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Kate Brown, *Plutopia: Nuclear Families, Atomic Cities, and the Great Soviet and American Plutonium Disasters* (Oxford: Oxford University Press, 2013) ISBN 978-0199855766

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Introduction by Christopher F. Jones, Arizona State University

The Cold War can be described as a period of opposites: capitalist versus communist; open versus closed; West versus East. While the United States and Soviet Union were, of course, two sides of the same coin in a global pursuit of power, their differences typically attract much more attention than their similarities. This is true of most historical accounts, and it is true of many historical actors as well. Leading figures in the United States and Soviet Union often proclaimed the distinctions between the superpowers as they sought legitimation for their actions from their citizens and the international community.

But as **Kate Brown** argues in her award-winning book ***Plutopia***, the similarities merit further attention. Focusing on the towns and workers connected to plutonium processing plants—Richland/Hanford in the United States; Ozersk/Cheliabinsk in the Soviet Union—she weaves a tale that reveals unexpected parallels in the creation of communities, with both positive and negative consequences for those who lived and worked nearby. In both of these "plutopias" residents obtained and fought to preserve a high material quality of life with better pay, housing, and access to goods than they could have expected in the absence of a nuclear facility. Such benefits, however, came at the price of dishonest governments, unequal treatment of laborers, radiated bodies, and poisoned environments. And for those who resided beyond the gated barriers filled with government sponsored material abundance, plutonium production spawned cancers and mysterious illnesses with little to no prospect for compensation.

Those who crack the cover of *Plutopia* will quickly understand why the book has earned such prodigious praise, including winning the George Perkins Marsh Prize for best book in environmental history from the American Society for Environmental History, the Ellis H. Hawley prize from the Organization of American Historians, the Wayne S. Vucinich Book Prize from the Association for Slavic Studies, East European, and Eurasian Studies, and most recently, the Albert J. Beveridge award from the American Historical Association. Here I will highlight just three of the book's outstanding features before turning to our reviewers. First, the writing dazzles. Environmental historians frequently invoke the benefits of narrative, but as all writers know, theory is much easier than implementation. Brown's prose crisply and engagingly guides the reader through the book's narrative arc. The fascinating comparative dimensions of *Plutopia* provide a second point of intrigue, as her story reveals provocative and unexpected linkages between the Soviet Union and the United States. Third, Brown skillfully links the broad global struggle of the Cold War to individuals. While never losing sight of the abstractions of the nuclear world and international geopolitics, she grounds these grand forces in the bodies and lived experiences of everyday people living and working in plutopias.

Like all good books, *Plutopia* answers many questions while generatively raising others, making it an ideal candidate for this roundtable forum. As our distinguished

reviewers note, Brown's analysis encourages further reflection about the advantages and limitations of international comparisons, the place of nuclear developments in national histories, the role of the historian as narrator, and the reasons communities accept environmental risks in exchange for material gain.

I invited **Paul Josephson** of Colby College to provide comments because of his deep expertise in Soviet science, technology, and the environment. A prolific author, Josephson has written a dozen books dealing with topics ranging from nuclear technology to everyday objects such as soda cans. His latest book, *The Conquest of the Russian Arctic*, was recently published by Harvard University Press (June, 2014).

I was pleased that **Kristen Iversen**, director of the PhD program in Creative Nonfiction at the University of Cincinnati, agreed to join the panel. Author of numerous award-winning books, including *Full Body Burden: Growing Up in the Nuclear Shadow of Rocky Flats* (Crown, 2012), her work highlights the individual experiences and consequences of exposure to radiation. Iversen is extremely active in making connections between historical scholarship and public audiences; to this end, she has worked extensively with a variety of media outlets including NPR, BBC, and A&E Biography.

Jacob Darwin Hamblin of Oregon State University completes our panel. He has written extensively on science, the Cold War, and nuclear technology. His latest book, *Arming Mother Nature* (Oxford, 2013), was named the winner of the 2014 Paul Birdsall Prize from the American Historical Association. It was also the subject of a recent *H-Environment Roundtable Review* that can be accessed here. Readers of this forum will of course recognize that Hamblin was the founder of this series, and so I am deeply grateful that he was willing to spend some of his "retirement" time from editing duties to engage as a reviewer.

Thanks are in order for all the participants taking part in this roundtable. In addition, I would like to remind readers that as an open-access forum, all *H-Environment Roundtable Reviews* are available to scholars and non-scholars alike, around the world, free of charge. Please circulate.

Comments by Paul Josephson, Colby College

I recommend highly reading Kate Brown's engaging, thought-provoking, and well-researched *Plutopia*. This book is a comparison of two Cold War Communities, Richland (Hanford), Washington, and Ozersk (Cheliabinsk), Russia, whose resident political bosses, managers, scientists, workers, military people, journalists, and others engaged in plutonium production to make nuclear bombs. Brown draws vivid and well-taken comparisons of the hiring of workers to build the cities; the enlistment of specialists to design and operate facilities; class, family, and other social considerations; the nature and activities of the security regime in the facilities; and the extensive and haphazard disposal of radioactive wastes connected with bomb production, often in thickly settled areas. The latter occurred inadequate concern for people or environment and with difficult-to-determine, but clearly long term, damaging, and in many cases mortal genetic and mutagenic impacts for humans, flora, and fauna. Brown's engaging writing style is a pleasure to read even as she handles difficult technical issues. She interweaves interviews with documentary evidence like a story-teller in a series of short but engaging chapters, usually in parallel sections or chapters (US then the USSR).

Race, class and gender motivate much of Brown's work. In *Plutopia* Brown discusses the efforts of the authorities in the USSR and US under the cover of "top secrecy" to create ideal family communities dedicated to the creation of weapons of mass destruction. Brown reveals the class nature of the organization of living and working arrangements in Richland, Washington, the conscious isolation of workers from managers, the segregation of blacks from whites with Jim Crow laws, the gendering of in the hazardous plutonium facilities, and the obfuscation of the authorities – and their frequent deceitfulness – about the hazards of life in the zone. She documents how the Army Corps of Engineers, DuPont and General Electric put citizens at grave risk and laundered data that revealed the risk.

While there were no racial minorities in plutopia in the USSR, there was class and status in the self-proclaimed "classless society." Brown explains why plutopian residents in the USSR came to be thrilled to live in closed cities. They and their American counterparts gained middle-class status in planned communities with well-stocked stores and first-rate schools for their children and other perquisites not widely available. And she uncovers how these people paid with their health – and how the environment continues to pay – because of the emphasis on production, the double-speak of managers, and the cloud over safety imposed by the moniker of "top secret" that enabled higher exposures than morally-sound, haphazard waste dumping, and so on. Brown characterizes Richland and Ozersk as "slow motion disasters."

I would have liked to see a few issues covered in greater detail. Some of them might be of interest to Cold War historians, historians of the former Soviet Union, and historians of technology. A first point centers on urban history. To what extent was

Ozersk different from other Soviet cities? After all, all Soviet cities were "planned" in one way or another. How, beyond access to goods and services, was Ozersk – or any other closed city in the former Soviet Union, different from other Soviet cities or American planned communities? "Closed" cities proliferated during the Cold War. Many if not most of them were connected with the military-industrial complex, for example Krasnoiarsk-26, Obninsk, Pushchino, Dubna, and Cheliabinsk-40 (now Ozersk). The government created an official designation for these military, industrial, secret, and otherwise "closed" cities, the "Closed Administrative-Territorial Formation (ZATO in its Russian acronym). Many of the cities never appeared on maps; many were known only as a post office box number. The people who lived and worked in these cities needed special passes to enter and leave, as Brown notes. But these cities were not, strictly speaking, a postwar phenomenon, but date to the first-five year plan and the re-introduction of the Tsarist system of internal passports, tied to the Soviet practices of ubiquitous ID cards and labor books, and to the propiska system required of any resident of any city.

Investigation of the role of the gulag in any of these cities indicates that they were similar in many ways across the empire because gulag camps served first and foremost construction ends. In each one, each morning columns of poorly-fed and -dressed prisoners marched to labor sites and at each evening they marched back to barracks. The role of the gulag in "special objects" and closed cities dates to the construction of the White Sea-Baltic Canal and subsequently to hydraulic installations and factories everywhere. As Brown notes, several of the directors of early projects were promoted to directorship of nuclear facilities. Ozersk was no different from the others, for example, Molotovsk (now Severodvinsk) on the White Sea, where similar joys, pride, and sorrows plagued the residents.

Brown acts with occasional surprise at the difficulties in the building of Ozersk even though nuclear weapons were a national priority and even though Secret Police Chief Lavrenty Beria was in charge of the project and requisitioned slave labor for it. But all of the USSR was a priority project or a campaign or a socialist obligation, and rarely did any project, even in the priority area of the military, finish on time, let alone have the right mix of labor, capital, and other inputs. Local and regional party secretaries, military leaders, ministerial officials and national leaders competed for resources across the nation geographically and between sectors of the economy. I have not encountered evidence of any city whose construction was completed on time, nor any city where housing, stores, hospitals, or schools were built to meet the needs of the workers and their families until after production was on line. The Soviet economic system was, ultimately, known for its poverty and tautness. So it should be no surprise that Ozersk, as Brown notes, was no Richland, that there was no master plan to build it, and that workers in the US plutopia, Richmond, benefited from the general abundance in the US economy.

A third point. One of Brown's provocative findings is that military leaders in both countries turned to the family as a source of stability in the burgeoning weapons cities. There was a danger that labor turnover would slow production and permit

secrets about weaponry to get out. In the first months and years it was difficult for managers to find workers to toil in miserable conditions. In Ozersk they used slave laborers, including German POWs, both risky from the point of view of secrecy and production. Eventually, leaders turned to the nuclear family as the basis of stability. Brown fails to note here that Stalin had already chosen the nuclear family as the unit of stability in the USSR in the 1930s during the horrible and murderous dislocations of industrialization, collectivization and urbanization. It is therefore not surprising that Stalin and Beria sought ultimately to offer a comfortable life, cottages to the elites, apartments to the others, and well-stocked stores to keep Ozersk residents content and hard working.

Last, I would have liked to see more direct discussion of the reasons for the similarities in the plutonium utopias of the USSR and the US. One could make a technologically determinist argument that technology is self-augmenting, almost autonomous, and requires the building of similar structures, institutions and approaches. If the USSR and US were otherwise so different (capitalist vs. socialist, democratic vs. authoritarian, and so on), why did plutonium cities turn out to be so similar?

How should we deal with the nuclear legacy of extensive and haphazard waste and of classified information about the health of long-term residents? I have long believed that any time government officials claim the need for secrecy in the name of national security, then citizens must mobilize to open those secrets to scrutiny. We usually discover not security issues – even during the Cold War – but a cover-up or disaster or illegal and immoral practices. We will never know how many American and Soviet citizens were exposed to what levels of ionizing radiation for how long. Only during the Clinton presidency did the Department of Energy begin to address the possibility of compensation for those individuals, and briefly under President Yeltsin, too, Russia made some attempt to provide miserly payments. But in both cases “national security” considerations prevented a full reckoning. *Plutopia* reveals the dangers of secrecy full on as both Soviet and American lied about safety risks, white-washed or classified damaging studies, prevented studies even from going forward, and willingly endangered the lives of residents who devotedly labored for them during the Cold War. Some American officials will claim that the damage wrought by plutonium in the US is less than that in Russia, but that is no consolation even if true for those who suffered and lost loved ones.

Plutopia is a wonderful book, not the least for giving voice to those people, the workers, who have been excluded from official histories. I shall be thrilled to use it in courses and to discuss it with my Russian colleagues.

Comments by Kristen Iversen, University of Cincinnati

There are many aspects of the Cold War that have yet to come to light. The full cost of the war in human and environmental terms, in the U.S. and the former Soviet Union, is still under debate, and it is in books like Kate Brown's *Plutopia* that we can begin to understand how the inevitable accidents and hidden tragedies affected these two countries almost in perfect tandem. By chronicling the U.S. plutonium production Hanford and the linked city Richland with the Russian sister-facility of Maiak and Ozersk, Brown follows a drama of human folly and recklessness that might be almost comical at times if it weren't so devastating. With a half-life of 24,100 years, plutonium plays for keeps, leaving a lasting legacy on an international stage.

Plutopia peers behind the veil of Cold War secrecy and seeks to unmask the government and corporate negligence and maladministration that affected workers and residents in both countries. Like the Cold War itself, however (to borrow a popular phrase)—it's complicated. Greed, ineptitude, imprudence, and ignorance muddy the lines between right and wrong, integrity and profit, and the book tellingly reveals how the people most immediately affected by Cold War policy—those who lived and worked in Richland and Ozersk—were sometimes willingly complicit in the ecological and human damage caused by these plutonium plants.

This is an important and far-reaching book, but this particular aspect of the story interested me the most. It's a familiar story in the United States; one need only to look at the communities at or near Los Alamos, Oak Ridge, Rocky Flats, and others to see where people were willing to turn their heads and look the other way when faced with the unfortunate realities of plutonium production. Even when workers and local residents began to learn of the possibility or inevitability of health effects and environmental contamination, many chose to stay and enjoy the material comfort of living in what were essentially company towns with guaranteed comforts and benefits, even when they had other viable options. In the face of rising statistics regarding the effects of plutonium contamination on the human body and in the air, water, and soil, the phrase "within permissible limits" carried a deadly weight. But few people questioned what those limits were, who established them, how they were established, or if they were appropriate or even accurate. Plutonium can't be seen, felt, or tasted. When the poison is invisible, perhaps it's best to ignore it, especially when a good job is at stake. Brown notes a citizen's comment, "I just flow with the glow. LOL!" (p. 281). This was a common sentiment in my neighborhood and even in my own family when people were faced with the fact that we had grown up in the radioactive shadow of a secret nuclear weapons plant. "Rocky Flats is why we all have such glowing personalities!" was a common joke. Brown does a remarkable job of helping us understand how these economically strapped communities welcomed the military-industrial complex and felt a strong loyalty to the government-subsidized private corporations that operated these facilities. She raises significant and ongoing questions about a government's responsibility to

inform its own citizens when it is putting their lives or their properties at risk, particularly in a democracy, and provides a dark look into how the human heart sometimes responds when faced with the moral and ethical questions of bomb-making and radioactive and toxic pollution.

The research and reporting in this book is quite thorough, but its relatively limited focus on these two facilities prevents the author from examining how Hanford and Maiak were part of a much larger nuclear weapons system, particularly in the U.S., and how these historical problems create a clear and devastating linkage to current nuclear issues. I wondered why the author stopped short of discussing some of the legal structures that allowed the U.S. government to operate in such flagrant violation of civic responsibility and eventual environmental regulation, such as the Price-Anderson Nuclear Industries Indemnity Act. Enacted in 1957, this act partially indemnifies the nuclear industry against liability claims that might rise from nuclear incidents or accidents. That indemnity continues to the present day. Of further concern is the so-called "naturalizing" of radioactive and toxic disaster area and how governments are turning former nuclear weapons sites into "National Wildlife Refuges" (p. 333). Brown notes that this is occurring at Hanford, Maiak, and Chernobyl, yet it is also happening at the Rocky Flats site in Colorado and other sites around the U.S., particularly those associated with the Manhattan Project. Hanford, Maiak, and Chernobyl are, as Brown notes, sites of "ecological calamity," with destroyed habitat and deformities in animals, but there are other similar sites around the United States. These compromised and still-dangerous sites are now open for visitors or scheduled to open soon, and they appear beautiful and pristine. Few people are aware of the risk. This is a very current and urgent issue.

Nothing is as heartbreaking in this book as those whose lives were profoundly and unexpectedly affected by these plants, as in the "relocation" of the residents of nine villages on the Upper Techa, or the town of Nadyrev Most, where people simply disappeared. Although not quite as dramatic, we faced similar situations in the U.S. with the "downwinders" in Utah and Nevada, as well as residents living near Rocky Flats, Oak Ridge, and the Savannah River site. Many workers at Rocky Flats, for example, who were somewhat aware of what the plant was producing and the extreme danger of working with plutonium, proudly called themselves "Cold War Warriors." Residents living within ten miles of the plant were "Cold War Warriors" too—they just didn't know it, and they paid the price in terms of increased cancer risk and other illnesses. I would have liked to see the author briefly expand upon the connective tissue that ties all these stories together, and emphasize the urgency of the topic in terms of today's nuclear weapons policies.

In terms of style, Brown occasionally inserts herself into the narrative as a character on the page and creates an agreeable sense of intimacy that one doesn't necessarily expect in a book of this scope. This strategy adds a humanistic touch and helps balance a very dark and difficult topic. However, such authorial intrusion sometimes feels uneven or forced, as it does in the moment when Brown shares a bowl of huckleberries on the Wanapam reservation (page 35). I don't mind knowing the

author is sitting at the table with those she is interviewing, or even getting a peek into some of the personal and cultural challenges she faced, yet I would have liked to see this narrative technique woven more smoothly into the book as a whole.

In sum, this book adds a vibrant, necessary, and key analysis of the hidden history of these facilities and the some of the ongoing effects of Cold War politics. Brown offers a clear and intelligent perspective that is sorely lacking in contemporary debate about nuclear weapons and nuclear power.

Comments by Jacob Darwin Hamblin, Oregon State University

Few places encapsulate the concept of the Faustian bargain more than the plutonium-production facilities created in the context of war, and then cold war, in the 1940s. The government facilities at Hanford and Mayak were sources of pride, prestige, and military strength. Yet they also were places of widespread contamination, secrecy, discrimination, and government cover-ups. The fission products themselves are tied to human experimentation, birth defects, cancer, and the most expensive and unsolved waste problem in history. It's a troubled legacy to say the least. While much of the history of these sites in the United States and Russia is already known, including their dubious distinction as two of the most contaminated places on the planet, few have attempted to understand them together—as two sides of the same coin.

By treating the sites together in her award-winning book, *Plutopia*, Kate Brown requires readers to take a leap of faith with her, to overlook the vast cultural and political differences between these two places, to be willing to see a common story. It is a leap worth taking, because thinking through these two sites despite their differences charts a new path to understanding how such places have existed in the past and may exist again. The book would have been sufficient had Brown merely shown parallel cases of environmental degradation or health harm. But she goes further, developing an ambitious argument about the people who lived and worked in the near vicinities of the plutonium facilities, especially the cities of Richland, Ozersk, and surrounding areas. Through archival research and her own interviews with residents, Brown shows how governments turned the plutonium towns of Richland and Ozersk into islands of relative affluence ("plutopias"), rewarding workers with the trappings of middle class life while falling short in protecting their health.

The common denominator, for Brown, is the ascendancy of consumerism in enticing and placating people whose waters and airs were contaminated, and whose bodies were violated. Brown notes that achieving and maintaining a middle class life with good schools, nice cars, and full shelves overshadowed concerns about health and environmental degradation. She shows how in Richland the US government and the corporate contractors such as DuPont and General Electric put more resources into amenities and consumption than they did into protecting people's health. She observes a similar tradeoff in Ozersk, as the people there enjoyed far better conditions than in the rest of the Soviet Union and rarely faced the same austerity as other cities. To Brown, the ability to acquire a comfortable, middle class life trumped higher ideological goals. In the United States, freedom came to mean consumption; in the Soviet Union, the "embourgeoisement of plutopia" masked the abandonment of truly socialist goals (260). Meanwhile birth defects were on the rise, rivers were polluted, and human health suffered neglect.

Perhaps the ambiguity is intentional, but one might come away from reading *Plutopia* confused about who was responsible for this tragic tradeoff. On the one hand, it seems clear that governments often played down dangers, and Brown's narrative appears to focus on manipulation and deception. On the other hand, the people who lived in such "plutopias," often were the ones to willfully ignore dangers. Brown's narrative appears to suggest they chose to gamble their health in exchange for material well-being. Brown points to many cases of government neglect (or worse, experimentation), suggesting something pretty sinister. Yet she also conveys in heart-wrenching detail how many of the people who lived in those places also defended their worlds. Ironically, they were the least likely to welcome inquiries about public health or environmental degradation. At Hanford, whistleblowers were treated as "moles," and environmentalists who came to investigate were perceived as the enemy. Despite revelations of accidents, or of overexposure, the people of Richland were often extremely protective of the plutonium facility because it was the backbone of their lives. They panicked when the AEC began to shut down operations, and some rejoiced to discover that the contamination and subsequent environmental mitigation could become a cash cow of its own. I was reminded of Gretchen Heefner's book *The Missile Next Door*, which tracked similar stories of communities near nuclear missile bases—populated by residents who saw themselves as freedom-loving patriots but were really just fiercely protective of their subsidized livelihoods.[1]

At other times, it seems that governments were manipulating the people, playing down dangers. Confronted with scientific challenges about harm to health and the environment, atomic energy establishments developed public relations strategies to protect existing claims, or to deride others as naïve because they were new to the game. I wondered how much of this was really about defending one's expertise against outside interlocutors, a dynamic that certainly marks much of the AEC's history. Brown's discussion of how Hanford scientists played down the dangers in the Columbia River seem to bear this out. Sometimes it seems as if the confident proclamations of government officials had less to do with willful deception and more to do with compartmentalization. If officials took responsibility, they did so only for their plant, their factory, their village, their state, or their zone.

Plutopia is heavy on the stories of individuals' experiences. It is a rewarding read for anyone wanting to understand how the nuclear age affected real people. It also is based in part on interviews, which are presented in fascinating detail. Brown jumps back and forth between conventional third-person narrative and first-person retelling of her own research experiences. There are good reasons for this style; much of Brown's perspective comes from her personal interactions. For example, she had a hard time accepting food from the people she interviewed, which opened her eyes to how they experience outsiders. She also implicates herself as a disaster tourist, providing much-needed money to people she interviewed. Such nuances

[1] Gretchen Heefner, *The Missile Next Door: The Minuteman in the American Heartland* (Cambridge: Harvard University Press, 2012).

enrich the tale. It was problematic for me at times because I did not always notice the transition between the real historical people and the pseudonyms she used for some people she interviewed. So anyone using the book for teaching or research will need to take care that they are not taking in a pseudonym inadvertently.

The interviews are just one example of how Brown succeeds at taking us "beyond the zone," to borrow a phrase from one chapter, to tell the story of people who have been ignored for decades. That focus on individual voices leads me to ask Brown to comment on how she made her narrative choices when confronted with discrepancies. She does remind readers that she is acutely aware of the problems relying on oral histories or the memories of those she interviewed. I especially liked her description of Ozersk resident Galina Petruva (a pseudonym) as "what appeared to be the classic unreliable narrator." And yet Brown does, understandably, make choices about who to believe, and it might useful to learn about how she went about putting these perspectives into her narrative.

Brown's handling of one particular episode made me take a step back and wonder how much her narrative style was directing my understanding of historical events. I did not understand how taking a position on the actual character of the 1957 explosion in Kyshtym helped her argument. That explosion received widespread attention in part because of the efforts of Zhores Medvedev, who wrote about it in *Nuclear Disaster in the Urals*. [2] Some claimed it was a fission explosion, while others insist on it being a chemical explosion. As a side note, a "mere" chemical explosion would not rob the event of its disastrous character, because it would have spread radiological poisons all over the landscape. But when reading Brown's chapter on "The Kyshtym Belch," she writes as if it was a nuclear explosion. Indeed she notes in her lively style that "the bartenders continued to pour mugs of beer, right through a megaton nuclear explosion." As Brown knows, a megaton explosion would have been some fifty times the size of the bomb that destroyed Hiroshima. Is this a case of stylistic license? Or does the megaton figure come from somewhere? The footnote for the passage mentions that Russian officials continue to say it was chemical, but one of her contacts argues it was nuclear. What made her choose to craft her narrative so firmly as a nuclear—or even more specifically, a megaton-sized—explosion? She further commits to the nuclear explosion by noting how the column of smoke took on "that distinct mushroom shape." It would be useful to know who described seeing this shape. She later refers to it as "an accidental explosion the size of Hiroshima." Some kind of acknowledgment of the uncertainty, or the range of possibilities, seems warranted. The key points of this section of the book do not depend on her taking a stand on the nature, or scale, of the explosion, so I wondered why Brown felt compelled to do it.

What I found really powerful in Brown's discussion of the Kyshtym explosion was her treatment of those who cleaned up. They were not facility employees, but instead were soldiers and prisoners. By using such people, the nuclear facility itself

[2] Zhores A. Medvedev, *Nuclear Disaster in the Urals* (New York: Norton, 1979).

did not have to own up to any casualties among its own workers (another case of compartmentalization). In this way, plant operators could claim a strong safety record for its workers while presiding over one of the worst nuclear disasters ever, with a whole region as suffering witnesses and victims. It made harm invisible not only to the public, but to subsequent generations of historians trying to assess past practices. It's the same tactic used by the United States in not counting Navajo uranium mines as part of the nuclear fuel cycle, by the French in not counting their mines in Madagascar because they weren't on French territory, or the US and Europeans not counting cumulative doses to seamen who handled radioactive waste drums on privately-licensed dumping operations. It was painful to watch precisely the same practice occur in the Fukushima cleanup in 2011.[3]

Because much of my own work has included the British side of the story, I found myself wondering if Brown ever considered incorporating the story of Windscale (later Sellafield) as another "Plutopia." This is not meant as criticism—it would have been a different book, and of course longer!—but I wonder if Brown has gathered thoughts on parallels and differences on which she might elaborate briefly. After all, Britain too has a Cold War story, rooted in secrecy, and was guilty of many of the wartime exigencies that warped into postwar patterns. The UK's Atomic Energy Authority created the Windscale facility near Seascale, in Cumbria, to make plutonium. I wonder if a similar pattern of middle-class consumerism trumping health concerns pertained there. Its history was different in many ways (instead of releasing effluent into rivers, for example, it piped much of its radioactive effluent offshore, into the Irish Sea, from whence many radionuclides would return to human bodies in the form of edible seaweed). It makes an interesting foil to the Kyshtym story, because Windscale's most serious disaster (the Windscale fire and subsequent milk scare) occurred less than two weeks after the Soviet explosion. At that time the British, like the Americans, were still trying to figure out what had happened at Kyshtym, while trying to assess damage at home—and control public relations.

Plutopia is original in approach and completely absorbing, filled with stories of real people living in the shadow of the deadliest arsenals. At the close of the book, Brown ends with an upbeat paragraph about the courageous people she interviewed, calling them nuclear pioneers on the march, demanding biological rights. Although I appreciate this note of hope rather than despair, after reading *Plutopia* I came away with an entirely different impression of this history. It represents a time of callous tradeoffs based on false promises, manipulation of people's hopes and aspirations, willful blindness, or gross abuses of trust. I wish I could say that those times are behind us, but I am not sure I believe it.

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[3] Gabrielle Hecht, *Being Nuclear: Africans and the Global Uranium Trade* (Cambridge: MIT Press, 2012); Jacob Darwin Hamblin, *Poison in the Well: Radioactive Waste in the Oceans at the Dawn of the Nuclear Age* (New Brunswick: Rutgers University Press, 2008); Gabrielle Hecht, "Nuclear Nomads: A Look at the Subcontracted Heroes," *Bulletin of the Atomic Scientists* (9 Jan 2012), http://thebulletin.org/nuclear-nomads-look-subcontracted-heroes. Accessed Aug 21, 2014.

Response by Kate Brown, University of Maryland, Baltimore County

It is a testimony to the H-Environment forum editors to have put together a trio of reviewers who so astutely cover the range of *Plutopia*. Paul Josephson and Karen Iversen have expertise in narrating histories of Russian and American nuclear communities. Jacob Hamblin knows the big Cold War weapons picture. I am grateful to these three reviewers for the care and thoughtfulness in which they approached *Plutopia*.

All three reviewers ask questions about why I framed *Plutopia* as I did and not more broadly in Soviet, American or transnational contexts. Iversen wondered why I did not cover other nuclear sites in the U.S. Hamblin asked if I thought comparatively about the British Windscale accident, which occurred at the same time as the large Soviet "Kyshtym" explosion. And Josephson wanted to know about the larger Soviet context of closed and regime zone cities. To explain the framing of *Plutopia*, it might help to describe how I came to write it.

In 2004, I took a trip to the Chernobyl Zone and wrote an article about it. After that, the Oxford University Press editor, Susan Ferber, got in touch and asked if I would write a book on Chernobyl as a pivotal moment in history for an Oxford series with the same name. I wasn't much interested. I had gone to Chernobyl looking, not for radiation, but for a giant time capsule preserved in 1986 when 50,000 residents abandoned their shiny, clean and comfortable atomic city of Pripiat. I wanted to know if Soviet citizens in 1986 had an inkling that their empire was about to crumble. I thought I might answer that question by sifting through diaries, photo albums and letters left behind. Arriving in Pripiat, I realized to my chagrin that looters had picked the city clean of both valuables and artifacts. So I was preparing to move on to another topic when Susan called. I looked into it and realized that the world's first two plutonium factories—Hanford and Maiak—had each spilled at least twice as much radiation as Chernobyl. I thought that was interesting and wondered why the public knew so little about Hanford and Maiak, while Chernobyl was a household word.

Trained as a Soviet historian, I could have just selected Maiak as my subject. That would have been natural, but Hanford was the first plutonium plant and was clearly Maiak's covert inspiration. Historians like to start at origins and that meant Hanford before Maiak. I also realized that both plants had spawned exclusive, specially-built and subsidized cities to house plant operators. I puzzled over that. These were not small bomb labs, but large factories employing over four decades tens of thousands of workers. The plutonium disasters, which involved the spillage of at least 200 million curies into the surrounding environment, occurred most often not in the form of accidents, but as part of the daily operating order. Engineers designed environmental catastrophe into their blueprints and operating protocols. This meant that tens of thousands of American and Soviet workers witnessed and took part in the contamination of their homes, their bodies and those of their families.

And no one, over four decades, said anything about it, at least not on the record. For me, that was a chilling realization. And so, at some point, I stopped seeing Maiak and Hanford as two distinct entities in two very different countries. The great fact of the rushed, harried impulse to produce more and more entirely superfluous plutonium and dispense the vast volume of radioactive waste away, out of range of the factories brought these two places together for me, placing them in tandem in my sight, the two sets of practices, documents, and languages blurring together. I did eventually discern differences, but largely ones that were best grasped when the two histories were juxtaposed.

As I wrote, I set out to describe through the framework of plutopia how the military-industrial complex transformed the physical and social landscape of the USSR and USA not just near military installations, but more broadly. I especially directed this story at American readers who often take the extreme compartmentalization of the landscape as natural or a given. The segregated (all-white, heterosexual) postwar suburb financed with federal subsidies created a mentality of entitlement and privilege alongside a story of merit ("a few good men") that spread far beyond nuclear installations in the postwar decades. Many Americans endorsed and implicitly condoned the contamination, impoverishment and abandonment of their neighbors' communities while they fiercely defend the property values and safety of their own. That is one of the reasons, I argue, we are all citizens of plutopia. As far as other nuclear communities in the U.S. go, I could have listed many, many more than are generally recognized, and new ones crop up each year. The Atomic Energy Commission, for example, funded a machine shop for threading reactor fuel slugs in Oxford, Ohio. It was merely a warehouse and later just a small superfund site, and it carries over today into a diminutive cancer shadow. In October 2014, Sharon Lerner published a story in *The Nation* of a recently built community in Florida where brain cancer shot up 550 percent. The new development's neighbors were military defense contractors producing and leaching into the swampy terrain radioactive and chemical by-products. Neighbors have been barred from learning more about the waste products in their midst in the name of national security.[4]

Iversen wishes I had scoped out and reflected on the other communities built by nuclear weapons in the United States. I felt, however, that to generalize the specific story of Ozersk and Richland to those of communities across the United States and Russia would be to minimize those stories and make the book feel like a work of anti-nuclear advocacy, which I did not intend for it to be. Iversen's story of Rocky Flats is wonderful for its particularities, nuance, personal approach, and telling detail. Shiloh Krupar, as well, has written a playful, quixotic and deadly serious book on the transformation of DOE superfund sites into nature reserves.[5] Barbara Rose Johnston and Holly M. Barker's, *Consequential Damages of Nuclear War* about the

[4] Sharon Lerner, "The Brain Cancer Rate for Girls in This Town Shot Up 550%—Is a Defense Contractor to Blame?," *The Nation*, October 14, 2014.
[5] Shiloh R. Krupar, *Hot Spotter's Report: Military Fables of Toxic Waste* (Minneapolis: University of Minnesota Press, 2013).

survivors of Rongelap and Gretchen Heefner's *The Missile Next Door* on communities hosting nuclear missile silos in North Dakota describe local adaptations to nuclear installations. Josephson's examination of the intersections of the peaceful and martial *Red Atom* could be added to the list, as well as Hamblin's *Arming Mother Nature* for a look at multi-dimensional and encompassing features of the Cold War. A number of younger historians are currently writing histories of closed Soviet cities, and I look forward to their publication.[6] It is good to get these stories in their particular complexity, as we come to better understand this part of the twentieth century. The Cold War generated a technological-scientific-financial force that wolfed down whole segments of nations' intellectual and financial capacities and produced communities and lifestyles that now no longer appear to be rational, sustainable or healthy. We have a long way to go to understanding that history.

The British Windscale accident, which quickly followed the Kyshtym explosion, raises an interesting question, which was also broached by Josephson. He asked about technological determinism—do the two plutonium plants share similar societies because they share similar technologies? Windscale and Kyshtym occurred a little less than a decade after start up. In 1954-55, Hanford, also running by that time for a decade, had a bad spate of accidents, though smaller than Kyshtym and Windscale. These events show how precarious engineers and plant managers found running the plutonium plants, which because of the highly corrosive quality of radioactive isotopes working in concert with chemical toxins, aged rapidly, within just a few years of start up. Rubber stoppers and casings disintegrated, pipes with contaminated fluids sprang leaks, valves refused to open, pumps got clogged, and there were thousands of pipes and valves and pumps in these colossal plants to fall apart. Historians celebrate the ingenuity involved in masterminding the first plutonium plants. Workers, however, remember how much seat-of-the-pants creativity (courage and heroism) it took to keep them going.

Hamblin asks about motivations. Who is at fault? Residents of plutopia were willing, if not fully-informed, supporters of the degradation of their environment and health. They relinquished responsibility to managers and scientists who issued frequent, if increasingly doubted, reassurances. Hamblin suggests that in the U.S., part of the scientists' motivation was to defend their political interests from outside interlocutors. That is certainly true. AEC researchers rushed to refute and even smear outside scientists who raised questions about contamination and public health. But this wasn't just professional rivalry in an open scientific playing field. They used words like "danger" and "threat," not when talking about radioactive waste spreading around and beyond the plants, but when discussing groups of concerned citizens asking questions and financing their own small-scale studies.

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[6] Maria Rogacheva, "A History of a Town that Did Not Exist: The Soviet Scientific Intelligentsia in the Post-Stalinist Era," Ph D, University of Notre Dame. Evangelos Kotsioris is researching the history of the city of Zelenograd. Anna Veronika Wendland is working on a history of a Ukrainian atomic town, Rivne, and Xenia Vytuleva is examining the influence of the existence of closed cities and closed Gulag spaces in late Soviet dissident art.

They quickly jumped to isolate the work of scientists such as Alice Stewart and Ernest Sternglass, but they also turned on agency insiders such as John Gofman, Arthur Tamplin, and Thomas Mancuso who while on government salaries or contracts discovered troubling results indicating that people near nuclear installations were in harm's way. In the US, the open society presented for government scientists and officials a constant fear that the press and civil society would launch a discussion of the health effects of chronic exposure to low doses of radiation. This was far more than bureaucratic infighting and scientific boundary maintenance. It meant, ominously, that many institutional scientists could not broach open-ended scientific questions. It also meant that while the AEC increased its budget exponentially for scientific research, researchers did not ask questions related to long term exposures to low doses of radiation.

Soviet scientists, paradoxically, did ask those questions. They used exposed workers and exposed villagers on the Techa River as human subjects. They took blood samples, made environmental measurements, gave medical exams, and came up with the diagnosis of Chronic Radiation Syndrome (CRS), which found that people exposed to long term low doses often were crippled by a full body assault of isotopes on organs, microbes, and DNA so that they generally felt awful, many of them in an unpredictable variety of ways. Soviet scientists pursued the study of CRS until a few years after the Chernobyl accident. But in the post-Soviet states, in the arena of newly opened societies with what were for a time vibrant media cultures, the diagnosis and study of CRS disappeared. This case might inspire historians to start rethinking long held formulas about science and its relationship to civil freedoms and modern society.

Josephson points out that closed Soviet cities dated from the early 1930s. After the great famine in order to control hungry peasants storming Soviet cities, security officials instituted a system of ID cards, labor books and local registration to limit access to better-stocked Soviet cities. In the mid-thirties military installations also acquired regulations to physically isolate garrison cities with gulag-style fences and passes. But as with many Soviet laws and regulations, the passport system and the security regimes of military and Gulag zones left lots of room for individuals to maneuver. Gulag prisons often had no fences, and prisoners came and went continually and chaotically. Garrisons too were permeable. Soldiers and prisoners working at the Maiak plant regularly showed up in neighboring villages where they stole, drank, and brawled, terrifying mostly Bashkir and Tatar residents. Historians are just starting to understand the underground world of the many people on the lam from Soviet law or living beneath the registration system on the margins of large Soviet cities (the best places to hide out). But mostly what made Ozersk different from other 'regime zones,' such as the Gulag-built Belamor Canal, was money and vigilance. The Soviet atom bomb program had priority production status in upper case letters and that entailed streamlined access to goods and services outside Gosplan budgets and infrastructure. So, yes, managers at the Maiak construction site fell behind schedule and suffered a shortage of building materials and workers, as they did elsewhere in the USSR, but, DuPont managers at Hanford

had similar problems staying on schedule and overcoming perceived labor shortages, and I think that points to the complexity and hasty pace of plutonium plant construction. At the Maiak plant, in contrast to Gulag and military sites, security was taken seriously. It was not just something for regulations. Beria showed up personally to see that the fence and pass system was in place. He supplied enough funds to make a material base so that isolation was feasible. This difference is apparent in comparing Ozersk to Solovetskii Island, the first Gulag camp city. The Gulag existed on the White Sea island from 1923 to 1939, but left behind a minimal architectural footprint. Gulag administrators built only a handful of log barracks, a few roads and a narrow gauge railroad. The fine stone buildings and churches, which the Gulag administration parasitically inhabited, were built by monks in the preceding centuries. Ozersk, in contrast, had, once the plant was up and running, access to funds and materials to build not just fences, gates and security lighting, but a fine Soviet city—one that became more and more common in the Soviet economic boom of the fifties and sixties. Ozersk and Obninsk, the Soviet Los Alamos, led the way in forging the limited-access, single-purpose Soviet cities that multiplied in the postwar decades.

Josephson is quite correct in pointing out the common quality of closed Soviet urban spaces. I was trying in *Plutopia* to underline the growing universalism of Ozersk and Richland on the Cold War, nuclearized landscape. Closed nuclear cities, regime cities, and passport regulations created patterns similar to the American generation of 'blighted' inner cities alongside segregated, white and straight suburbs. These spatial arrangements in both countries redistributed public wealth into the hands of chosen middle and working classes and also channeled aspiration and ambition in a way that did not disturb state ideologies that conversely (and perversely) promoted notions of equality and classlessness. Because of the apparent naturalness of spatial arrangements, people thought that it was their own idea to work really hard and do whatever the boss told them in order to move up to a hierarchy of chosen places, while leaving fellow citizens behind in blight and rural, provincial poverty.

On the family, Josephson points out that Stalin famously advocated, in the mid thirties, population growth in the wake of the great famine by banning abortion and granting women who bore ten children the status of "mother heroines." Stalin was promoting natalism, the reproduction of humans in order to serve the army and factories. It was babies he wanted. The family was much less on the radar. What was new about Ozersk was that grandmothers, aunts, and uncles were largely missing. Ozersk managers lovingly sponsored not typical, large extended Soviet families, but new, and at the time rare, nuclear families. Maintaining a family without an extended family in the Soviet forties was enormously difficult and made the nuclear family extremely dependent (as it did in the US) on state largess in the form of childcare, stocked stores, medical services, and recreational programs to cover harried parents working swing shifts. That was my point. Nuclear families in plutopia forged a major transformation in the way people interacted with and came to depend on the state.

Both Iversen and Hamblin ask questions related to narrative voice. Hamblin asks about style and literary license. He quotes a passage where I describe the Kyshtym explosion in 1959 as a "megaton explosion." That was indeed stylistic license, which I hope exists nowhere else in the book. I sought to acknowledge the debate about whether the explosion was chemical or the result of a chain reaction (which burped up from underground storage tanks, releasing 20 million curies of radioactive isotopes) but clearly the accident in no way neared larger metagon bombs tested later. Witnesses in memoirs and oral testimonies described seeing a mushroom cloud, but I took that to be creative re-imagining. However, Vladyslav Larin, a science reporter, whose father worked in Soviet nuclear weapons, told me that former plant workers and scientists who witnessed the explosion and studied it afterward believed the explosion to have been nuclear. I sided with Larin and his subjects. Hamblin asks about using pseudonyms, a common practice among anthropologists, but not among historians who rely on other historians being able to recreate and check their research. I use only one pseudonym in the book. She was an older woman who was nervous about retribution in her closed city for having spoken to me on the record. I set that person up as one of a few unreliable narrators in the text. The stories people told me were often so outrageous that at first I thought many people were exaggerating or were themselves slightly unhinged, until I started to find documentary evidence in the archives to support their stories. That is when I turned and included myself in the list of unreliable narrators in this history.

Iversen wants to know why I did not have a more consistent first-person voice in *Plutopia*. I pop up, and then go away for pages only to reappear again with no warning. I wrote this work in the genre of history, not memoir, even though it is not traditional to "insert oneself in one's history," as historians would put it. Perhaps that is why the form reads strangely for Iversen. I had few models for this kind of history writing, and partly for that reason I just finished a book called *Dispatches from Dystopia* to explore this narrative form.[7] I used the first person in *Plutopia* as a vehicle to show readers how I pieced together this story, and how imperfect that process was. I wanted readers to understand the limits of my ability to see into the past. I also sought to remind readers that in passages when I was imagining what happened based on my reading of documents, I was doing just that—imagining, not recounting an unmediated past. The first person also served as a vehicle to transmit my opinion of the events I was describing. I did not want to write in the narrative voice of the disinterested observer. That "objective" voice is as fictional as my intermittent first-person narrator. Neither the first nor the third person voice trumps the other in authenticity. Both are simply stylistic choices. I selected the first person because I had seen the damage created by the journalistic style of ostensibly providing both sides (as if there are only two) of a story. In the case of radiation, health and the environment, this journalistic mandate led to a narrative of confusion that most often ended in a convenient truce for the status quo. I felt that by using the first person I could convey my opinions as just that, as opinions to be weighed

[7] *Dispatches* will be published by University of Chicago Press in March 2015.

against those of others. I was gratified to read in one of the first reviews of *Plutopia* in *The New Scientist* that Rob Edwards found the history "partisan," but "entirely credible."[8]

[8] Rob Edwards, "The Radioactive Legacy of the Search for Plutopia," *The New Scientist,* 18 March 2013 (http://www.newscientist.com/blogs/culturelab/2013/03/plutopia.html).

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