

**Review of Stuart Firestein, *Ignorance: How it Drives Science*.
New York: Oxford University Press, 2012, Pp. viii, 195.
Lorraine Code, York University**

Stuart Firestein's book makes a provocative, if somewhat oblique, contribution to recent work on ignorance, for the line of thought is less clearly drawn between ignorance on one side, and received or established knowledge on the other than it is, for example, in Shannon Sullivan's and Nancy Tuana's (2007) *Race and Epistemologies of Ignorance*, or Robert Proctor's and Londa Schiebinger's (2008) *Agnotology: The Making and Unmaking of Ignorance*. In these two books, the project is overtly political in that the essays, variously, expose and deplore the ignorance that passes for knowledge for its effects in tacitly or even overtly endorsing racism, sexism, and other social injustices, in minimizing the dangers of tobacco smoking by promoting a level of doubt about their demonstrability, sustaining xenophobia through cultivated ignorance, serving commercial interests by suppressing nascent knowledge at the expense of human and ecological health and well-being. Firestein's purpose could perhaps also be characterized as political, but in a less negative sense, for its commitment to applauding ignorance is somewhat differently construed, championing its heuristic value for stimulating scientific curiosity, exploration, problem solving. Moving away from a tacit but deeply embedded conviction in western culture that ignorance is, above all, to be deplored and conquered, dispelled, eradicated, the ignorance Firestein celebrates is akin to an invitation, exhibited in an empty or open space, but a charged space that makes room for action and energizes inquiry in the openings it exposes where innovative research can proceed, in areas contiguous with well-explored domains of scientific practice and discovery.

Although Firestein attributes to Robert Proctor the coining of *agnotology* as a term to designate the study of ignorance, two caveats are in order here. First, as Proctor himself notes, the term was coined by the linguist Iain Boal in 1992, not by Proctor himself.¹ Second, lest such a correction/reminder seem to smack of gratuitous nit-picking, it is worth noting in light of Firestein's own arguments that even though Proctor makes space for thinking about ignorance in ways more or less analogous to those that prompt Firestein's thinking, he (Proctor) makes clear from the outset that the discussions of ignorance in the *Agnotology* volume – as is apparent also from his introductory article – are about much more than the “not yet known” (which is Firestein's principal issue): more about “the conscious, unconscious, and structural *production* of ignorance, its diverse causes and conformations, whether brought about by neglect, forgetfulness, myopia, extinction, secrecy, or suppression” (p. 3, my emphasis). Proctor does touch, in this essay, on the kinds of ignorance that matter for Firestein: he notes that for modernity, “ignorance becomes a kind of *vacuum* or hollow space into which knowledge is pulled ... Ignorance here is seen as a *resource* ... needed to keep the wheels of science turning” (p. 5, emphasis in original). But my point is to note that Firestein overstates the case in drawing attention to the *Agnotology* volume as though its purposes and his were

¹ Robert Proctor, “Agnotology: A Missing Term to Describe the Cultural Production of Ignorance (and Its Study)”. In Robert N. Proctor & Londa Schiebinger, eds., *Agnotology: The Making & Unmaking of Ignorance*. Stanford: Stanford University Press, 2008, p. 27.

congruent, whereas the overlap is quite minimal. The comparison does not serve his purposes well.

Aptly, Firestein quotes Mary Poovey who, in *A History of the Modern Fact*, traces the development of “the fact” as the most solid and reliable unit of knowledge.² A fact invites and often warrants trust because, presumptively, it owes no debt to authority, opinion, or bias but has its source in allegedly unbiased observation and measurement, uncontaminated by human observation or idiosyncrasy. This thought recalls a passage from Leo Tolstoy’s *Anna Karenina*, where a commission had been appointed to investigate the lives of the racial minorities. As Tolstoy writes: “The life of the minorities was investigated in its political, administrative, economic, ethnographic, material and religious aspects. All questions were furnished with excellent answers, and answers not open to doubt, since they were not the product of human thought, which is always subject to error, but were the products of institutional activity.”³ The idea of institutional activity as bias free, and of “the fact” as preserving a stand-alone truth, provides perhaps the most hard-edged contrast with common perceptions of ignorance as at once an epistemic failure and a moral character flaw. The sense of a fact’s being somehow set apart from the fray of contestation, of having a quasi-institutional status not unlike what Tolstoy implies, catches the folk wisdom enacted, for example, in Mickey Spillane’s quest for “Just the facts, ma’am”. Facts both in science and in detective work would provide solid starting points from which less secure deductions could proceed, and to which such deductive processes could return, were they to arrive at moments of uncertainty. Ordinarily, as the Tolstoy passage confirms, the thought is that facts are exempt from the ephemerality of whimsy, human error, bias, and conjecture. Thus they hold fast. The fact, in short, is the basic unit of knowledge: it brings ignorance to a halt, and counts among the starting points for further inquiry, whether scientific or secular. Hence the hegemonic epistemological position of the Anglo-American philosophical world has emphasized the propositionally stated fact — S knows that p — as the unit of certainty, and post-positivist empiricists have in principle, if not always in practice, aligned themselves with a stylized model of “science” somehow aggregated or reified as the standard-setting discipline for producing certain knowledge, often not taking into account how scientific method is practiced within a set of framing assumptions that are just the ones Firestein examines.

From the outset, Firestein contests these seemingly simple fixed assumptions, which for him amount to “idealized”, albeit persistent, views of “the fact”. While he allows that “facts are what we work for in science”, he nonetheless contends — and this I suggest is his central thesis and message — that “no datum is safe from the next generation of scientists with the next generation of tools. The known is never safe; it is never quite sufficient” (21). And of course there is more: in ways that do connect, if indirectly, with

² Mary Poovey, *A History of the Modern Fact: Problems of Knowledge in the Sciences of Wealth and Society*. Chicago: University of Chicago Press, 1998.

³ Leo Tolstoy, *Anna Karenina* [1873-7], Trans. Richard Pevear and Larissa Volokhonsky. Allen Lane: The Penguin Press, 2006, p. 370. I cite this passage in Lorraine Code, “An Ecology of Epistemic Authority”. *Episteme: A Journal of Social Epistemology*. Special Issue “Social Cognitive Ecology and its Role in Social Epistemology”, Vol. 8, No.1, 2011, 25-37.

the political implications of ignorance examined in the texts I have mentioned, Firestein reminds his readers that regularly throughout the history of science, “apparent knowledge hid our ignorance and retarded progress” (23) — a Kuhnian point, I suggest, that attests both to the persuasiveness and the ultimately limited explanatory powers of certain “views of the universe” that have guided scientific research during the period of their paradigmatic ascendancy, and have had to give way to demonstrations of the areas of ignorance they left open. When these demonstrations overwhelmed the knowledge thus enabled, a paradigm shift would begin to take place, animated by commitments to work within those areas of ignorance exposed and newly opened to new projects of inquiry. Whether Firestein would endorse such a Kuhnian gloss on his position is unclear, but Kuhn’s receiving no mention in his text or in the index suggests he might not.

Firestein nonetheless makes a provocative case for the part ignorance plays in “driving science”. It would be still more provocatively innovative had he resisted riding on the coat tails of the Proctor and Schiebinger project, for his project connects with theirs principally in its naming. Where ignorance, in his view, drives science in a relatively straightforward way — ignorance discerned draws attention to lacunae in scientific knowledge, opens space for innovation in ways that are inspiring, energizing, exciting — for many of the analyses in the Proctor and Schiebinger volume, ignorance cloaks scientific discovery, hides it from view, produces ways of disabling or limiting it, impedes its progress, and is often cultivated to prevent its functioning otherwise. The contrast, as I have said, does not serve Firestein’s purposes well.

What, then, does Firestein offer his readers, agnotology aside? In his most convincing chapter, “The Quality of Ignorance”, Firestein claims that “In its less pejorative uses [ignorance...] describes a productive state of scholarship, experimentation, and hypothesizing” (56). Emphasizing the heuristic value of ignorance makes it possible for the lay reader to grasp something of its capacity to inspire, to energize scientists, to inform their applications for funding, and to convince funders of the value of the project — of what needs to be known, what gaps in knowledge cry out for investigation, why they should commit their funds and their reputations to support such inquiry. This is an eloquent plea for curiosity-driven research, which Firestein contrasts with hypothesis-driven research (77-79), indicating that he “hates” the latter, despite the earlier reference (56) I have cited. The curiosity he applauds is not diffused and generalized as it would be in a random pursuit of something to know, but is knowledgeable curiosity, knowing ignorance in the sense that it will be animated by an apt and indeed informed conception of what has to be/should be/is worthy of investigation beyond the limits of the already-known or already-shown-to-be-mistaken: and all of this for reasons that, demonstrably, matter. So this is not ignorance *tout court* or *tabula rasa* ignorance, but ignorance enacted by/in a mind prepared. (Indeed, Firestein quotes Louis Pasteur: “Chance favors the prepared mind”. p. 80) It is subtler than, more overtly knowledgeable, and other than the ignorance that permeates most of the analyses in the *Agnotology* volume.⁴

⁴ It is unfortunate, given the subject matter of this text that twice (p. 57-8, and p. 84) and each time within one page, the Nobel Prize is spelled once as “Noble” and once as “Nobel”!!

Now of course ignorance can and often does “drive science” in ways not quite analogous to those Firestein details: indeed, in other, more nefarious ways. To cite just three brief examples from the *Agnology* text: First, David Michaels observes: “It appears that the pharmaceutical industry is devoting sizable resources to the conduct of studies whose results will increase sales, but will not necessarily provide the information physicians need to select the best drug for their patients”.⁵ Here ignorance maintained drives science in directions other than those most clearly indicated by one set of social interests, to the neglect of another set. Criteria of responsible inquiry animated by a commitment to social justice would condemn the practices involved, and moral-political questions would be salient in ways they evidently are not, for the modalities of ignorance Firestein details. Second, tracing how eighteenth-century scientific knowledge about the abortifacient powers of the Caribbean peacock flower was suppressed and thus failed to travel from the New World into Europe, Londa Schiebinger observes that if the professor of botany in Amsterdam and his colleagues “had valued knowledge of how to manage women’s fertility, knowledge of the peacock flower and its uses would have quickly spread throughout Europe. But it did not.”⁶ Thus women failed to gain access to a resource that might have enabled them to take control of their reproductive lives, at a time long before contraceptive knowledge was widely available. Sustaining ignorance here is undoubtedly manipulative, and for patriarchal reasons, among others. Third, and with reference to social rather than “natural” science, Charles Mills shows how white ignorance of the implications of racism for non-white lives in the USA perpetuates moral and political injustices as fully as it attests to epistemic failure. He notes, for example, “The ignorance of the history of Jim Crow makes it possible to depict the playing field as historically level, so that current black poverty just proves black unwillingness to work. As individual memory is assisted through a larger social memory, so individual amnesia is then assisted by a larger collective amnesia.”⁷ I select these three examples to illustrate how ignorance can drive inquiry, by commission or omission, in ways that are neither as exhilarating nor as benign as those Firestein applauds: ways that play into going entrenched social-political prejudices and stereotypes, and cherished, if misguided, putative knowledge.

Now Firestein is clearly — or so it seems — not writing for philosophers who will take issue with matters such as those I have addressed, so to be fair it is appropriate in concluding these remarks to acknowledge the success of his account, especially in appealing to a public for whom “science” is primarily a coherent collection of established facts, often opaque and mysterious, but nonetheless with astonishing explanatory powers; and ignorance, by contrast, is deplorable and even perhaps paralyzing. In emphasizing the intelligence involved in recognizing the places where ignorance acknowledged opens the way to new discoveries, in three impressive case studies he details, and an autobiographical account, in the final chapters, Firestein draws his readers in to the excitement, the happenstance, and the serendipity of real engagement with places and subject matters where ignorance calls out for investigation and where remarkably innovative “discoveries” emerge, in consequence. The book culminates in these studies

⁵ David Michaels, “Manufactured Uncertainty”, in Proctor and Schiebinger, *Agnology*, p. 99.

⁶ Londa Schiebinger, “West Indian Abortifacients and the Making of Ignorance”, *Ibid.*, p. 151.

⁷ Charles Mills, “White Ignorance”, *Ibid.*, p. 242.

and with a well-framed recommendation, in the “Coda” for a “crash course in *citizen science* — a way to humanize science so that it can be both appreciated and judged by an informed citizenry” (p. 173). This aspect of its purpose the text realizes, admirably.

**Contact details: codelb@yorku.ca
<http://lorrainecode.com/>**