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Nuclear Others

BY ALEX WELLERSTEIN*

GABRIELLE HECHT. *Being Nuclear: Africans and the Global Uranium Trade*. Cambridge, MA: MIT Press, 2012. xx + 451 pp., illus., maps, index. ISBN 978-0-262-01726-1. \$29.95 (hardcover).

Nuclear history, as a field, came of age in the late and post–Cold War. Part of this fact is definitional: the line between “history” and “policy” takes some time to manifest and solidify, generally speaking. But some of this formation, perhaps most of it, came from the revelation of new sources—although historians are usually quick to point out that new history is typically the result of new interpretations, not new documents. There is some truth to the historians’ rejoinder, but in the nuclear world, attention to the mediating effect of the entwined practices of secrecy and revelation is always necessary.

The result is that we have, in many ways, a very skewed nuclear historiography. The United States is, unsurprisingly, vastly overrepresented. Part of this is because of its central role in the birth of the “atomic age,” but another part is the source base. As Richard Hewlett, the historian of the U.S. Atomic Energy Commission, wrote:

The records have survived. For this, scholars can thank two much-maligned practices of the bureaucracy: classification and multiple copies. Classified documents endure; they do not disappear from the files as souvenirs. As for copies in sextuplicate, their survival is a matter of simple arithmetic. If the original in one agency is destroyed, the chances are better than even that one of the five carbons will escape the flames in another.¹

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1. Richard G. Hewlett and Oscar E. Anderson, Jr., *The New World, 1939–1946: A History of the United States Atomic Energy Commission*, vol. I (University Park: Pennsylvania State University Press, 1962), 657.

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Hewlett neglected to mention that the reason that these files are not taken as souvenirs is because U.S. law dishes out heavy penalties should anyone do so. (There were, in fact, a number of cases of G.I.s doing just this in the wake of the Manhattan Project, and they faced real jail time.²) For those of us who neither have nor desire “Q Clearances,” accessing those records is a bit more difficult than it was for Hewlett (who did have a clearance), but the sheer volume of declassified materials is still immense, and the Freedom of Information Act, for all of its deficits, has still proven to be a powerful tool for researchers.

But this American dominance in the scholarly literature is also a consequence of the fact that the United States has been historicizing its nuclear program far longer than anyone else. No other country has released anything as broad as the Smyth Report, which was railroaded through in the twin interests of democracy and security only days after the bombing of Nagasaki. It was meant to be known as the “Atomic Bombs” report—the title was supposed to be applied just before release with a rubber stamp and red ink—but only a handful were actually so labeled, and thus its clumsy subtitle (*Atomic Energy for Military Purposes*) became the title, which in turn prompted the need to abbreviate it with the name of its author, Princeton physicist Henry DeWolf Smyth. This report arguably set the pattern for all future U.S. histories of the bomb, and kicked off an obsession with American nuclear history that has continued to drive historians and journalists to this day.³

No other nation has such a rich (and, unfortunately, repetitive) nuclear historiography. A number of excellent official histories have been published about the nuclear work of the United Kingdom, but the country always had a junior role compared to the two superpowers. In the early post–Cold War, a handful of pathbreaking histories of the Soviet nuclear program were published in the wake of briefly opened archives.⁴ An enterprise of “nuclear salvage history,” as Hugh Gusterson has dubbed it, flourished during the Yeltsin years, for the first

2. Alexander von der Luft and Ernest D. Wallis, ex-sergeants, were indicted in the summer of 1947 for taking “souvenirs” relating to the Manhattan Project. Both plead guilty and were able to receive relatively light sentences of parole and probation. “Atomic Souvenirs,” *Time* (21 Jul 1947); “A-Bomb Data Theft Draws 4-Yr. Parole,” *Washington Post* (22 Aug 1947), 21; “Wallis on Probation,” *Washington Post* (23 Apr 1948), 21.

3. On the Smyth Report, see esp. Rebecca Press Schwartz, “The Making of the History of the Atomic Bomb: Henry DeWolf Smyth and the Historiography of the Manhattan Project” (PhD dissertation, Princeton University, 2008).

4. David Holloway, *Stalin and the Bomb: The Soviet Union and Atomic Energy, 1939–1956* (New Haven, CT: Yale University Press, 1994); Richard Rhodes, *Dark Sun: The Making of the Hydrogen Bomb* (New York: Simon & Schuster, 1995); and more recently, Alexei B. Kojevnikov, *Stalin’s Great Science: The Times and Adventures of Soviet Physicists* (London: Imperial College Press, 2004).

time, putting names to achievements and creating something of a public Soviet national nuclear narrative.⁵

The French, Chinese, Indian, Pakistani, and Israeli nuclear programs have considerably less historical documentation: for each country there are generally only one or two major historical monographs, if that. Ironically, the history of the never-admitted Israeli bomb is probably better known than the histories of the Chinese or French nuclear arsenals—because the U.S. intelligence agencies have been more successful in learning about the Israeli program than the others.⁶ Much of the history of nuclear proliferation is written from what is literally a view-from-above: the product of half a century's worth of overflights and satellite photography funded by American taxpayers and released decades later. The culmination of this genre is Jeffrey Richelson's *Spying on the Bomb*, a 700-page monolith of American nuclear intelligence data on thirteen national nuclear programs, meticulously tracking what Americans thought they knew.⁷ Richelson's work is impressive, but these digested intelligence accounts turn nuclear history into something quite different from what one is used to from the more "internal" histories provided by, say, Richard Rhodes or David Holloway. There are very few scientists, for example, in Richelson's account of numerous national programs. Instead we see facilities, movements of materials, and speculations on high-level policy and its intent. This is nuclear history from (at least) 70,000 feet; it becomes most interesting when showing the divergences between intelligence estimates and realities, such as when the Chinese test of a uranium-fueled implosion bomb caught the head of the Atomic Energy Commission flat-footed.

Few works have probed that difference between the estimates and the realities. Michael Gordin's recent *Red Cloud at Dawn* is perhaps the canonical example of what such an account could look like.⁸ A history of the Soviets' first nuclear test, and its detection by the United States, Gordin's book manages to give us simultaneous internal and external accounts of the Soviet and American nuclear programs. We learn what the Americans thought they knew about the

5. Hugh Gusterson, "Death of the Authors of Death: Prestige and Creativity among Nuclear Weapons Scientists," in *Scientific Authorship: Credit and Intellectual Property in Science*, ed. Mario Biagioli and Peter Galison (New York: Routledge, 2003), 281–307.

6. See in particular Avner Cohen, *Israel and the Bomb* (New York: Columbia University Press, 1998) and Avner Cohen, *Israel's Worst-Kept Secret* (New York: Columbia University Press, 2010).

7. Jeffrey Richelson, *Spying on the Bomb: American Nuclear Intelligence from Nazi Germany to Iran and North Korea* (New York: Norton, 2006).

8. Michael Gordin, *Red Cloud at Dawn: Truman, Stalin, and the End of the Atomic Monopoly* (New York: Farrar, Straus and Giroux, 2009).

Soviets, and what the Soviets thought they knew about the Americans; we also learn about the divergences between these accounts, and how they shaped vastly important decisions in the early Cold War—like whether to build a hydrogen bomb, or even whether Truman ought to announce that his scientists believed that the Soviets had the bomb. (Truman himself was dubious that it was a bomb, despite the assurances of his experts, because he considered the Soviets to be too backwards to pull off such an accomplishment. He announced it anyway, though, because he feared that the Soviets would announce it first and he wanted to deny them a propaganda coup. Gordin reports that there is no evidence that the Soviets had any intention of advertising their new nuclear capabilities, however.)

To this busy field we welcome a new addition: Gabrielle Hecht's *Being Nuclear*. Hecht's book is a history of uranium mining and milling in Africa, and the ways in which late- and post-Cold War politics intersected with the end of colonialism. The theoretical framework that Hecht brings to this is the concept of what she calls "nuclearity": the quality of being "nuclear." In short form, debates over "nuclearity" are disputes about the ontological status of various industries or technologies that can have their nonstandard, "nuclear" aspects either emphasized (nuclear exceptionalism) or deemphasized (banalization).⁹

"Nuclearity" is a new piece of jargon coined to describe a phenomenon well known to nuclear scholars and observers. Whether a nuclear reactor is to be considered an exceptionally unusual (from a safety and security standpoint) way to generate power, or whether it is "essentially a giant tea-kettle," is an argument that has persisted since the antinuclear power movement really got under way in the early 1970s. Whether the first atomic bombs were "special" weapons—to use their historical code-name, S-1—or simply an expedient form of firebombing

9. Hecht has been developing the concept of "nuclearity" for some time now, and some of the chapters in this volume are derived from her earlier work: Gabrielle Hecht, "Rupture-Talk in the Nuclear Age: Conjugating Colonial Power in Africa," *Social Studies of Science* 32, nos. 5/6 (2002): 691–728; Gabrielle Hecht, "Negotiating Global Nuclearities: Apartheid, Decolonization, and the Cold War in the Making of the IAEA," *Osiris* 21 (2006): 25–48; Gabrielle Hecht, "The Power of Nuclear Things," *Technology and Culture* 51 (2010): 1–30; Gabrielle Hecht, "On the Fallacies of Cold War Nostalgia: Capitalism, Colonialism, and South African Nuclear Geographies," in *Entangled Geographies: Empire and Technopolitics in the Global Cold War*, ed. Gabrielle Hecht (Cambridge, MA: MIT Press, 2011), 75–100. Though she did not yet label it as "nuclearity," the concern about the prestige of the "nuclear" also pervades her first book, *The Radiance of France: Nuclear Power and National Identity after World War II* (Cambridge, MA: MIT Press, 1998).

was a debate that began shortly after the bombing of Hiroshima.¹⁰ There are, for different people at different times and for different reasons, high stakes associated with the question of whether “nuclear” things should be treated differently than “non-nuclear” things. On average, exceptionalism has won the day, and only in the face of immense political or economic pressures (promotion of nuclear power, for example) has banalization found much traction.¹¹ In the American case, exceptionalism has long been the rule: the Atomic Energy Act, for example, gave the government unprecedented powers over the production of nuclear science and technology, and the United States (along with the United Kingdom and Canada) early on sought to monopolize worldwide uranium reserves as what would be termed today a novel counterproliferation strategy.¹²

The uranium trade is a novel place to apply this analysis, however, and Africa is a novel place for *any* discussion of nuclear history. Africa as a continent has been conspicuously missing from our nuclear narratives, despite its numerous obvious inroads. Case in point: the uranium that was fed into the first American reactors and enrichment plants came primarily from the Belgian Congo. Case in point: France tested its first nuclear weapons in Algerian Sahara, shortly before Algerian independence. Case in point: South Africa not only was (and remains) a major source of uranium ore to the rest of the world, it also developed operational nuclear weapons under apartheid, and using a different enrichment method than any other nuclear program before or since. Case in point: Africa is thought today to hold at least a fifth of the world’s uranium reserves.

And yet, Africa is not generally considered a “nuclear” continent. Nuclear narratives are either explicitly Western or explicitly Eastern, and Africa somehow fits into neither, despite sitting both figuratively and literally between these extremes. Hecht’s narrative finally gives the continent its due, situating it centrally within the nuclear world.

Uranium mining is a subject that has been discussed historically in some detail, but primarily from the perspective of the United States (again), whose

10. Michael Gordin, *Five Days in August: How World War II Became a Nuclear War* (Princeton, NJ: Princeton University Press, 2007).

11. Spencer Weart, *Nuclear Fear: A History of Images* (Cambridge, MA: Harvard University Press, 1988), and its revised edition, *The Rise of Nuclear Fear* (Cambridge, MA: Harvard University Press, 2012).

12. Hewlett and Anderson, *New World* (ref. 1), chap. 14; Jonathan E. Helmreich, *Gathering Rare Ores: The Diplomacy of Uranium Acquisition, 1943–1954* (Princeton, NJ: Princeton University Press, 1986).

legal monopsony on uranium ores had notoriously toxic consequences on the Navaho, Mormons, and itinerant hard-rock miners who were spurred by ore price guarantees in the 1950s to dig out said ores in the American Southwest.¹³ The traditional narrative of uranium mining is one of abuse and neglect, especially with regard to the “others” who always end up doing the dirty (and toxic) work of mining. Uranium ore emits radon into the air, and this radon decays into short-lived, high-energy “daughter” products. Inhaled into the lungs—especially when piggybacking onto dust or tobacco products—these “daughter” products significantly increase the incidence of lung cancer among these populations over a time horizon of several decades. Time and time again this had led to catastrophic outcomes for the mining communities. Radon is a literally invisible, long-term, hard-to-measure, inherently probabilistic threat; “safe” operation of such mines (“safety” always being a relative term in hard-rock mining) requires expensive and difficult-to-operate ventilation and filtration equipment, stringent monitoring of and cooperation by workers, and invariably cuts into the bottom line. In the United States, the Atomic Energy Commission, despite its monopsony and far-reaching regulatory powers of all things “nuclear,” deferred regulating radon in mines in the name of both jurisdictional issues and scientific uncertainty, putting it off until the perceived national security needs for domestic uranium ore production were met.

The African case, in Hecht’s telling, is a very similar story. She looks at the experience of uranium mining (and to a lesser extent, milling—the conversion of the raw ore into yellowcake, which involves its own radon hazards) in Gabon, Madagascar, Namibia, and South Africa (and to a lesser extent, Niger and the Democratic Republic of Congo). Hecht’s story is colonial and post-colonial, apartheid and post-apartheid: the first two were French colonies until the early 1960s, and maintained strong French ties even after decolonization; Namibia was under the control of South Africa until the end of apartheid in 1990. The colonial side of this is very similar to the American experience: the French and apartheid South African governments found various ways—sometimes subtle, sometimes not—to avoid serious action with regard to the radiation exposure of black African miners. To be fair (if this is even the right term in this ghastly context), it becomes clear that they also did little regarding the

13. For example, Michael A. Amundson, *Yellowcake Towns: Uranium Mining Communities in the American West* (Boulder: University Press of Colorado, 2002); Howard Ball, *Cancer Factories: America’s Tragic Quest for Uranium Self-Sufficiency* (Westport, CT: Greenwood Press, 1993); Raye C. Ringholtz, *Uranium Frenzy: Saga of the Nuclear West* (Logan: Utah State University Press, 2002).

radiation exposure of white miners and mine employees as well; their negligence was general, even if their labor force (and what was expected of it) was not.

The post-colonial situation is more curious. As part of decolonization, France pushed for agreements that would give them sole access to the uranium ores of their former colonies, in return for security assurances. Yet the post-colonial states were also able to use uranium access—and pricing—as a point in later negotiations. Here is one of the axes of Hecht's "nuclearity" analysis: the emergence of a uranium "market," itself an odd, late-Cold War creation that balanced these themes of exceptionalism and banality as uranium began to emerge as a commodity that could be haggled over, as opposed to an ore controlled by overlapping monopsonies and monopolies.

Hecht's most prominent example of this nuclear haggling is as follows: Gabonese President Omar Bongo argued that uranium was a banal commodity, and should have its price set by the producers (as was the case with oil post-1973). By contrast, President Hamani Diori of the Republic of Niger argued that uranium was an exceptional commodity because of its connection with nuclear technology, and this consideration should be factored into its price (again by the producers). "In the boundary between banality and exceptionalism," Hecht argues, "Bongo and Diori each sought a separate foothold in the uranium market, and on the sovereignty that it could help them enact" (116).

The other axis for "nuclearity" in Hecht's account is occupational health. Here "nuclearity" refers more to whether the specifically radioactive effects of uranium mining were even kept track of, much less whether they were acted upon. France, she argues, believed in the special nature of uranium mining when it was done in the metropole, but not when it was done in a colony or former colony. (Even though, as Hecht points out, the uranium miners in the metropole got cancer, too.)

What "nuclearity" does well, as a concept, is draw our attention to the constructedness of the category of the "nuclear," which is useful for an area of history that easily falls prey to technological determinism.¹⁴ Hecht also emphasizes, correctly, that even being aware of nuclear hazards requires extensive networks of instruments and institutions. It is easy for negligent regulatory institutions to make radon, as a problem, become "invisible": just don't tell the

14. Ironically, one of the most technologically deterministic arguments about nuclear technology comes from a classic essay against technological determinism ("The bomb is, of course, a special case"): Langdon Winner, "Do Artifacts Have Politics?" *Daedalus* 109, no. 1 (1980): 121–36, on 131.

workers about it, don't issue them film badges, don't sample the air, and, if you did take data, keep it secret. Making radon "visible" is the far more difficult proposition.

There is one deep irony, though, that runs through Hecht's book: we still see almost everything from the perspective of the colonial powers, and their record-keeping practices were thoroughly compromised. This is due to the inherent source limitations of such a subject. The French nuclear archives are notoriously difficult to access (as Hecht describes in an amusing postscript). Whether this is because they fall under the heightened secrecy that "nuclear" matters often do, or just because the archival system is purposefully or accidentally difficult to use, is unknown. (The motivations and operations of secrecy are, unsurprisingly and perhaps tautologically, often themselves secret.) The South Africans destroyed their records at the end of apartheid. The mining companies often didn't make useful records in the first place, much less kept them, much less organized those that were kept—for the same reasons they did not want to put in the work to make radon visible, lest they then be accountable to regulation.

There are, to be sure, witnesses. But when Hecht traveled to Africa, she found considerable numbers of former uranium miners who were not even aware that they had been uranium miners. Many did not understand what uranium was (other than something that white-skinned people paid money for), much less the probabilistic risks associated with radiation (a hard concept to swallow even for moderately educated citizens of Western countries). In Madagascar, the miners had not even heard of nuclear weapons. "You crazy *vazahas* [foreigners]," one man told her, "why do you want this stuff?" (222).

It is clear that the French were generally unconcerned about the radiation exposure of African miners, though it is also clear that they underestimated the importance of that of French miners as well. The South Africans similarly found ways to ignore the exposures of black miners—another crime to add to apartheid's cruel legacy. But as Hecht points out, neither of these situations were immediately remediated by awareness or even more benevolent governments. Neither the states nor the miners wanted to shut down the mines altogether, as they were too important as sources of national and individual income. And so a long, slow game between labor and management has played out regarding occupational health and scientific uncertainties. That these ambivalences continued in various forms into the post-colonial and post-apartheid eras is also, perhaps, not surprising: the combination of money to be made (by both owners and workers) and a morass of difficult-to-measure,

difficult-to-remediate, thoroughly probabilistic risks seems almost destined to result in poor regulatory solutions, even in countries with strong regulatory cultures.¹⁵

To come full circle, *Being Nuclear* occupies an unusual place within our standard nuclear narratives. It is neither an internal history nor an external one: it takes residence some place in between, tacking between moments of each. It is reflexive about the problem of “nuclear knowledge”: it draws attention to, explicitly, the ways in which the very possibility of these histories can, or cannot, be written. Epistemological concerns are the provenance of all historians, to be sure, but the problems of nuclear history are not those of the archive damaged by fire or war, or even of the fickle individual who destroys or doctors his or her files. They sit, in perhaps an exceptional way, at the troublesome intersection of security, safety, and governmentality; they promise to be variously inaccessible as long as the infrastructures that support them survive.¹⁶

15. Ellen Bales, “An Element of Uncertainty: Radon and the Quantification of Risk in 20th-Century America, 1945–2000” (PhD dissertation, University of California, Berkeley, 2009).

16. And perhaps even longer: in the 1950s, the U.S. government did conduct research to see how business and governmental archives would weather a nuclear strike. They found that, in general, heavy filing cabinets buried deep in heavy government buildings did well under such circumstances; one suspects the clerks who staffed them would not have fared so well. “Operation Teapot, Project 35.5 (Febr–May 1955): Effects of a Nuclear Explosion on Records and Records Storage Equipment (WT-1191)” (18 Jun 1958), copy in the Nuclear Testing Archive, Las Vegas, NV, document NV0051120.