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Nancy Langston. Toxic Bodies: Hormone Disruptors and the Legacy of DES.

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chapters that expertly weave together his analysis of the multiple and competing narratives of the atomic bomb in American society.

Chapter 1 begins with a discussion of the iconic status that radiation and the Nevada desert landscape achieved in American culture during the decade after the atomic bomb was first tested and used in war. Jacobs's observation on the pervasive place of animals (as signifiers of the "natural order") in atomic narratives is particularly perceptive. Stories of the thousands of animals that died during the nuclear weapons tests are contrasted with the Atomic Energy Commission's and civil defense officials' attempts to portray nuclear weapons as benign by circulating cartoon illustrations of men with horses, contentedly sharing the horizon with the mushroom cloud. Likewise, Jacobs shows how difficult it was for these "official" narratives to take hold given the popularity of science fiction films, with their mutant animals—bugs, sea creatures, rats, and so on—depicting the natural order as anything but balanced by nuclear weapons.

Chapter 2 is about nuclear fallout after 1954, when the destructive force of the Bravo Shot made it impossible for the AEC to continue controlling the narrative on its health and environmental effects. By contrasting the AEC's banal assurances that fallout was harmless with the stories of cancer and genetic defects within downwinder communities that began to dominate the American media, as well as the five-hundred-plus science fiction films depicting atomic horrors, Jacobs nicely captures the multiplicity of atomic messages that Americans had to grapple with during the 1950s.

Chapter 3 focuses on social scientists and atomic issues. Several social scientists studied the effects of the bomb on American society, while others used the bomb as a case study for examining humans' natural propensity for violence, and still others called on their colleagues to speak out against the bomb. Jacobs also discusses the social scientists who were put to work on behalf of the bomb, either in places like the RAND Corporation, where a social scientist first articulated deterrence theory and others studied the psychological impact of nuclear war, or in universities that were contracted by the U.S. Army and government to prepare and motivate soldiers to fight in a nuclear war.

Chapter 4 looks at three competing survival narratives: the optimistic tales told in civil defense literature; the much grimmer scenarios of limited survival, total social breakdown, and complete devastation presented in popular books and films; and the stories of Hiroshima

and Nagasaki survivors (twenty-five of whom were brought to the United States for reconstructive surgery), which made it even less likely that Americans would unquestioningly swallow the stories of victory told to them by the government. Chapter 5 examines the stories of the downwinders and servicemen who were most heavily exposed to fallout during the weapons testing program. While somewhat repetitive, Jacobs's analysis of the multiple and conflicting stories told by the American government and the AEC is a compelling illustration of the deceit behind so much of the American nuclear weapons program.

Chapter 6 is devoted to a discussion of the children of the atomic age: the propaganda films delivering the message of calm and assurance, the films and science fiction stories depicting atomic horrors, and the reactions of children to their nuclear reality. It is in his conclusion to this chapter that Jacobs spins a tale of optimism, arguing that growing up under a cloud of doom influenced the baby boomer generation to lash out against established authority in the 1960s. I found myself agreeing with his explanation for the rise of student activism and the New Left, but I thought he could have taken the analysis further to examine how the nuclear age (and the feeling of powerlessness it inspired in so many people) caused the inertia of so many others of that generation.

On the whole, this book would make a wonderful addition to any undergraduate or graduate course in American history. Jacobs takes on a topic that has been widely written about and offers a fresh, intelligent, and engaging perspective—and he does this in only 121 pages!

LISA RUMIEL

Nancy Langston. *Toxic Bodies: Hormone Disruptors and the Legacy of DES.* xiv + 233 pp., illus., bibl., index. New Haven, Conn./London: Yale University Press, 2010. \$30 (cloth).

Over a half century ago, the field of medicine took a bold step by expanding its *raison d'être* from curing and treating disease to encompassing a larger palette of treatments and services. Medicine had begun taking on the additional roles of disease prevention, restoring declining or lost bodily functions, enhancement, infertility treatment, and, more recently, predictive genetics. The big change for endocrinology came in the 1930s, with the development of synthetic hormones.

Toxic Bodies, authored by the University of Wisconsin environmental scientist Nancy Lang-

ston, provides a compelling analysis of the regulatory history of the first synthetic estrogen approved by the U.S. Food and Drug Administration for “treatment” of pregnant women. Known by its popular acronym DES, diethylstilbestrol was widely acclaimed for its clinical potential to treat dozens of conditions. The Swedish scholar Ingar Palmlund found off-label uses of DES from *Index Medicus* that included the treatment of infertility, nausea, early labor, and “excessive” height in young women.

Langston offers as her primary reason for writing the book her search for the answer to the query, Given the knowledge that DES “caused cancer and altered sexual development in fetuses, why did the FDA approve its use in 1941?” (p. 44).

What sets Langston apart from other scholars who have investigated the history of DES is that she gained access to and pored over a trove of DES files at the National Archives and the archives of the FDA. Her investigations led her to internal agency memos, reports, and interviews of scientists and regulators involved with the assessment, promotion, or regulation of DES. Her recreation of the discussions that took place between 1940 and 1970, within the FDA and among endocrinologists, obstetricians, and gynecologists, provides a fine-structured, nuanced analysis of the *Sturm und Drang* within the agency when it was debating whether to approve DES for reducing the hot flashes of menopausal women and preventing miscarriages and as a growth promoter for chickens and cows.

From *Toxic Bodies* we learn that scientists, who were caught up in the web of drug development and the emerging system of factory farming, used a variety of rationalizations, often without empirical evidence, to support their claims that DES was a safe drug. The author offers the DES case as a lens through which to view other uses of endocrine-disrupting chemicals, most of which have been introduced into commerce without premarket testing.

Langston’s narrative about the FDA’s handling of DES underscores three principles of regulation. First, regulatory decisions are heavily political and do not necessarily follow the best science even when that science is supported by employees of the agency. Second, regulatory bodies do not see their role as minimizing social risk but, rather, as managing it. Thus, the agency makes decisions that impose risks on consumers, who, if properly informed, would not accept them. Third, regulators see themselves as positioned between private interest groups (corporations and business interests) and public interest groups (consumer groups and the public), but

they often follow the interests of the most powerful and politically influential group. Langston shows us how the drug and livestock industry used litigation, political alliances, and purchased “science” to influence agency decisions. She writes: “Letters between companies and FDA regulators reveal that both groups feared that if women ever saw how many potential risks DES presented, they might refuse to take the drug. Worse, someone might take the drug, then sue the company, the prescribing doctors, and possibly the FDA if she developed cancer” (p. 44).

The regulatory tale of DES told in *Toxic Bodies* is not a clear case of agency capture. Langston offers a more nuanced view. The effort for DES approval led to intra-agency conflicts. But the heavy lobbying of drug companies, the appointment of a pro-industry FDA commissioner, and extensive promotions by drug manufacturers to physicians tipped the scales—despite the agency’s early resistance to approving the drug. Langston’s archival research shows that “in 1941 the FDA had insisted that [DES] was contraindicated for pregnant women because of possible risks to the uterus and that women who wished to have children in the future should never take DES” (p. 49).

It is a bit of a stretch, however, to draw too many implications from regulating drugs to regulating industrial chemicals like bisphenol A, because the latter fall under a different set of regulatory provisions and a different burden of proof for “acceptable risk.” One of the reasons it takes so long to regulate a single chemical is that the rules that define unacceptable social risk are bathed in ambiguity, which makes them more vulnerable to political and economic delaying tactics. *Toxic Bodies* navigates skillfully through the minefields of contested science and regulatory anomie.

SHELDON KRIMSKY

David E. Nye. *When the Lights Went Out: A History of Blackouts in America.* x + 292 pp., illus., index. Cambridge, Mass./London: MIT Press, 2010. \$27.95 (cloth).

There is no doubt that a big electrical blackout is dramatic. Most people involved in one remember for a long time afterward just where they were when it happened—indeed, David Nye has his own memory of the Great Northeastern Blackout of 1965. And, to some degree or another, everyone understands that huge disruptions in the electrical supply are enormously expensive, as well as inconvenient and disorienting. But Nye argues in *When the Lights Went Out* that blackouts are much more than all that,