International Social Science Review

Volume 90 | Issue 2 Article 5

2015

Powerless Science?: Science & Politics in a Toxic World by Soraya Boudia & Nathalie Jas

Linda Quest
Pace University

Boudia, Soraya, and Nathalie Jas, eds. *Powerless Science?: Science and Politics in a Toxic World*. New York: Berghahn, 2014. ix + 280 pages. Hardcover, $95.00.

Powerless Science? is the second and most recent title in the series, *The Environment in History: International Perspectives,* sponsored by the European Society for Environmental History and the Rachel Carson Center. The editors did a heroic job of assembling and connecting a group of articles from contributors active in interdisciplinary research and studies. They span multiple disciplines (sociology, history, philosophy, economics, and political science), assorted methodologies, different time frames, venues, and geographies, as in cases from the United States, Italy, and Taiwan. The substantive proposition is that technological-scientific risks and hazards—particularly environmental contamination—are ongoing scientific, technological, social, and political problems.

The title question—*Powerless Science?*—recurs throughout the book. It refers to asymmetries of capability and situations. This involves disparities such as ones between knowledge and sufficient motivation to take a stand, unequal stakes between those affected and those benefiting. The introduction helpfully addresses "The Greatness and Misery of Science" (pp. 1-14). It stresses the correlation of wealth and well being as attributes of modernity with the act of putting substances into air, soil, water, and markets. Medicine, pesticides, food additives, petrochemistry, synthetic chemistry, and nuclear industries are toxicants that might (or not) have pathogenic effects—mutagenicity, carcinogenicity, and reproductive outcomes. The editors are emphatic that doing science requires questioning everything and treating any conclusion as tentative and partial. Uncertainty *always* remains. Curiosity and suspense build from chapter to chapter, so skipping back and forth enhances rather than spoils the effect. In reading, keep watch for asymmetries and also for analogies. We who are social scientists might be as culpable as the chemists and biochemists who participate in "hard science."

Powerless Science? characterizes the choices for scientists as very dire: defining dangers and making them visible versus obscuring them, providing resources for advocacy movements and regulatory systems, guaranteeing systems of regulation for prevention and management, claiming objectivity while putting forward some results and not others, doing more science versus diversionary activities such as academic publishing, educating the lay public, keeping grants coming, and other parts of the misery. "However, recognizing the difficulties … does not mean refraining from criticizing the choices made, and certainly not giving up on the long-term transformation of a society slowly poisoning itself." (p. 24)

Asymmetry is illustrated in the nineteenth-century case of John Snow, a British physician who accumulated five years of observations that indicated cholera was spread by contact. In London's 1854 cholera epidemic, he famously identified the Broad Street pump handle as the vector. He said that inaction would cost more than action. However, Snow's explanation went against received opinion of contemporary academic scientists, who held that cholera was airborne. Scientists trumped practitioners, and Snow was ignored. For this reason, precautionary measures were not taken. Characteristically, calling for "more research" delays action (p. 42). The editors' articles agree delay is a profitable strategy for industries. Delay puts off precautionary measures. Delay postpones protection of public and environmental health. Calls for further scientific experimentation buy time for vested interests. Who do we see doing it today?

During the 1970s, asymmetry in biochemical science was given a different tilt when industrial interests adopted the now-celebrated Ames test. Bruce N. Ames and his team built

their biochemistry upon prior research about radiation and cancer. Ames' work linked mutagenicity and carcinogenicity, using microbes developed from salmonella and *E coli* bacteria to show it. The work was denied funding by the American Cancer Association but supported by the U.S. Atomic Energy Commission. Suspicion and opposition were bypassed. Testing on microbes replaced testing on animals to screen chemicals for mutagenicity and carcinogenicity. Initially, manufactured chemicals were targeted. Industrialists were pleased by quickness, reliability, and low cost of the test (Ames supplied the microbes for free). Environmentalists were early enthusiasts but defected when the science was broadened to screening for and successfully identifying naturally arising mutagenic-carcinogenic chemicals in soil, air, and water. Wrangling among scientists over funding calmed when chromosomes and DNA damage were reconciled with X-ray and chemical harm, but cancer specialists became adversarial, arguing greater complexity *apropos* tumor-genesis. Ames continued his research, expanding it to oxygen radicals implicated in aging. Disclosure was accomplished through publication of scientific findings that made newsworthy stories (aging, hair dyes). The field of contestation moved away to political rivalries over environmentalism and governmental regulation.

What are we teaching in our Applied Social Science Methods courses? The importance is shown in the comparison of petrochemical regions in Italy and the United States. Researchers took science to people, emphasizing "epistemology from the bottom" (p. 153). In Italy the environment won. In the United States, popular results favored jobs over environment. The editors suggest that career-related tactics and methodological choices affected outcomes.

The model offered at the conclusion is a work in progress. The editors and their contributors have exposed a variety of asymmetries, uncertainties, disagreements, ignorance, discontinuities, and fractures that frustrate science. The editors note that the story in the twentieth century comes down to a single paradox: as chemists have proven to be more innovative in manufacturing and manipulating matter, their chemistries became more unpredictable.

In the twenty-first-century model the editors focus on "untangling ignorance" by developing a comparative perspective on ignorance as it is made, remade, and unmade in academic, governmental, industrial, and civil-society contexts (pp. 215-230). They assert that ignorance is both a dynamic feature of science and a regular outcome of scientific work. In summary, the absence of knowledge has powerfully shaped the history and social organization of our toxic world. And for this reason, *Powerless Science?* merits reading and reflective re-reading.

Linda Quest, Ph.D.
Professor of Political Science
Pace University
New York, New York