

tested topic in recent decades that it must sound definitely odd to suggest that a text written fifty years ago could have fully resolved these exceedingly complex issues.

In a similar vein, Zack follows the unfortunate trend in contemporary philosophy of science, whereby Steven Jay Gould's book *The Mismeasure of Man* has been hailed as the last word in a number of debates, despite its notoriously controversial status among scholars in the relevant fields. So Zack concurs with Gould's claim that the general intelligence factor (*g*) is just a statistical artifact devoid of psychological reality, apparently without awareness that most researchers in psychometrics would regard his way of repudiating *g* as simplistic and unpersuasive. Pursuing the general intelligence factor is still widely regarded as the most promising research program in this area of inquiry, but even those psychologists who are skeptical about *g* (like Ulric Neisser) tend to dissociate themselves from Gould's critique because they regard it as "rather thin, relying chiefly on rhetoric and ignoring empirical evidence."

It is again by invoking Gould's authority that Zack rejects the hypotheses that there are racial differences in cranial capacity and brain size, and that brain size is correlated with IQ ("Gould's debunking of such anthropometry is justifiably acclaimed"), although in reality these hypotheses happen to be well confirmed empirically. For instance, Leigh Van Valen found a statistically significant correlation between brain size and IQ in an important paper from 1974, and his prediction that the correlation will prove to be even stronger with better measurements was later corroborated.

The main weakness of Zack's book is her selective reading of the literature. Typically, she dismisses the realist view on race without actually making contact with the strongest arguments advanced in favor of that view. But one cannot convincingly show that "race" is biologically meaningless by criticizing the eighteenth-century ideas about race or by citing mainly those present-day authors who side with social constructivism. One has also to examine and critically evaluate the best recent work that points to the possible biological reality of race. Zack's opinions would carry much more weight if she made some effort to engage with these radically opposing voices, rather than leaving them out of consideration virtually completely.

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Ian Hacking, *Historical Ontology*. Cambridge, MA: Harvard University Press (2002), 320 pp., \$39.95 (cloth).

While naturalized epistemology has become a mainstay of analytic philosophy of science, "naturalized ontology" is not exactly a household

phrase. True enough, Arthur Fine has advocated the “Natural Ontological Attitude” in discussions of scientific realism. But NOA, like most of the realism debate, is concerned with the transcendental question of the status of unobservable entities in science. That debate leaves many substantive questions concerning the ontology of science unaddressed. Are scientific classification schemes based on causal power or causal history (etiology) or both? Can there be crosscutting schemes of the same scientific domain? And if so, are such classification schemes the same as incommensurable schemes? Are there such things as natural kinds, and if so, what are their distinctive features? Are some kinds more natural than others? Are there special philosophical problems associated with social categories, because of the self-reflexive nature of such categories? Do social categories have a kind of subjectivity that categories in the natural sciences lack? These questions are mostly conspicuous by their absence in recent philosophy of science.

Ian Hacking may be thought of as one of the principal proponents of naturalized ontology in the philosophy of science. Moreover, his naturalism is historicist through and through, particularly when it comes to the social sciences, which tend to be his stalking ground in these essays. Hence the title of this collection, *Historical Ontology*, which Hacking admits “is not, at first sight, a happy phrase” (1). The essays in this collection were written over more than a quarter of a century (from 1973 to 1999) and cover a range of topics, from Leibniz to mistranslation and from Wittgenstein to dreaming. Though the essays range widely in subject matter, Hacking proposes two recurring themes: the uses a philosopher can make of history and the work of Michel Foucault (v). Few other philosophers of science are equally at home in the world of Bachelard and Foucault as that of Carnap and Quine, and none has done so much to advance the work of all four. In this review, I will not attempt to convey the striking breadth of scope and erudition evinced in these essays, but will try to touch on a few important ideas.

What, then, is “historical ontology”? Hacking attributes the phrase to Foucault and characterizes his own version of it as follows: “My historical ontology is concerned with objects or their effects which do not exist in any recognizable form until they are objects of scientific study” (11). To illustrate, Hacking cites a doctoral thesis by James Wong on child development, which argues that our very idea of what a child is has been formed by a scientific theory of development. Though we are not forced to conceptualize children in this way, the concept of development has become a natural and pervasive category to organize our experience of children. Moreover, this and other organizing concepts come into being through specific historical processes, whose exposition may be termed “historical ontology.” Though the example of child development does not seem to have

appeared in Hacking's previous writings, the general idea has been sounded in his work for well over a decade, particularly regarding such categories as child abuse, multiple personality, "mad travelers," and so on.

So far so Foucauldian. Hacking uses these ideas to argue that in the social sciences, the very creation of categories often changes reality in the way that it does not in the natural sciences. This is what he has called elsewhere "the looping effect of social kinds" (or "interactive kinds"): the way in which "various concepts, practices, and corresponding institutions . . . , at the same time disclose new possibilities for human choice and action . . ." (4). But Hacking emphasizes that the kinds and categories associated with his historical ontology "do present themselves as positive knowledge, the bearers of general facts and testable truths about the human condition" (24). These theses are central to his "dynamic nominalism," which holds that the creation of categories changes social reality and brings new objects into being, but that these objects are no less real for all that.

Another idea that recurs in these essays, which also touches on the central theme of the uses of history for philosophy, has to do with what Hacking calls "styles of reasoning." He offers only ostensive definitions of this term (which he borrows from the historian of science A. C. Crombie), for example: the hypothetical construction of analogical models, or the ordering of variety by comparison and taxonomy. A necessary condition for styles of reasoning in science is that they introduce new kinds of objects and laws, and possibly also explanations, classifications, and so on (189–190). Moreover, "they introduce new ways of being a candidate for truth or for falsehood" (190), so truth and falsity can only be judged within styles of reasoning, making them "self-authenticating" and "curiously immune to anything akin to refutation" (192). But Hacking distinguishes his own view from "constructionist" accounts of science, on the grounds that these accounts hold that there are no facts to be discovered until constructed, whereas he maintains that "if a sentence is a candidate for truth or falsehood, then by using the appropriate style of reasoning we may find out whether it is true or false" (191–192). But if that sentence is not assessable in the absence of that style of reasoning, doesn't that amount to saying that the fact that it describes is constructed by that style?

Hacking does not answer all the questions associated with these important insights, but he does promise two forthcoming studies, one about making up people and another about styles of reasoning (v). The essays in this book serve to indicate new ways in which history and philosophy can interact, particularly the history and philosophy of science. Must one do philosophy of science in this way? No, and indeed Hacking himself often does not. As he points out with some satisfaction, he has just completed an elementary textbook on probability and inductive logic in which "there is no trace of historical ontology" (25). This review has touched on

only a few of the essays collected in this diverse collection. Besides the essays I have cited, there is a masterful study of Descartes and Leibniz, which traces their contrasting conceptions of truth and proof, and a review of Wittgenstein's *Remarks on the Foundations of Psychology*, which could serve as a useful pedagogical introduction to his work in the philosophy of mind, among a number of others.

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Alvin I. Goldman, *Pathways to Knowledge: Public and Private*. Oxford: Oxford University Press (2002), xiv + 224 pp.

Pathways to Knowledge is a collection of recent articles, all but one recently published. Gathered together, they show the fecundity of Alvin Goldman's reliabilist epistemology, addressing topics ranging from a priori knowledge to the epistemic status of introspection to the current state of social epistemology. This review will focus on those ideas of most interest to philosophers of science.

Goldman espouses an "externalist" reliabilism that easily coheres with both naturalistic epistemology and evolutionary psychology. Consistent and careful application of reliabilism shows that naturalism is not inconsistent with a priori warrant since (some or all) intramental cognitive processes may be reliable. Thus construed, a priori knowledge is neither certain nor unrevisable. So a priori knowledge does not have privileged epistemic status, as was assumed from Descartes on. To the extent that it is reliable, we may thank the forces of evolution on cognition.

Goldman's reliabilism entails that the ultimate epistemic virtue is *truth* (or at least accuracy). This view is called *veritism*. Goldman does not simply stipulate this, but attempts to give evidence for it by considering other suggested epistemic virtues such as coherence, and showing that veritism underlies these virtues. Goldman has some particularly intriguing things to say about epistemic virtues in science, such as generality and simplicity. He does not think that they "reduce" to truth but claims that they specify the kinds of truth that scientists are interested in. In this sense, he allows that science is responsive to interests. Moreover, Goldman distinguishes science from everyday knowledge and other kinds of knowledge, claiming that the epistemic virtues of science, other than truth, do not hold sway elsewhere. And Goldman takes on some recent work in philosophy of science (notably Nancy Cartwright's), which denies that true generalities are the goals of science. Goldman maintains that although true generalizations are not always achieved, they are the goal of scientists.

