BOOK AND FILM REVIEWS

Soraya Boudia and Nathalie Jas, *Powerless Science? Science and Politics in a Toxic World*. New York: Berghahn Books, 2014. Hardcover, 290 pp., $95. ISBN: 978-1-78238-236-2.

In the last twenty years, an increasing number of studies on toxic exposures have been published within anthropology, history, and the social sciences. These range from monographs that focus on particular types of exposure in specific places (Allen 2003; Fortun 2001; Murphy 2006; Petryna 2002), to edited volumes that collect interdisciplinary accounts of the making of toxic environs in diverse historical and geographical settings (Mitman, Murphy, and Sellers 2004; Kroll-Smith, Brown, and Gunter 2000; Sellers and Melling 2012; Boudia and Jas 2013). Such growth is perhaps related to one of the primary arguments made by Soraya Boudia and Nathalie Jas in their recently published edited volume, *Powerless Science? Science and Politics in a Toxic World.* According to Boudia and Jas (2014, 2), today more scientific knowledge and expertise, as well as national and international institutions, are devoted to the management of toxins and their effects than ever before. Despite this growth, problems surrounding contaminants and their health impacts remain 'far from being resolved'. Taking this lack of effective regulation as their starting point, the volume attempts to understand through what mechanisms toxicological, epidemiological, public health, and activist expertise becomes 'powerless', by which they seem to mean unable to bring about the effective regulation of toxicants.

Powerless Science? opens up many questions about the institutional and historical ways that scientific research, legal action, and environmental activism around toxicants have not resulted in effective regulation. However, despite what its title might lead one to believe, understanding whether or not science is powerless is not exactly what is at stake in the collection. Instead, this volume is an exploration of how power operates in diverse regulatory settings, resulting in the illustration of pathways as complex as those found in toxicological studies. In this regard, the book is not so much about 'science' as it is about how something called science is used in policy settings by institutional and noninstitutional actors with vested interests in the (de)regulation of specific toxins. Perhaps a more fitting title for the collection would be *The Use and Abuse of 'Science': How (Not) to Translate Expertise into Effective Toxicant Regulation,* or, *In the Name of Science: Toxic Relationships between Regulatory Actors, Complex Chemicals and Community Activists*. Unlike other studies of toxicity, which concentrate

on those impacted by toxins (Auyero and Swistun 2009; Blum 2011), or on scientists who study the impact of toxins (Fortun and Fortun 2005; Tousignant 2013), *Powerless Science?* seeks to investigate the 'management mechanisms' (Boudia and Jas 2014, 4) and "broader range of mechanisms, which have governed and organized the production and use of scientific knowledge, expertise and counter-expertise for the management of problems posed by toxicants" (Boudia and Jas 2014, 2).

I find such an emphasis on the mechanisms through which toxicity is managed interesting in that it echoes a recent shift in the field of toxicology, from researching effects to researching the mechanisms of effects. Operating in an age of presumed uncertainty (a characterization discussed in almost every chapter of the volume), it seems an increasing number of toxicologists view mechanism studies as the only means of potentially understanding toxic risks. As one toxicologist at the recent 50th Congress of the European Societies of Toxicology stated: 'Before we say there are effects or are no effects we have to understand the mechanisms' (Schönfelder 2014). According to toxicologists, the pursuit of research on mechanisms provides researchers with a means to clarify the uncertainty that surrounds toxicity. By understanding mechanisms of toxic exposure and effects, many toxicologists think they will better be able to provide convincing evidence that might lead to the effective regulation of complex exposures. Sheldon Krimsky's (2014, 247) chapter on low-dose exposure argues that mechanistic studies are akin to peeling an onion, with questions only increasing as more research is done. Nonetheless, today proving toxic effects has often become less important to toxicologists than discovering how exposure pathways work within the bodies of human and nonhuman animals.

Similarly, *Powerless Science?* does not investigate the effect of regulations, but instead the complex legal, institutional, and policy mechanisms through which regulatory decision making occurs. These mechanisms are not molecular pathways or epigenetic modifications, but legal proceedings (chapters 3 and 8), institutional responses to scientific activism (chapters 5, 6, and 7), and national and international assessment techniques (chapters 4 and 10), all of which are thought to enable or disable efficaciousness in the management of toxicity. In my research on reproductive and developmental toxicologists, I have noticed that emphasizing mechanisms sometimes leads research scientists to disconnect from what presumably drives their research: the harm caused by the toxin they study. With so much concentration on *how* toxins cause effects, sometimes the effects (from reduced sperm counts to birth defects to abnormal sexual development) fall out of the picture. A similar criticism

might be made of this volume. With so much emphasis on the processes through which regulatory decision making occurs, might research disconnect from the unequally distributed toxic body burdens, 'borne and paid primarily by subaltern social groups' (Barca 2014, 128)? By shifting focus to the processes of knowledge production that occur in-between science and policy, and by highlighting the (mis)translation of science into (in)effective toxicant regulation, the authors risk losing sight of what seems to have brought them to such research in the first place: animal, human, and environmental health in a toxic world.

But this is a risk worth taking. Understanding the specificities of how scientific research, institutional decision-making activities, and counter-expertise activism entangle to create regulation is perhaps exactly what is needed to understand why regulation has been so ineffective at protecting humans and environments from toxic harm. Furthermore, research into such mechanisms does not necessarily need to stand apart from research on toxic effects. As Kim Fortun and Mike Fortun (2005, 45) write of mechanistic studies in toxicological research, 'a key challenge is to manage the adoption of new technologies and techniques such that practical knowledge can result despite the complexity that these technologies and techniques bring into view.' A similar challenge exists in social scientific research on expert knowledge and knowledge production. Despite the complexity of regulatory decision-making processes, and even with the understanding of just how opportunistically regulatory institutions make use of and ignore expert knowledge, the collection still proves useful. I can imagine that understanding the historical background of the precautionary principle (chapter 1), the priorities of low-dose exposure research entities (chapter 11), or the details of Taiwan's first two legal cases of industrial pollution (chapter 8), will only complement the growing amount of anthropological work on the unequally distributed and detrimental effects of toxic exposures around the world. Taken in dialogue with other research, this volume makes a useful companion for understanding the institutional histories and practices that assist in limiting or allowing, ignoring or acknowledging, toxic exposures. The two types of research – studies of effects and mechanisms of effects – could then be understood not as oppositional, but as complementary.

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