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Sara Shostak's "Exposed Science: Genes, the Environment, and the Politics of Population Health"

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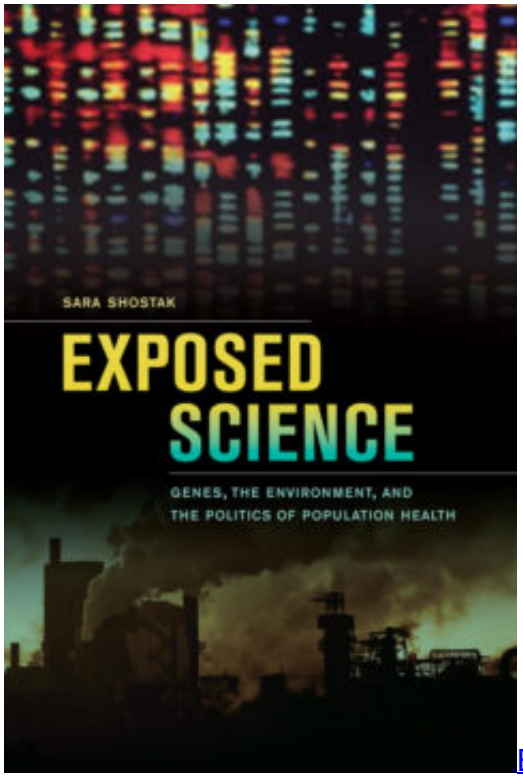
By McKenze M. Sigler



Exposed Science: Genes, the Environment, and the Politics of Population Health

by Sara Shostak

University of California Press, 2013, 312 pages

“Genetics loads the gun, but the environment pulls the trigger.” This turn of phrase, from Sara Shostak’s book *Exposed Science: Genes, the Environment, and the Politics of Population Health*, suggests that human variability and heredity is the underlying cause for most illnesses and while the environment is involved, it is not the sole perpetrator. It suggests that for some people, environmental exposure will lead to a reduction in health,

while for others—perhaps the lucky ones, or perhaps the ones with so-called “superior genes”—it will not. Alternatively, as has been the long-standing assumption in environmental health sciences, one can posit that “the dose makes the poison”, a phrase that ignores genetics by suggesting that the environment’s effect on human health depends on the amount of the exposure. So how does an individual—a scientist, a community member, a parent, or a lawmaker—reconcile these two seemingly discordant ideas? How does the human genome, exposure, the places where we live, or our familial lineage come into play?
Shostak’s *Exposed Science* both starts and ends with the quest for answers to these questions. In Shostak’s own words, “The central argument is that scientists’ perceptions of and responses to the structural vulnerabilities of the field of environmental health sciences have both intended and unintended consequences for what we know about the somatic vulnerabilities of our bodies to environment exposures” (Shostak 2013: 8-9). Sara Shostak is an Associate Professor of Sociology at Brandeis University. She brings a fresh perspective to the scientific discussion of environmental health, exploring the social implications behind new technologies and methodologies employed in environmental health research, toxicology, and their ever-increasing intersection with human genetics.

Shostak begins by taking readers on an objective, albeit slightly colorless, review of the history of the American government agencies that study environmental exposure and effects on the human body (namely, the National Institute of Environmental Health Sciences), and the political pressures and debates within and between these agencies in terms of what is studied, what is funded, and what scientists and the population at large stand to glean from it all. While this section is needed for the novice reader to understand the broader scope of the book, readers with experience in the subject area may find it dry.

Shostak continues by exploring questions around genetic susceptibility to environmental exposures, what motivates scientists to study gene-environment interactions, and what the consequences are to environmental health research that probes individuals at the molecular level. She details the evolution of environmental health sciences agencies from purely industry-regulating bodies to the rising idea that all human disease is—in one way or another—a genetic phenomenon. Shostak continues into the current and next phase of environmental health, which is human molecular research through sciences like molecular epidemiology and toxicogenomics. She then considers the social implications of these sciences. For instance, when we look at the molecular level, can the science be misrepresented to blame the victims of environmental exposures (who happen to be disproportionately represented among low-socioeconomic and minority groups)? In studying

their genome prior to exposure, are scientists laying the framework to later disprove alleged victims' claims of harm done through environmental exposure due to a preexisting "susceptibility"? Or, rather, are scientists creating biomarkers that can actually help in cases of environmental justice—benchmarks that prove changes to an individual's physical make-up occurred after the environmental exposure?

Exposed Science is an ideally crafted sociology of the environmental sciences, both for readers who have some background knowledge in the subject area and particularly for those who do not. Shostak's writing is accessible, but still academically written. She maintains objectivity by using consistent tone regardless of which side of an issue she is speaking to. Shostak delves deeply into history and science but brings the heavy research back to humanity in her refrains. Throughout the book, Shostak incorporates examples of how current areas of research affect individuals and communities through interlacing testimonies and real-life examples. This is a great read for anyone who cares to challenge the incentives behind scientific research, or for anyone who is interested in the relationships between social, environmental, and genetic determinants of health. Shostak aptly shows readers that sociocultural dynamics are ever-present even in a field largely considered to be black and white. *Exposed Science* is a remarkable read for scientists and activists alike, as well as the many players who make up the rest of the spectrum of perspectives.

McKenze Sigler is studying to become a Family Nurse Practitioner at Seattle University, where she will pursue a doctoral degree in nursing practice. She formerly worked at The Bill and Melinda Gates Foundation supporting global development initiatives.

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