize that they cannot get everything they want when they want it, they will offset their tradeoffs by investing special significance in the means to which they are collectively forced to

⁷Here I mean “rule-following” in a fairly broad sense to include all publicly definable patterns of behavior, such as Skinnerian contingencies of reinforcement (which may be opaque to the organism but transparent to the behaviorist). There is a remarkable convergence among phenomenological philosophers and sociologists of knowledge on the irreducibility of cognition to rules, especially when flanked by the adjective “mechanical.” Compare Dreyfus and Dreyfus (1986); Collins (1991).

⁸Schlick (on p. 97) claims that his views go back to a 1908 book that was influenced by Wundt’s *Prinzip der Heterogenie der Zwecke*. For additional historical backdrop to Schlick’s views, see Fuller (1994c), especially p. 616.

resort. Much as cognitive dissonance theory might predict, people translate the obstacle into a form of discipline that is valued for its own sake, and may ultimately replace the original goal as the one worth pursuing. It is a case of what the political theorist Jon Elster (1984) has dubbed “sweet lemons,” whereby a forced situation is reinterpreted as the best that one could have chosen. As the expression “sweet lemons” suggests, this psychic conversion requires a reinterpretation of one’s basic sensory responses to the means-turned-ends. After all, however we wish to characterize the “pleasure” one receives from following the law, thinking logically, or mastering a body of knowledge, it is clearly not like the pleasures that have traditionally animated hedonistic philosophies.

This point was not lost on those who opposed the growing professional autonomy and civil authority that were accorded to the natural sciences. In fact, the previous occupant of Schlick’s chair in the history of the inductive sciences, Ernst Mach, devoted much of his career to arguing that advanced research in the physical sciences exhibited diminishing returns on investment because it required intensified effort on increasingly specialized problems, the solutions to which were unlikely to reduce the collective burdens of humanity — the only legitimate goal of science, as far as Mach was concerned. Mach’s sensibility, though clearly a minority report during the breakthroughs in atomic theory at the start of the century, had come to permeate Weimar thinking about science after the physics and chemistry communities were saddled with Germany’s humiliating defeat in World War I (Forman, 1971). In response, Schlick appealed to the distinctly “civilized pleasures” associated with pure science that were not reducible to the pleasures — or pains, in the case of the First World War — made possible by science’s technological extensions. This became the basis of the logical positivists’ strongly theory-driven conception of scientific inquiry, the autonomous character of which appeared to be modeled more on the history of mathematics than of any of the natural sciences.

The value of recovering the above history is that it sheds a more nuanced light on the conversion of means to ends epitomized by the modern fixation on knowledge. When first discussing the Scottish Enlightenment, I mentioned traffic lights as a contemporary example of this normative conversion. In that case, a spontaneously generated convention eventually was converted into a formal law. However, historically the most worked over example in this tradition has been *money*. Karl Marx (1964) and Georg Simmel (1978) did very sophisticated analyses of the social psychological consequences of money as a universal medium of exchange in the capitalist economy. Both Marx and Simmel hit upon how the physical characteristics of money — especially its durability across many exchanges — enabled people to engage in long-term calculations. This, in turn, had a subtle long-term effect of

causing people to reverse the status of money in their minds so that, from a mere medium of exchange on par with other tokens one might use, it became “the universal commodity,” more of which everyone always sought whenever they exchange goods. Marx and Simmel portray these developments as largely unplanned and even unconscious. No one ever explicitly decided to homogenize the values of goods for the sake of standardizing trade, but by the time the world’s major currencies adopted the gold standard in the mid-19th century it was natural to suppose that such a psychic tradeoff had already been made and the standard itself was simply its ratification (the implications of the Marx–Simmel analysis of money for knowledge as intellectual property are explored in Fuller, 1991, 1992b).

In striking contrast to both the traffic and money examples, Schlick engaged in rather *deliberate* efforts to seclude science from instrumental value, to redraw the ancient Greek distinction between theory and practice, research and application, science and technology — all of which had become blurred with the mutual reliance of scientific research and industry-based technologies.⁹ This bespoke an interesting twist on the Scottish Enlightenment vision of normativity. A natural, if somewhat anachronistic, way of understanding the idea of “spontaneously generated order” is as a stable pattern of low probability events — the sort of thing for which the mathematics of chaos theory is meant to describe. Schlick and his fellow positivists fully recognized the unnaturalness and instability of such orders: the fact that knowledge-oriented institutions had persisted for, say, 250 years (the period from the founding of the Royal Society to the Vienna Circle) was no guarantee that they would continue in perpetuity. They may just as easily disappear as they appeared — if the artificial conditions that sustain them are not maintained. This is the context in which the major logical positivist projects, such as a unified language of science, should be seen, namely, as part of a very active and ongoing social construction of the autonomy of science.¹⁰

⁹It is interesting to speculate that, because (unlike the logical positivists) he was on the winning side of the Great War, a pro-science philosopher like John Dewey saw little harm in such blurring, and was even inclined to regard technology as a manifestation of science’s “social intelligence.”

¹⁰Needless to say, little of the social constructivist tendencies of logical positivism have made it into the philosophical histories of the movement. However, without this perspective, it becomes all too easy to dismiss, in Rorty-like fashion, the positivist worries as chimeras that should never have troubled anyone in the first place. In the preface to the seminal Vienna Circle work, the *Aufbau*, Rudolf Carnap (1928/1969, pp. xvii–xviii) openly acknowledges the historic struggle in which he and his circle are engaged. Speaking through Carnap’s ghost, I try to get a distinguished latter-day neo-positivist, Philip Kitcher, to face the movement’s past in Fuller (1994d).

As a social epistemologist, it is not enough for me at this point to conclude that science “really” is not continuous with animal instinct or that there “really” is no distinct cognitive faculty. For if reality “really” is a social construction, then a century of institutionalization — in both the disciplines of philosophy and psychology and our training and testing practices — has made these conceptions literally come true. The powers of institutionalization were clearly grasped by the original logical positivists, though subsequently lost by both classical and naturalistic epistemologists. The only “real” question to ask, then, is whether the institutionalization of some other conception would improve the human condition, once we have factored the cost of dismantling the current regime. Unfortunately, even this question is less straightforward than it seems, as the knowledge system erected since the end of the Franco–Prussian War is already under deconstruction, though, as usual, our epistemological discourse has yet to reflect that palpable shift. Consequently, such catchphrases of the moment as “ownership of knowledge” and “intellectual property” remain, from most philosophical standpoints, contradictions in terms. But this is a stand taken more out of ignorance than defiance of the emerging trends. In the post-epistemic world of tomorrow, “science” may slide into the semantic space of “religion” and refer more to set of institutions and rituals than a set of theories and methods. And as educational standards fragment, “knowing” may come to signify specific social practices like “verifying” or “certifying,” or it may devolve into a casual word like “coping” and “adapting.” While neither case invites the ontological space needed for justifying a philosophical discipline of “epistemology,” that would be a small price to pay to vindicate the essentially social character of knowledge.

References

- Arkes, H.R., and Hammond, K.R. (Eds.). (1986). *Judgment and decision-making: An interdisciplinary reader*. Cambridge, England: Cambridge University Press.
- Carnap, R. (1969). *The logical structure of the world and pseudoproblems in philosophy*. Berkeley: University of California Press. (Original work published 1928)
- Collins, H. (1991). *Artificial experts*. Cambridge, Massachusetts: MIT Press.
- Dewey, J. (1910). *How we think*. Boston: D.C. Heath.
- Dreyfus, H.L., and Dreyfus, S.E. (1986). *Mind over machine: The power of human intuition and expertise in the era of the computer*. New York: Free Press.
- Elster, J. (1984). *Sour grapes*. Cambridge, England: Cambridge University Press.
- Faust, D. (1985). *The limits of scientific reasoning*. Minneapolis: University of Minnesota Press.
- Forman, P. (1971). Weimar culture, causality, and quantum theory, 1918–1927. *Historical Studies in the Physical Sciences*, 3, 1–115.
- Fuller, S. (1988). *Social epistemology*. Bloomington: Indiana University Press.
- Fuller, S. (1991). Studying the proprietary grounds of knowledge. *Journal of Social Behavior and Personality*, 6, 105–128.
- Fuller, S. (1992a). Epistemology radically naturalized: Recovering the normative, the experimental, and the social. In R.N. Giere (Ed.), *Cognitive models of science* (pp. 427–459). Minneapolis: University of Minnesota Press.

- Fuller, S. (1992b). Knowledge as product and property. In N. Stehr and R. Ericsson (Eds.), *The culture and power of knowledge* (pp. 157–190). Berlin: Walter de Gruyter.
- Fuller, S. (1993a). *Philosophy of science and its discontents* (second edition). New York: Guilford, 1993.
- Fuller, S. (1993b). *Philosophy, rhetoric, and the end of knowledge: The coming of science and technology studies*. Madison: University of Wisconsin Press.
- Fuller, S. (1994a). The sphere of critical thinking in a post-epistemic world. *Informal Logic*, 16, 39–54.
- Fuller, S. (1994b). Das Universität aus sozialkonstruktivistischer Perspektive. *Deutsche Zeitschrift für Philosophie*, 42, 455–472. (Published in English as: Rethinking the university from a social constructivist standpoint. *Science Studies*, 1994, 7, 4–16)
- Fuller, S. (1994c). Toward a philosophy of science accounting: A critical rendering of instrumental rationality. *Science in Context*, 7, 591–621.
- Fuller, S. (1994d). Mortgaging the farm to save the (sacred) cow. *Studies in History and Philosophy of Science*, 25, 251–261.
- Goldman, A.I. (1992). *Liaisons: Philosophy meets the cognitive and social sciences*. Cambridge, Massachusetts: MIT Press.
- Hamowy, R. (1987). *The Scottish Enlightenment and the theory of spontaneous order*. Carbondale: Southern Illinois University Press.
- Hempel, C.G. (1965). *Aspects of scientific explanation*. New York: Free Press.
- Humphrey, G. (1951). *Thinking: An introduction to its experimental psychology*. London: Methuen.
- Kelley, D.R. (1990). *The human measure: Social thought in the Western legal tradition*. Cambridge, Massachusetts: Harvard University Press.
- Köhler, W. (1971). *Selected papers* (M. Henle, Ed.). New York: Liveright.
- Kuhn, T.S. (1977). Second thoughts on paradigms. In F. Suppe (Ed.), *The structure of scientific theories* (pp. 459–482). Urbana: University of Illinois Press.
- Latour, B. (1987). *Science in action*. Cambridge, Massachusetts: Harvard University Press.
- Marx, K. (1964). *The economic and philosophical manuscripts of 1844* (D. Struik, Ed.). New York: International Publishers.
- Ringer, F. (1979). *Education and society in modern Europe*. Bloomington: Indiana University Press.
- Schlick, M. (1974). *The general theory of knowledge*. Vienna: Springer-Verlag. (Original work published 1925)
- Simmel, G. (1978). *The philosophy of money*. London: Routledge & Kegan Paul.
- Stehr, N. (1994). *Knowledge societies*. London: Sage.
- Sternberg, R. J. (1990). *Metaphors of mind: Conceptions of the nature of intelligence*. Cambridge, England: Cambridge University Press.