# H-Diplo | Robert Jervis International Security Studies Forum

## Roundtable Review 15-36

Toshihiro Higuchi. *Political Fallout: Nuclear Weapons Testing and the Making of a Global Environmental Crisis.* Stanford: Stanford University Press, 2020. ISBN: 9780804785945.

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## Introduction by David Holloway, Stanford University

Toshihiro Higuchi's *Political Fallout: Nuclear Weapons Testing and the Making of a Global Environmental Crisis* has already been the subject of an H-Environment Roundtable Review (Vol. 11, no. 5, 2021). It is a testament to the interdisciplinary character of Higuchi's book that it is now the subject of an H-Diplo Roundtable Review. The Partial Test Ban Treaty (PTBT) of 1963, which prohibited nuclear weapon tests in the atmosphere, in outer space, and under water, has been widely discussed in studies of the US-Soviet nuclear rivalry and nuclear arms control. Higuchi's book presents the treaty in a wholly new light, as a response to the global environmental crisis created by nuclear weapon tests and the radioactive fallout those tests produced.

The treaty was negotiated by the three states that possessed nuclear weapons at the time—the United States, the Soviet Union, and the United Kingdom. It has been widely seen as the disappointing result of negotiations on a Comprehensive Test Ban, which the three states had failed to conclude because of their inability to agree on ways of monitoring a ban on underground tests. The PTBT did not stop nuclear weapon testing, but the release of radioactive fallout into the biosphere declined drastically after 1963. By treating the PTBT as an environmental as well as an arms control treaty, Higuchi greatly increases its significance and throws new light on the relationship between national security and the environment during the Cold War.

The narrative backbone of Higuchi's book is the redefinition of radioactive fallout from a harmless byproduct of nuclear explosions into an intolerable global hazard. In tracing this process, Higuchi draws on rich evidence from the United States, the Soviet Union, the United Kingdom, and Japan, as well as the United Nations. This is not the story of a battle between science and politics, but rather an elegant analysis of their interpenetration over time. Higuchi uses the term "the politics of risk" to refer to the "worldwide struggle to determine the biological effects, social responsibility, and policy implications of global radioactive contamination" (7). It is that struggle that is the subject of his book. Two of the reviewers point to the relevance of Higuchi's approach for exploring the global response to COVID-19.

The four reviewers are unanimous in praising *Political Fallout*. They each raise questions, which Higuchi addresses in his response.

Simo Laakkonen praises Higuchi's "remarkable work" in exploring the different types of research done on radioactive fallout by scientists in the United States, the Soviet Union, Great Britain, Japan, and the United Nations between 1945 and 1963. His comments deal mainly with a question Higuchi's book raises but does not answer: why has radioactive fallout not been recognized in all sectors of society as an environmental problem? Why is Rachel Carson's 1962 book *The Silent Spring* commonly regarded as the starting point for modern environmental awareness? One of the answers Laakkonen suggests is that the bomb produced such a wide range of socio-cultural effects that natural science alone cannot explain them. Complementary approaches, including popular culture, are needed to explain why and how atmospheric nuclear tests affected different actors and sectors differently in Western societies, and beyond the West as well.

Kurk Dorsey writes of Higuchi's "fascinating contributions to our understanding of environmental diplomacy." He does, however, raise two points that challenge Higuchi's approach. First, he takes issue with a comment Higuchi makes in the conclusion of his book that "the redefinition of radioactive fallout from a harmless phenomenon to an unacceptable hazard" was "neither a triumph of science over politics nor a political definition of science" (195). Dorsey writes that there is evidence for both in the book, and as an example of the triumph of science over politics he points to President Dwight Eisenhower's change of perspective on fallout following the discovery of "hot spots" across the United States. Second, he suggests that Higuchi should have addressed more directly the differences between the way in which the Soviet Union

and the United Sates approached the issues raised by radioactive fallout, implying there some of these differences were fundamental in ways that Higuchi's narrative fails to address.

Waqar Zaidi calls Higuchi's book "an important and significant contribution to the growing literature on the politics of nuclear weapons, and specifically fallout." Higuchi's most original contribution, in Zaidi's view, is "to point to the importance of the epistemic definitions and standards in relation to risk in shaping the politics of nuclear fallout." He does note, however, that the comparative framework sometimes falters, with the spread of scientific studies feeling unbalanced and conclusions drawn that apply mostly, or only, to the United States.

Elisabeth Roehrlich notes the innovative character of *Political Fallout*. It combines environmental history, the history of science, and diplomatic history to reframe the oft-told story of the PTBT. It puts the treaty in a new light, identifying it "not as a missed opportunity to stop the nuclear arms race" but as "one of the first international treaties concluded during the Cold War that directly addressed a truly global human-induced global environmental issue." Roehrlich raises three questions. First, given the emphasis on epistemology, what is Higuchi's view of the concept of "epistemic community," which he does not use? Second, it would be interesting to know more about the purposes behind the massive testing of nuclear weapons in the early Cold War. Third, there is little about the pop-cultural hype surrounding nuclear tests.

In his typically precise response to the reviewers, Toshihiro Higuchi addresses the main points they raise. He deals with the epistemological issue flagged by Dorsey by noting that because the health effects of globally dispersed fallout are uncertain, there is no clear boundary between scientific knowledge claims and political goals in this history. That is one of the reasons for not using the concept "epistemic community," as he explains in his reply to Roehrlich. Higuchi agrees that he could have devoted more attention to a comparison of the Soviet responses to the crisis with those of the US and UK, but it is the similarity and convergence between them that primarily interest him. He agrees with Laakkonen that a fresh examination of nuclear culture is called for but defends the focus of his book on science and policymaking. The reviewers' excellent comments and Higuchi's response bring out the elegant and innovative qualities of *Political Fallout*, and for this they deserve our thanks.

**Contributors:**

**Toshihiro Higuchi** is Associate Professor of History at Georgetown University. He studies the international history of the nuclear age with a focus on its scientific, technological, and environmental aspects. He also writes about the environmental history of modern Japan in the Pacific world. His book reviewed in this roundtable is a winner of the 2021 Michael H. Hunt Book Prize in International History awarded by the Society for Historians of American Foreign Relations (SHAFR). His recent works include "Hiroshima, Nagasaki, and the Environmental Age," in *Hiroshima and Peace Studies: From the First Atomic Bombing to the Treaty on the Prohibition of Nuclear Weapons*, ed. Yoshiaki Furuzawa, Yasuhiro Inoue, and Michael Gorman (Hiroshima: Keisuisha, 2023), 177-95, and (with Jacques E.C. Hymans) "Materialized Internationalism: How the IAEA Made the Vinca Dosimetry Experiment, and How the Experiment Made the IAEA," *Centaurus* 63, no. 2 (2021): 244-61. Currently, Higuchi is working on his next book project on the oceanic history of post-1945 American empire through the lens of nuclear marine propulsion.

**David Holloway** is the Raymond A. Spruance Professor in International History, Professor of Political Science, and Senior Fellow at the Freeman-Spogli Institute for International Studies, Emeritus at Stanford University. Born and raised in Ireland, he received his BA, MA, and PhD from the University of Cambridge. Before joining the Stanford faculty in 1986, he taught at the Universities of Lancaster and Edinburgh. He is

the author of various works including *The Soviet Union and the Arms Race* (Yale U.P., 1983) and *Stalin and the Bomb: the Soviet Union and Atomic Energy, 1939–1956* (Yale U.P., 1994).

**Kurk Dorsey** teaches US environmental history and US diplomatic history at the University of New Hampshire. He has published two books, *The Dawn of Conservation Diplomacy* (1998) and *Whales and Nations* (2013), both in the Weyerhaeuser Environmental Books series from the University of Washington Press.

**Simo Laakkonen** studied political history at the University of Helsinki and completed his MSc thesis in 1991 about the emergence of the new labor movement (CUT, PT) which gained political power in Brazil at the end of the twentieth century. He continued his studies in social and economic history and defended his PhD thesis in 2001. After that, he worked as a researcher of the Academy of Finland, a Lecturer of Environmental Policy at the Department of Environmental Studies in Helsinki and as an (acting) Professor of Environmental Policy at the University of Joensuu in Eastern Finland. He was also a Visiting Fellow at the University of Stockholm, and the University of Kansas. Currently he is director of the Degree Program in Digital Culture, Landscape and Cultural Heritage at the University of Turku, Finland.

**Elisabeth Roehrlich** is an Associate Professor in History at the University of Vienna, Austria. Her latest book, *Inspectors for Peace: A History of the International Atomic Energy Agency* (Johns Hopkins University Press, 2022) explores the evolution of the IAEA's dual mandate of nuclear technology promotion and control during the Cold War and after.

**Waqar Zaidi** is Associate Professor of History at the Lahore University of Management Sciences. He was recently a Member at the School of Social Science at the Institute for Advanced Study, Princeton, and Verville Fellow at the Smithsonian National Air and Space Museum, Washington, DC. His research focuses on twentieth-century technology and international relations, especially aviation and atomic energy. His first book, *Technological Internationalism and World Order: Aviation, Atomic Energy, and the Search for International Peace 1920–1950* (Cambridge: Cambridge University Press, 2021) was awarded the 2022 Turriano ICOHTEC Prize for best book in the history of technology. He is currently working on a history of US assistance for civil aviation in West Asia during the Cold War 1945–1965.

Review by Kurk Dorsey, University of New Hampshire

Older readers of this roundtable might recall a Peanuts cartoon from January 1958, shortly after radioactive debris from a nuclear test drifted over Los Angeles, in which Linus mistakes falling snowflakes for nuclear fallout. Before Charlie Brown successfully reassures him that everything is fine, Linus yells: "It's happening just like they said it would!!"[1] For a consistently apolitical comic, this strip was a remarkable attempt to find levity in a real-world crisis. It may say more about me than about Charles Schulz or society writ large that Toshihiro Higuchi's important new book reminded me of that cartoon, but it seems to be a useful reminder that not that long ago the threat of nuclear fallout was so prevalent that it worried even six-year-olds in cartoons.

Probably unintentionally, Linus captured key themes about the nature of fallout, and not just the pervasive fear of the mysterious substance. The humor came from Linus's inability to separate the mundane (snowflakes) from the sinister (fallout), which highlights one of Higuchi's central points, that so much was unknown about fallout that epistemic debates were central to policy making and public relations. Linus also made a point about the role of the public in both observing environmental conditions and also raising a hue and cry about the perils of human-released radiation. In the real world, some of the snow actually might have been irradiated and Charlie Brown ultimately might have been accused of being not just a blockhead but also a shill for the military-industrial complex.

In *Political Fallout*, Higuchi argues that the 1963 Partial Test Ban Treaty (PTBT), which was signed by Great Britain, the Soviet Union, and the United States, was both a failed attempt to control the nuclear arms race and a successful attempt to limit environmental damage from radioactive fallout. In particular, he focuses on the clause in the treaty's preamble that the signatories would "put an end to the contamination of man's environment by radioactive substances" (3). The treaty was an environmental success because it marked a global redefinition of fallout as too risky to tolerate, to the extent that even contemporary North Korea has been careful to emphasize that it has not released any fallout in its nuclear tests (196). But the very fact that North Korea is testing weapons proves that the goal of ending the nuclear arms race is not much closer to reality than it was in the 1950s, when a complete test ban was first proposed. Scientific uncertainty was central to debates about acceptable levels of risk, which Higuchi calls the politics of risk. Participants debated how much danger fallout really posed, who would be affected and on what time scales, and whether the risk of fallout outweighed the risk of being unprepared for nuclear war. The debates led to a compromise solution in the PTBT that ended atmospheric testing for its signatories but allowed them to keep blasting away underground (which of course was not without its own risks).

As Higuchi explains, the study of radiation was still in its infancy before the testing of nuclear weapons began, so scientists involved in the testing process made up the rules as they went along, often influenced by their own professional interests. In a book full of wonderful, chapter-opening hooks, three stand out to make the point. In the first, engineers at Kodak noticed in the fall of 1945 that some of their film had been spoiled before it could be shipped to consumers, but they discovered that, rather than the damage being an artefact of normal background radiation, the contamination had come from an isotope that was supposed to be only theoretical and certainly not blown from New Mexico to east of the Mississippi. The second recounts the arrival of irradiated tuna in Japan after the notorious *Lucky Dragon* incident of 1954, which set off an attempt to find and assess "atomic-bomb tuna," which turned out to be far more common and irradiated than US and Japanese safety officials anticipated. The third captures the moment when a scientist in California recognized

[1] https://www.gocomics.com/peanuts/1958/01/05, from 5 January 1958; accessed 11 January 2022.

that heavy rains coincided with a recent Soviet nuclear test and used his own Geiger counter to show that rainwater was more than 200 times more radioactive than the assumed safe level (16, 41, 136).

Higuchi uses archival documents from the USSR, Britain, Japan, the United States, Canada, and the United Nations to provide a broad perspective on the evolution of thinking about the risk from fallout. He situates that evidence at the intersection of the Cold War and the Anthropocene, the idea that humans have created a new epoch in human history, which is often defined as starting with the first atomic explosion in 1945.[2] The result of that evolution was "neither a triumph of science over politics nor a political distortion of science" (195), although a reader certainly could find evidence for both throughout the book. In fact, the most important part of Higuchi's book is the chapter on local efforts to understand fallout, which seems to show the triumph of science over politics, as it helped force even President Dwight Eisenhower to change his thinking about nuclear testing.

The United States started nuclear weapons testing in 1945 with the Trinity explosion in New Mexico, but the first Soviet test in 1949 in Kazakhstan set off the almost manic competition to test bigger and more powerful weapons. Higuchi might have illuminated the rationale for the scores of explosions that each nation set off (435 in the years before 1963), whether on Pacific islands or in Nevada for the United States, Kazakhstan or Novaya Zemlya for the Soviet Union, or Australia for the UK. Certainly part of the goal was to learn about new designs, whether fission or fusion, and new sizes, whether large and small. The huge American Castle Bravo test in 1954 (15 megatons) was later eclipsed by the Soviet Tsar Bomba test (50 megatons) in 1961, as the three nations, with France and China trailing behind, raced to build more intimidating weapons.[3] US, British, and Soviet leaders allowed concerns about national security to trump almost everything else in the first part of the Cold War, which made it easier to dismiss any fears about testing such weapons above ground. In particular, proponents of the national security state claimed, without much evidence, that the amount of radiation released from these blasts really was not significant compared to background radiation that everyone lived with anyway (a study in 1978 suggested that the natural exposure was at least 10 times as high as that from fallout).[4] Instead, they emphasized that safety could be ensured by keeping ordinary citizens below a threshold level of exposure.

But by the middle of the 1950s, concern about radioactive contamination of food, especially in Japan and the United States, started to erode the prerogatives of that national security state. As Higuchi demonstrates, faith in the threshold idea, which had been based largely on guesswork in any case, faded in the face of a new idea, the linear non-threshold (LNT) hypothesis. LNT posited that any exposure carried a risk of mutation to the germ cells of an individual. While the risk was small for any one person, for large numbers of people over the long stretches of time that it takes radioactive isotopes to decay the deaths and birth defects from any particular nuclear test might range into the tens of thousands. As that way of thinking gained a foothold, Higuchi argues, citizens in the Western democracies increasingly disagreed with their leaders about how to assess and balance the twin risks of Communist expansion and irradiated food. Under such pressure, the United States moved most of its testing underground in the late 1950s, and physicists on both sides of the Iron Curtain worked on so-called "clean bombs," (104, 128) which would emit far less radioactivity.

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[2] The starting point for any study of the Anthropocene should be J. R. McNeill and Peter Engelke, *The Great Acceleration: An Environmental History of the Anthropocene since 1945* (Cambridge, Mass.: Belknap Press, 2016).

[3] Two good sources on the history of weapons testing are David Blades and Joseph Siracusa, *A History of U.S. Nuclear Testing and its Influence on Nuclear Thought, 1945–1963* (New York: Rowman and Littlefield, 2014) and Richard Rhodes, *Dark Sun: The Making of the Hydrogen Bomb* (New York: Simon and Schuster, 1996).

[4] Ronnie Lipschutz, *Radioactive Waste: Politics, Technology, and Risk* (Cambridge, Mass.: Ballinger Publishing Company, 1980), 14.

But the national security state proponents were still persuasive. Higuchi argues that John F. Kennedy came into the presidency of the United States in January 1961 opposed to atmospheric testing, but he was unable or unwilling to halt such US tests because doing so might make the United States look weak to the Soviet Union. Like much of the world, Higuchi concludes, he was surprised when the Soviet Union announced that it would re-start atmospheric tests in April 1961, starting with the afore-mentioned Tsar Bomba. Without much internal pressure to respond to environmental concern, the Soviet leadership generally treated weapons testing as more of a display of power than their Western rivals. They first used support for an atmospheric test ban treaty to fend off US attempts to monitor their underground tests, then they justified atmospheric tests as necessary to keep ahead of aggressive Western powers, before finally swinging back to accepting the partial test ban with the US and Britain in 1963.

These swings suggest one area where *Political Fallout* might have missed an opportunity to address more directly the differences in the two blocs' approaches. When the Japanese discovered "atomic-bomb tuna," they buried the fish but not the story. When Lewis Strauss, President Eisenhower's atomic advisor, gave a speech suggesting that fallout was not a risk, Professor Alfred Sturtevant of Cal Tech publicly challenged him and therefore recalibrated the debate in the United States into an "epistemic stalemate" (61). And as chapter 6 demonstrates, local efforts to chart radioactivity in Wales and Minnesota broke that stalemate, opening the way for Eisenhower to drop his support for atmospheric testing near the end of his term. By contrast, decisionmaking about the environment in the Soviet Union was top-down and almost always set in a Cold War framework. To his credit, Higuchi touches on the historiography about scientific freedom across the Cold War divide in the introduction, when he joins the historians who see parallels in how the two superpowers treated science, as contrasted with the "traditional" view that the West allowed more freedom for its scientists (10). Oddly, the two works he cites as supporting the traditional view come from 2011 and 2018, while the two articles cited to support the idea of parallel tracks come from the same time frame, which at least raises a question of which approach is more traditional at this point.[5]

In a new take on a well-known tale about Soviet science, at various points Higuchi touches on how geneticist Trofim Lysenko had "a uniquely devastating impact" (71) on Soviet research on radiation, not because he made persuasive arguments but because he was able to crush or outmaneuver his detractors.[6] Even as scientists and military leaders inside the Soviet Union recognized how far behind the West they were in terms of research on genetics and radiation, the Soviet state defended Lysenko and his proponents. Eventually, Nikita Khrushchev, who succeeded Josef Stalin as premier of the Soviet Union, allowed Soviet geneticists more freedom in their work. The Soviet Union did in fact produce many great scientists, but the official Soviet contribution was often fraudulent, especially when engaged in international environmental negotiations. The evidence on Soviet whaling, for instance, shows a massive pattern of lying in a way that only hindered the working of the International Whaling Commission, even as Soviet scientists did some very

[5] Higuchi cites Mary Jo Nye, *Michael Polyani and His Generation: Origins of the Social Construction of Science* (Chicago: University of Chicago Press, 2011) and Audra J. Wolfe, *Freedom's Laboratory: The Cold War Struggle for the Soul of Science* (Baltimore: Johns Hopkins University Press, 2018) as examples of the traditional view on "the republic of science." The two articles cited to complicate that story are William DeJong-Lambert and Nikolai Krementsov, "On Labels and Issues: The Lysenko Controversy and the Cold War, *Journal of the History of Biology* 45, no. 3 (2012): 373-388; and Michael D. Gordin, "Lysenko Unemployed: Soviet Genetics After the Aftermath, *Isis*, 109, no. 1, (2018): 56-78.

[6] The starting point to understand Lysenko is David Joravsky, *The Lysenko Affair* (Chicago: University of Chicago Press, 1986).

important work on cetaceans broadly.[7] And if the topic is nuclear fallout, then Soviet attempts to hide the truth about Chernobyl must be discussed.[8]

Overall, Higuchi's fascinating contribution to our understanding of environmental diplomacy opens the door to other important questions. Once I got my mind off of comic strips, I could not help but think about the continued faith in the United States in nuclear power even after the risks of radioactivity had become a point of heated debate. The most pointed example concerns the various grandiose schemes cooked up under the larger tag of Project Plowshare, particularly the idea to use five nuclear explosions to blast a harbor in Western Alaska. More remarkable, though, was the willingness of at least some US officials to blow up pieces of other countries to create a new canal in Colombia, a new harbor in Australia, or a hydro-electric site in Egypt, with very little concern about the radioactivity inherent in even an underground explosion. At the same time, the domestic US power industry took on a two-decade fascination with nuclear power that slammed to a halt only with the Three Mile Island accident in 1979, which itself raised questions about the risk inherent in released radioactivity.[9] And on top of that, the world had generated an enormous quantity of nuclear waste without any long-term solution for its disposal. According to one source, by 1980 140 million tons of uranium mill tailings and 10 million cubic feet of radioactive liquids could be found just in the United States.[10] Higuchi's book may force a rethinking of these events.

Perhaps more important are the insights that we might draw from Higuchi's discussion of the politics of risk in a time of scientific uncertainty, which might sound vaguely familiar as we enter the third year of the COVID-19 pandemic. The parallels are striking: scientists struggling to understand the nature of a new threat, prescriptions that shift as new information develops, politicians and national governments offering questionable solutions for a range reasons, and a public that takes matters into its own hands (ivermectin for all…). The political fallout of epistemic stalemates need not be radioactive.

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[7] Ryan Tucker Jones, *Red Leviathan: The Secret History of Soviet Whaling* (Chicago: University of Chicago Press, 2022).

[8] See for instance Serhii Plokhy, *Chernobyl: The History of a Nuclear Catastrophe* (New York: Basic Books, 2020) or Adam Higginbotham, *Midnight in Chernobyl: The Untold Story of the World's Greatest Nuclear Disaster* (New York: Simon and Schuster, 2020).

[9] Scott Kaufman, *Project Plowshare: The Peaceful Use of Nuclear Explosives in Cold War America* (Ithaca: Cornell University Press, 2012). Chapter 5 deals with the proposed Colombian canal, chapter 8 addresses the plan to blast a harbor in Australia and also mentions the idea for Egypt. On Three Mile Island, see J. Samuel Walker, *Three Mile Island: A Nuclear Crisis in Historical Perspective* (Berkeley: University of California Press, 2006).

[10] Lipschutz, *Radioactive Waste,* 1-2.

Review by Simo Laakkonen, University of Turku, Finland

Toshihiro Higuchi has done a remarkable work in tracking and exploring the types of biological studies on radioactive fallout that were done by various scientific institutions and other actors in the United States, Great Britain, Japan, the Soviet Union, and the United Nations from 1945 to 1963. Higuchi's book also shows convincingly that at least since the 1950s, radioactive fallout was discussed on the governmental and international level as an environmental problem that affected the wellbeing of humans and/or other beings in nature. This was also made clear in 5 August 1963 in the final text of the Partial Test Ban Treaty (PTBT), which stated that its aim was to protect both populations and "the environment" around the world.[1] Therefore it can be argued PTBT, formally known as the Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water, was without a doubt one of the very first global treaties of environmental protection that focused on pollution issues affecting both atmosphere, hydrosphere, lithosphere and biosphere.[2]

Higuchi follows with painstaking accuracy the development of various units of measure, complicated laboratory tests, and cryptic concepts of safety in an emerging new world order, which was based on the power of the nucleus of the atom. This world was truly shadowy, complex, and tormented with contrasting views, censored reports, blunt denials, and shut doors. In this world, the protectors of peoples' health turned out to protect something else. Higuchi does valuable work by leading readers to the cabinets of the seemingly neutral and objective scientists who served the masters of the atom or more precisely of the omnipotent nuclear weapon arsenals of the West.

With good reason, Higuchi asks why, despite all this pollution, public debate, and a pioneering global treaty, radioactive fallout has not been recognized in all sectors of the society as an environmental problem. Or more precisely, why do numerous scholars today still believe that modern environmental awareness started to develop only after 1962 when Rachel Carson's book *The Silent Spring* was published?[3] When the political lineages of these two issues—the over-a-decade long international debate concerning radioactive fallout and the only recently emerging discussion of the impacts of agricultural toxics—are compared, it may be a bit difficult to understand the rationality of the argument suggesting the year 1962 as the starting point for the development of modern environmental awareness. Consequently I address here this wider question that Higuchi's excellent study poses and propose some ideas about how to move on in future studies.

Higuchi has wisely focused his study on the scientific studies and political discussions of the risks of radioactive fallout. But indeed one should ask why radioactive fallout has not been recognized in all sectors of society as an environmental problem. This is an interesting question that Higuchi's book does not answer. In my view there are potentially three explanations for this. First, science was without a doubt a crucial actor in postwar socioenvironmental discussions but yet it was only one, and often conflicting, source of information among many others. Second, science and scientists have seldom been able to influence directly the views of

[1] United Nations, *Treaty Series*: *Treaties and international agreements registered or filed and recorded with the Secretariat of the United Nation*s (New York: United Nations), 1965, 43-99.
https://treaties.un.org/doc/Publication/UNTS/Volume%20480/v480.pdf

[2] See, for example, Ronald Mitchell, International environmental agreements: A survey of their features, formation, and effects. *Annual Review of Environment and Resources* 28 (2003), 429-61. Dr. Mitchell's website includes a comprehensive database listing over 700 multilateral agreements and over 1,000 bilateral agreements.

[3] See, for example, Mark H. Lytle, *The Gentle Subversive: Rachel Carson and the Rise of the Environmental Movement* (Oxford: Oxford University Press, 2004); Douglas Brinkley, *Silent Spring Revolution: John F. Kennedy, Rachel Carson, Lyndon Johnson, Richard Nixon, and the Great Environmental Awakening* (Harper, 2022).

large masses of people. Third, atomic bombs and later radioactive fallout caused such a wide range of socio-cultural effects that they cannot be explained with the help of natural science alone.

In order to understand the dimensions of the problem of knowledge concerning the damage caused by atomic weapons, we need to return to the point of no return, to August 1945. Rarely has the population of the Earth been as much astonished and bewildered as it was upon hearing the first news of the atomic bomb and its effects. The most difficult thing for people to comprehend is the destruction caused by the first atomic bombs: how was it possible that a single weapon could destroy an entire city in one moment? What was the impact of radiation on such a scale? What did a city struck by an atomic weapon look like?

The impact of atomic warfare on human beings, which is Higuchi's theme, was the main factor that authorities did not want people to see after August 1945. Consequently officials tried to suppress the circulation of information about atomic radiation and its effects. In fact, the first photographs of Japanese killed and injured in Hiroshima and Nagasaki were not published until 1952 in *Life* magazine.[4] And understandably official censorship was even tighter for documentary footage than for photographs.

In an essay entitled "Apocalyptic Urban Future: Atomic Cities and Cinema" my co-authors and I argue[5] that when the censors closed the doors on documentary footage, they unintentionally opened a cultural Pandora's box: the absence of actual footage of the atomic bombings lifted the lid on "apocalyptic imagination," as Jerome Shapiro defines this genre,[6] releasing the creative energies and profound anxieties of writers, artists, and filmmakers around the world. The result of this was a cinematic boom that produced hundreds of science fiction movies between 1948 and 1962 featuring alien invasions, giant irradiated monsters, and terrifying nuclear mutants, born from secret scientific experiments or atomic radiation.

We argue that these science fiction movies, where all Higuchi's main actors including radioactivity, testing, scientific, laboratories, and decision makers had a central role, transformed the disturbing realities of A-bombs and atmospheric atomic tests, which had long been hidden from the public, into chilling cinematic visions of urban devastation, disruption of the natural world, and post-apocalyptic survival. For example, in *Them!*, which was released in 1954, a television reporter who saw the armies of giant radiation-mutated ants emerging from the test sites in New Mexico, breathlessly declares that "Man as the dominant species of life on Earth will become extinct!"[7]

A key message of the increasing celluloid biodiversity of mutated flora and fauna was that no one knew, with certainty, the outcomes of Western techno-scientific progress. Questions and insecurities lingered and, after Hiroshima and Nagasaki, it was impossible to ignore catastrophic scenarios for humanity. If governmental laboratories had been able to develop in secrecy bombs that could wipe out an entire city or a country, then how sanguine could anyone be about the growth of the military-industrial complex or the fruits of scientific

[4] Paul Boyer, *By the Bomb's Early Light: American Thought and Culture at the Dawn of the Atomic Age* (Chapel Hill, NC: University of North Carolina, 1994), 8.

[5] Kimmo Ahonen, Simo Laakkonen, and William M. Tsutsui, "Apocalyptic Urban Future: Atomic Cities and Cinema," in Simo Laakkonen, J. R. McNeill, Richard P. Tucker, Timo Vuorisalo (Eds.), *The Resilient City in World War II: Urban Environmental Histories* (New York: Palgrave Macmillan, 2019), 259-280.

[6] See Jerome Shapiro, *Atomic Bomb Cinema: The Apocalyptic Imagination on Film* (New York: Routledge, 2002).

[7] Trailer, *Them!,* Warner Archive Collection, YouTube, https://www.youtube.com/watch?v=k4zuNuCxFZI

research that seemed even more outlandish than the fantasies on cinema screens? How might nature and natural forces be perverted as threats to human beings or indeed to planet Earth itself? [8]

Today we know that postwar science fiction filmmakers and their audiences may well have been justified in at least some of their darker suspicions. As Edmund Russell, James Fleming, Jacob Darwin Hamblin, and others have shown, the collaboration of the American military, scientists, and industry gradually extended the concept of total war into the natural world.[9] In retrospect, Hollywood studios were no match for the secret R&D laboratories of the new superpowers that World War II had created.

In brief, I argue that with all its violence—from concentration camps, genocide, and the firebombing of cities to the horror of atomic warfare—that global cataclysm led to the birth of a new kind of fear, fear of a man-made end to the world, an anthropogenic apocalypse. Since World War II, and especially since two days in early August 1945, environmental catastrophism has been part of our environmental awareness. In conclusion, if we take a wider look upon post-war decades, atomic weapons did not create environmental awareness only, but environmental catastrophism as well.[10]

This discussion is not meant to criticize Higuchi's excellent book. Rather it suggests complementary approaches that are needed in the future in order to explore how and why nuclear weapons and atmospheric tests affected in such a different way various sectors and actors in Western societies. Perhaps it is time to take a wider look at the societies in different countries in order to study which sectors considered atmospheric tests to be dangerous to human beings and the environment and which sectors did not do so. Potential answers for such question could be found if one starts to examine how and why some key institutions and movements were alarmed only when the impacts of agricultural toxics started to be discussed in 1962. Did the problem of radioactivity truly "fall out" of the political agenda of most nature protection movements for nearly two decades? Maybe the time is ripe to explore why "silent springs" seem to have prevailed from 1945 until 1962?

[8] For a pioneering study which places *Them!* and other postwar "creature features" in an environmental context, see William Tsutsui, "Looking Straight at *Them!* Understanding the Big Bug Movies of the 1950s," *Environmental History* 12, no. 2 (April 2007): 237-253

[9] See Edmund Russell, *War and Nature: Fighting Humans and Insects with Chemicals from World War I to Silent Spring* (New York, Cambridge University Press, 2001); James Fleming, *Fixing the Sky: The Checkered History of Weather and Climate Control* (New York: Columbia University Press, 2010); Jacob Darwin Hamblin, *Arming Mother Nature: The Birth of Catastrophic Environmentalism* (New York: Oxford University Press, 2013).

[10] See Simo Laakkonen, Richard Tucker, Timo Vuorisalo, "Conclusions: World War II and Its Shadows," in Laakkonen, Tucker, Vuorisalo, eds., *The Long Shadows: Toward a Global Environmental History of the Second World War* (Corvallis: Oregon State University Press, 2017), 324-326.

Review by Elisabeth Roehrlich, University of Vienna

In 2003, the Japanese artist Isao Hashimoto produced an impressive multimedia art piece that recapped all nuclear explosions that had been conducted around the globe from 1945 to 1998, a total of 2,053 detonations.[1] In the short video, each nuclear explosion is indicated on a world map with a blinking light and accompanied by a dark sound. Each second of the video represents one month of the 53 years covered. The video, which the Preparatory Commission for the Comprehensive Nuclear Test Ban Treaty Organization (CTBTO) uses to inform wider audiences about the importance of a complete nuclear test ban, is a stark reminder of the huge number of nuclear explosions that the earth experienced during the Cold War and after.

Toshihiru Higuchi's *Political Fallout* offers an innovative and highly readable analysis of the history of nuclear testing, from the United States' first nuclear detonation in New Mexico (the so-called "Trinity test") on 16 July 1945 to the tests of the early 1960s. As the sound and the visuals of Hashimoto's video demonstrate, this was a dramatic period in the history of the nuclear age. After a phase of frequent nuclear testing, American and Soviet leaders agreed on a test moratorium that lasted from November 1958 to September 1961. On 30 October 1961, the Soviet Union exploded the largest nuclear bomb in history, the Tsar Bomba. While the American-Soviet test moratorium lasted, France entered the club of nuclear weapons states by conducting a nuclear explosion in the Sahara Desert in Algeria in 1960.

Higuchi's title for the book—*Political Fallout*—aptly grasps the issue at stake. The author is not primarily interested in the engineering behind, or the logistics of, nuclear tests, but in the radioactive particles that these blasts carried into the atmosphere and that then spread around the globe, so-called "nuclear fallout." Yet, as Higuchi makes clear, nuclear fallout was also always "political fallout," as it sparked discussions between various actors in different countries and institutions on the hazards of nuclear testing. In the introduction he explains that "Instead of asking whether fallout was harmful in reality, I recast the dangers of fallout as a historical question, the understanding of which evolved over time" (7). Higuchi is particularly interested in the Partial Test Ban Treaty (PTBT) of 1963—a key multilateral treaty to limit nuclear weapons testing—of which he offers a new and thought-provoking interpretation. While the existing historical literature focuses primarily on the arms control context of the treaty or the debate in individual countries, Higuchi offers a broader perspective, both thematically and geographically. He shows that, rather than having been simply "a missed opportunity to stop the nuclear arms race," the PTBT "directly addressed a truly global, human-induced environmental issue" (2).[2]

Here Higuchi links his study to interdisciplinary research into the Anthropocene, a proposed geological epoch that is characterized by the significant and enduring human impact on the earth's ecosystems and climate that is caused notably by large-scale industries and nuclear testing.[3] According to Higuchi, the PTBT, which banned all nuclear weapons tests that were not underground, "proved far more effective in its environmental objective than that of arms control" (3). *Political Fallout* thus removes dust from a rather classic thematic field

[1] "1945–1998" by Isao Hashimoto, https://youtu.be/cjAqR1zICA0.

[2] On the history of the PTBT, see for instance: Benjamin P. Greene, *Eisenhower, Science Advice, and the Nuclear Test-ban Debate, 1945–1963* (Stanford: Stanford University Press, 2007); David M. Blades and Joseph Siracusa, *A History of US Nuclear Testing and Its Influence on Nuclear Thought, 1945–1963,* (Lanham, MD: Rowman and Littlefield, 2014); John R. Walker, *British Nuclear Weapons and the Test Ban, 1954–1973: Britain, the United States, Weapons Policies and Nuclear Testing. Tensions and Contradictions* (Farnam: Routledge, 2010).

[3] Colin N. Waters, James P. M. Syvitski, Agnieszka Gałuszka, Gary J. Hancock, Jan Zalasiewicz, Alejandro Cearreta, Jacques Grinevald, Catherine Jeandel, J. R. McNeill, Colin Summerhayes, and Anthony Barnosky, "Can Nuclear Weapons Fallout Mark the Beginning of the Anthropocene Epoch?" *Bulleting of the Atomic Scientists* 71:3 (2015): 46-57; DOI: 10.1177/0096340215581357.

of Cold War history by compellingly combining approaches and insights from environmental history, the history of science, and diplomatic history. The book is therefore neither just an environmental history that offers good diplomatic context, nor an international history that also looks into environmental history. Instead, Higuchi offers a study in which these different approaches are truly integrated. Rather than focusing on the nuclear arms race between the two superpowers, Higuchi follows the thoughts and works of various actors around the world, from local grassroots movements to international bodies such as the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), which was established in 1956, and with particular attention to female actors. His research is based on in-depth archival research in six countries.

The organization and composition of the book are superbly done. At the beginning of each of the seven chapters, Higuchi zooms in on a concrete story that powerfully captures the theme of the respective chapter. For instance, at the beginning of chapter 2, he takes his readers to the Tsukiji Fish Market in Tokyo, where fish were discovered to be radioactive after the American Castle Bravo nuclear tests in the Pacific in 1954, and which caused an "atomic-bomb tuna" scare (41). The way Higuchi's narrative links local with global events tells much about the history of nuclear testing, which, as becomes obvious in *Political Fallout*, is a global history. In the book's introduction, Higuchi writes himself into this history. He recalls how he read about the atomic bomb victims in Japan—the *hibakusha*—at school. Only during graduate school did he learn that radioactive particles of past nuclear explosions were still present around the world. He concludes, "I discovered that I, too, was *hibakusha*" (xi). Like the author, the actors dealt with in the book only slowly realized that nuclear weapons tests bore more than local risks in the immediate surroundings of the test sites and had global consequences.

An important and interesting subtopic of the book is how the distinction between technical, scientific, and political questions was managed, a distinction that was crucial for Cold War science but hard to make.[4] When UN Secretary-General Dag Hammarskjöld spoke at UNSCEAR's opening session, he expressed the hope that the committee's work would "help move the subject out of the area of emotional sensationalism and place it squarely on the solid footing of scientific knowledge" (109). This tendency to use science to downplay nuclear fears as nuclear hysteria can be found throughout the nuclear age. As with most matters of arms control, there was no such thing as a purely technical question in nuclear testing. The notion of a "maximum permissible dose" was used as a scientific justification for the political attempts to downplay the risks of nuclear testing (40). Higuchi's book also exposes the cultural bias in, and Eurocentrism of, the scientific debate on the contamination of food: it centered on milk rather than rice, the latter of which however turned out to be significantly more contaminated (120).

Three of the seven chapters' headings prominently feature the term "epistemic": they are entitled "Epistemic Stalemate," "Epistemic Divide," and "Epistemic Negotiations."[5] Given the impact of the concept of "epistemic communities" in the history of science, especially when it comes to the development of international institutions and law, it would have been interesting to read more on this concept as well as Higuchi's comments on whether he regards it as useful for his study.[6] In addition, reading Higuchi's thought-provoking history made me wonder whether it would have been helpful had the author also touched on other dimensions of nuclear tests. For instance, the readers of *Nuclear Fallout* do not learn much about the

[4] See, for instance, Audra Wolfe, *Freedom's Laboratory: The Cold War Struggle for the Soul of Science* (Baltimore: Johns Hopkins University Press, 2018).

[5] "Epistemic Stalemate: Genetics and the Creation of Scientific Committees, 1954–1955;" "Epistemic Divide: The U.S. and British Scientific Committees, 1955–1966," "Epistemic Negotiations: The United Nations Scientific Committee, 1956–1958."

[6] Peter Haas, "Epistemic Communities," *The Oxford Handbook of Environmental International Law*, edited by Daniel Bodansky, Jutta Brunnée, and Ellen Hey (Oxford: Oxford University Press, 2008), DOI: 10.1093/oxfordhb/9780199552153.013.0034.

technology of nuclear explosives or the different reasons that caused massive nuclear testing during the Cold War. How relevant were test detonations for the design and development of nuclear bombs and how much did nuclear tests matter as power demonstrations? There is historical and political science literature on these questions that could have been referenced.[7] There is also hardly any mention of the pop-cultural hype that surrounded nuclear tests in the 1950s, such as the "Miss Atomic Bomb" contests.

My two brief comments on what else I would have wanted to see in Higuchi's narrative are not, however, intended as a critique of the book. Rather, these comments demonstrate that the book touches on important topics and that it asks important questions that stimulate further debate. *Nuclear Fallout* is not only a must-read for everyone who is interested in the history of the nuclear age and the Cold War, but also for those who seek best practice examples of how to skillfully cross the disciplinary boundaries between international and global history, the history of science, and environmental history. Given the challenges of the Anthropocene and the vulnerability of the international nuclear order, we will need more of such insightful histories.

[7] See, for instance, Or Rabinowitz, *Bargaining on Nuclear Tests: Washington and Its Cold War Deals*, (Oxford: Oxford University Press, 2014).

Review by Waqar Zaidi, Lahore University of Management Sciences

Toshihiro Higuchi's *Political Fallout: Nuclear Weapons Testing and the Making of a Global Environmental Crisis* explores the politics of fallout (policymaking, international negotiations and diplomacy, and activism) in the US, Britain, Japan, and the Soviet Union between 1945 and 1963. It focuses in particular on the epistemics of fallout: what fallout was understood to be, how its risk was understood and quantified, how these understandings changed over time, and the nature of their impact on nuclear policymaking, activism, and public health concerns. The most significant narrative thread running through the book is the story of how fallout was transformed from being understood as a relatively harmless side effect of military activity to an unacceptable global hazard.

The book begins by exploring government attempts to management nuclear fallout between 1945 and 1952—that is prior to the detonation of the fusion bomb. The author argues that the earliest government reaction to fallout in Britain, the US, and the Soviet Union centered on programs to protect their populations from high doses of radiation in the event of nuclear war. As officials became aware of other types and sources of radioactive contamination, for example from testing or atomic bomb production, they dismissed them as harmless. This despite the fact that low-level radioactivity came to be increasingly monitored by the military because of its usefulness in indicating the presence of clandestine atomic activity by other countries.

To understand how nuclear fallout came to be seen as a public health hazard, the author turns to the explosion of concerns over food and water contamination in Japan in the early 1950s. As concerns over tainted fish increased following the irradiation of the Japanese fishing vessel *Lucky Dragon No. 5* in 1954, US officials responded by blaming the radiation protection standards in use for the inspection of tuna in Japan, and successfully pushed for lowered standards based on the concept of a "permissible dose" (55). Although this reduced public concerns in Japan, consternation in the US continued to grow, with scientists in particular continuing to study and sound the alarm over radioactive fallout from 1954 onwards.[1] Higuchi adds to our understanding of this growing alarm by focusing on US geneticists who fought to bring genetic risk to the attention of the public. An early and prominent intervention occurred at a meeting of the American Association for the Advancement of Science in 1954, where US geneticist Alfred H. Sturtevant suggested that the rate of radiation-induced mutations might be directly proportional to the dose received, with no dose threshold below which no mutations would occur. By doing so, Higuchi notes, Sturtevant took the risk horizon of exposure beyond the narrow local and regional confines understood by the US government and to a global and longer-term perspective.

In chapters 4 and 5, Higuchi explores officially government sanctioned scientific studies of fallout in the United States, Britain, and within the United Nations. Growing concerns over fallout led scientists (through for example the Federation of American Scientists) to call for the establishment of a United Nations commission to study radioactive fallout. Growing support amongst developing countries and the Soviet bloc forced Britain and the US to agree. The United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) was established in 1955. Meanwhile, in order to separate the issue of fallout from arms control, the British and US governments also commissioned national studies on fallout: by the National Academy of Sciences in the US and the Medical Research Council in Britain. Both organizations focused on Sr-90 as the most dangerous radioactive element in fallout, and further developed the concept of a genetically "permissible dose" for the general population. They disagreed, however, on cancer risks, with the British

[1] Lawrence S. Wittner, *Confronting the Bomb: A Short History of the World Nuclear Disarmament Movement* (Stanford, CA: Stanford University Press, 2009), 52-81; Elizabeth S. Watkins, "Radioactive Fallout and Emerging Environmentalism: Cold War Fears and Public Health Concerns, 1954–1963," in Garland E. Allen and Roy M. MacLeod, eds., *Science, History and Social Activism: A Tribute to Everett Mendelsohn* (Springer, 2001), 291-306.

Medical Research Council, which included a number of non-geneticist scientists working on radiation protection, adopting a lower "warning dose" from fallout than the National Academy of Sciences. This split undermined these reports and the attempt to handle growing public concern over fallout through national expert bodies. It appeared that further expert examination was needed to address these disparate views, and UNSCEAR thus emerged as the focal point of discussions on the risk of fallout.

UNSCEAR first met in 1956, and in 1958 produced a report which painted an alarming picture of the dangers of global fallout.[2] In chapter 5, the author explores why and how the committee was able to produce a report which went far beyond what the British and US governments would have liked in terms of highlighting the dangers of fallout. Growing concerns amongst Western scientists on the committee, many of whom were able to act independently of the wishes of their governments, were one factor. Soviet government interest in highlighting the risks of fallout in order to push for nuclear arms control, meanwhile, marched in step with Soviet scientists' concerns over fallout and their attempts to fight Lysenkoism.

Grassroots concerns over fallout also increased in the late 50s, fed by the growing realization that the impact of fallout was not distributed equally amongst peoples and regions, and that it rather could be concentrated in particular areas or "hot spots." Chapter 6 explores how scientists and activists began to question the state-led narratives of "average risk," and instead measure exposure and disseminate collected local data as a form of self-defense and protest against governments claims to have the exclusive right to determine what was acceptable risk for the whole population. Focusing on local groups in Minnesota in the US and Wales in Britain, the author shows that their "information" model of antinuclear activism effectively helped to erode the US Atomic Energy Commission's credibility and end its monopoly on atomic information.

The book's final chapter argues that the 1963 Partial Test Ban Treaty was an outcome of this growing concern over global fallout, as well as an artifact of the Cold War arms race: an attempt by the US to head off more comprehensive arms control and testing restrictions. The book's most original contribution here once again concerns the changing epistemics of fallout exposure. Higuchi argues that a key factor propelling concern was the concept of the maximum permissible dose for the general population. This dose was repeatedly revised downward at a time when radioactive contamination was steadily increasing, leading to a fast-diminishing margin of safety and increasing "hot spots" and "hot foods" in Britain and the US.

The past few decades have seen a steadily growing literature on the histories, cultures, and politics of nuclear fallout. Higuchi's *Political Fallout* is one of the few to focus on the politics of risk and safe dose levels.[3] Its

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[2] *Report of the United Nations Scientific Committee on the Effects of Atomic Radiation* (New York: United Nations, 1958). Available at: https://www.unscear.org/unscear/en/publications/1958.html, accessed 22 March 2023.

[3] On the US, see Robert A. Divine, *Blowing on the Wind: The Nuclear Test Ban Debate, 1954–1960* (New York: Oxford University Press, 1978); Spencer R. Weart, *Nuclear Fear: A History* (Cambridge, Mass.: Harvard University Press, 1988); Lawrence S. Wittner, *The Struggle Against the Bomb, vol. 2: Resisting the Bomb: A History of the World Nuclear Disarmament Movement, 1954–1970* (Stanford, CA: Stanford University Press, 1997); Paul Boyer, *Fallout: A Historian Reflects on America's Half-Century Encounter with Nuclear Weapons* (Columbus, Ohio: Ohio University Press, 1998). Paul Rubinson, *Redefining Science: Scientists, the National Security State, and Nuclear Weapons in Cold War America* (Amherst; Boston: University of Massachusetts Press, 2016). On Britain: Lorna Arnold and Mark Smith, *Britain, Australia and the Bomb: The Nuclear Tests and Their Aftermath* (Basingstoke, UK; New York: Palgrave Macmillan, 2006); Roger Cross, "British Nuclear Tests and the Indigenous People of Australia," in Douglas Holdstock and Frank Barnaby, eds., *The British Nuclear Weapons Programme, 1952–2002* (London: Frank Cass, 2003): 75-88; and Sue Rabbitt Roff, "Long-Term Health Effects in UK Test Veterans," in Holdstock and Barnaby, eds., *The British Nuclear Weapons Programme, 1952–2002*: 99-112. On the USSR: Susanne Bauer, "Radiation Science After the Cold War: The Politics of Measurement, Risk, and Compensation in Kazakhstan," in Olga Zvonareva, Evgeniya Popova, and Klasien Horstman, *Health, Technologies, and Politics in Post-Soviet Settings: Navigating Uncertainties* (Basingstoke, UK: Palgrave Macmillan, 2017): 225-249; Magdalena E. Stawkowski,

central and most original contribution is to point to the importance of the epistemic definitions and standards in relation to risk in shaping the politics of nuclear fallout. The book is also notable for its comparative frame: it weaves together case studies spread across the US, Britain, Japan and the Soviet Union with studies of international discussions within UNSCEAR and in relation to the Partial Test Ban Treaty. In addition to historians of science and technology, and scholars of the Cold War, the book will thus also be of interest to those interested in the history of risk and risk societies.

The book, like any other, is not without weaknesses. Its comparative frame falters at times: the spread of studies between these countries sometimes feels unbalanced (Japan for example is only prominent in chapters 2 and 5), and at points the author draws conclusions that appear to apply mostly (or only) to the US (as in, for example, the local turn in the politics of risk in chapter 6). Overall, however, the book is an important and significant contribution to the growing literature on the politics of nuclear weapons, and specifically fallout. As the world exits from the recent COVID-19 pandemic, and looks back on how COVID risk was understood and defined by experts and policymakers, this book stands as a reminder that such conceptions, no matter how scientific, are at least partially politically and socially constructed.

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"Radioactive Knowledge: State Control of Scientific Information in Post-Soviet Kazakhstan" (PhD diss., University of Colorado-Boulder, 2014); and Cynthia Werner and Kathleen Purvis-Roberts, "After the Cold War: International Politics, Domestic Policy and the Nuclear Legacy in Kazakhstan," *Central Asian Survey* 25, no. 4 (2006): 461-480. Radiation dosage levels are explored in: Barton C. Hacker, *Elements of Controversy: The Atomic Energy Commission and Radiation Safety in Nuclear Weapons Testing, 1947–1974* (Berkeley: University of California Press, 1994), 92-100; and Laura J. Harkewicz, "'The Ghost of the Bomb': The Bravo Medical Program, Scientific Uncertainty, and the Legacy of U.S. Cold War Science, 1954–2005" (PhD diss., University of California-San Diego, 2010).

## Response by Toshihiro Higuchi, Georgetown University

As a first-time author whose book was released at the onset of the COVID-19 pandemic, I am deeply grateful to the H-Net community for providing a platform to discuss my work with colleagues worldwide. I was thrilled when H-Environment published a roundtable review in October 2021, which explored my book's accomplishments, shortcomings, and promising avenues for further inquiry, primarily from the perspective of environmental history. Originally trained as an international and US diplomatic historian with a focus on nuclear affairs, I was also eager for feedback within these fields of study. I am therefore honored to have this second opportunity, this time sponsored by H-Diplo, to engage in a stimulating conversation with a group of respected scholars who share my interest in the intersection of science, the environment, and international affairs. I would like to express my sincere gratitude to Kurk Dorsey, Simo Laakkonen, Elisabeth Roehrlich, and Waqar Zaidi for their generous time and insightful comments. My heartfelt thanks also go to David Holloway for his thoughtful introduction and also to Frank Gerits and Diane Labrosse for organizing this fascinating dialogue.

*Political Fallout* recasts a familiar Cold War narrative. While contemporaries and historians alike have hailed the 1963 Partial Test Ban Treaty (PTBT) as a major landmark in nuclear arms control, my book reexamines this pivotal disarmament agreement, which halted atmospheric nuclear testing, as one of the first global responses to a human-made environmental threat, decades before the world started confronting ozone layer depletion, climate change, and other similar challenges. In doing so, the book situates the Cold War within the context of the Anthropocene, the proposed geological epoch marked by humanity's profound impact on the planet.[1]

The relationship between the Cold War and the changing environment, however, was far from clear and straightforward. As radioactive contamination resulting from nuclear-weapons testing spread further and persisted longer, the full extent of its impact on human health and the environment became difficult to grasp. This paradox of scale, which is a defining feature of global-scale, slow-moving disasters in the Anthropocene, transformed scientific knowledge surrounding radioactive fallout—and its ethical and policy implications—into a political battleground. To my great satisfaction, the reviewers find my book's focus on the "politics of risk" both innovative and productive.

Yet, some of the reviewers express reservations about my analysis of risk politics. Dorsey argues that some of the events discussed in the book contradict my claim, demonstrating either blatant distortion of science or the decisive impact of scientific discoveries. To fully address this point, a clarification of my epistemological stance is necessary. Words like "distortion" imply a clear separation between science and politics. However, the potential health effects of globally dispersed fallout are inherently uncertain, creating a wide range of valid scientific opinions. This epistemic ambiguity allowed actors on all sides of the debate to push the boundaries of scientific knowledge to further their political goals while maintaining a veneer of scientific legitimacy. Such ambiguity also complicated the relationship between science and policymaking. As Dorsey observes, reports of "hot spots" across the United States did change President Dwight Eisenhower's perspective on fallout; this change was not due to definitive proof of its dangers, however, but because these reports shattered the president's trust in his scientific advisors. The relationship between science and politics in the Anthropocene is therefore much more complex than a simple story of distortion or discovery.

[1] For more on the Anthropocene, see John R. McNeill and Peter Engelke, *The Great Acceleration: An Environmental History of the Anthropocene Since 1945* (Cambridge, MA: The Belknap Press of Harvard University Press, 2014); Julia Adeney Thomas, *Altered Earth: Getting the Anthropocene Right* (Cambridge: Cambridge University Press, 2022); Julia Adeney Thomas, Mark Williams, and J. A. Zalasiewicz, *The Anthropocene: A Multidisciplinary Approach* (Cambridge: Polity Press, 2020).

My response to Dorsey's inquiry also addresses Roehrlich's suggestion regarding the concept of epistemic communities. Coined by political scientist Peter M. Haas in the early 1990s, the term describes "a network of professionals with recognized expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that domain or issue-area."[2] Although initially appealing and seemingly ideal for my analysis, I ultimately opted against employing the term for a few reasons. First, its state-centric focus was too narrow for my purposes. Second, its portrayal of a harmonious, autonomous community bound by shared norms and beliefs did not align with the reality of the radiation protection community, which I found to be far more porous, diverse, and influenced by external forces. Finally, the concept's emphasis on policy impact overshadowed the critical analysis of knowledge production that I sought to achieve. That is why my book uses words like "blowback," "stalemate," "divide," and "negotiation" to depict the fluidity and dynamic nature of knowledge within this complex field.

The reviewers also identify some limitations in the book's comparative and integrative framework. Zaidi detects an imbalance in the case selection, suggesting that some of the conclusions in the book might primarily or solely apply to the United States. Dorsey echoes this critique, concluding that the book has not fully addressed the contrasting approaches to environmental problems within the two blocs. With characteristic wit, he drives his point home: while the Japanese government "buried the fish but not the story," the Soviet authorities had a long, notorious history of attempting to suppress even the most basic information about issues ranging from whaling to Chernobyl. While he acknowledges my engagement with the question of scientific freedom across the Cold War divide, he finds my historiographical review perplexing, noting that the works that I cite as supporting the traditional view were published around the same time as those that are supposedly revisionist.

To address Dorsey's last point first, my choice of sources on the topic of orthodoxy was indeed confusing. My intention was to cite the latest works that place the traditional view within its historical context. On the broader question of Cold War differences, my book does include some references to contrasting public relations policies. For example, chapter 1 shows that the Soviet government rarely disclosed its nuclear tests, whereas the US and British authorities, while announcing their tests, attempted to reassure the public about their safety. Nonetheless, I agree that I should have discussed such contrast throughout the book for more symmetrical analysis, as Zaidi has urged. The absence of grassroots fallout surveys in the Soviet Union, for instance, deserves analysis given their importance in the United States and Britain (chapter 6). At the same time, I still believe that the primary value of my book lies in the analysis of similarity and convergence between the Cold War blocs that were facing the same, global-scale environmental problem. I hope that my book presents a valuable counterpoint to the prevailing narrative in earlier scholarship, which often singles out the Soviet Union as uniquely detrimental to public health and the environment.[3] While the book strives to compare the East and the West, its analysis unfortunately overlooks the crucial role played by the Global South. India, Ghana, and other postcolonial nations in Asia and Africa were actively engaged in the fallout controversy through various international platforms, including the United Nations, the Afro-Asian Conferences, and the Non-Aligned Movement. Thankfully, a recent surge in scholarship has effectively remedied this notable gap in the book's analysis. The work of these scholars collectively decenters the Global North and offers compelling, truly global accounts of nuclear testing history.[4]

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[2] Peter M. Haas, "Introduction: Epistemic Communities and International Policy Coordination," *International Organization* 46, no. 1 (1992): 3.

[3] For instance, Murray Feshbach and Alfred Friendly, *Ecocide in the USSR: Health and Nature under Siege* (New York: BasicBooks, 1992).

[4] Itty Abraham, "Decolonizing Arms Control: The Afro-Asian Legal Consultative Committee and the Legality of Nuclear Testing 1960-64," *Asian Journal of Political Science* 26, no. 3 (2018): 314-330; Jean Allman, "Nuclear Imperialism and the Pan-African Struggle for Peace and Freedom: Ghana, 1959–1962," *Souls* 10, no. 2 (2008): 83-102; Austin R.

Finally, the reviewers are nearly unanimous in noting the book's limited engagement with popular culture. Dorsey's opening Peanuts cartoon poignantly highlights the public's crucial role in the fallout controversy. Roehrlich notes the conspicuous lack of reference to the "pop-cultural hype that surrounded tests." Laakkonen points out the sheer diversity of public responses to fallout, arguing that "[the] atomic bomb caused such a wide range of socio-cultural effects that they cannot be explained with the help of natural science alone." All points are well taken. My book's focus on science and policymaking might have inadvertently tilted the balance away from the social, cultural, and psychological dimensions of the fallout controversy, which are well explored in existing scholarship.[5] However, I wrote my book to challenge the limitations of the mainstream approach. While the analysis of popular reactions to fallout as a manifestation of fear offers valuable insights, it unfortunately obscures the contentious and precarious epistemological basis of the supposedly rational viewpoint. In this way, my book joins scholarship that critically examines the logic and basis of Cold War rationality.[6] Furthermore, I find the standard causal explanations that link the fallout controversy to the nuclear test ban to be insufficient. These accounts often vaguely attribute the test ban to public anxieties and antinuclear activism, without elucidating the specific mechanisms through which such forces shaped policy decisions.[7] I strongly concur with Laakkonen's call for a fresh examination of nuclear culture and its influence in order to more fully understand the diverse social responses, their connections to broader concerns, and their enduring legacies beyond the PTBT.

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Cooper, "The Tunisian Request: Saharan Fallout, US Assistance, and the Making of the International Atomic Energy Agency," *Cold War History* 22, no. 4 (2022): 407-436; Cooper, "The Argentella Scandal: Why French Officials Did Not Make Corsica a Nuclear Test Site in 1960," *The Nonproliferation Review*, DOI: 10.1080/10736700.2023.2187529; Robert A. Jacobs, *Nuclear Bodies: The Global Hibakusha* (New Haven, CT: Yale University Press, 2022); Matthew Jones, *After Hiroshima: The United States, Race and Nuclear Weapons in Asia, 1945–1965* (Cambridge: Cambridge University Press, 2010); Mervyn O'Driscoll, "Explosive Challenge: Diplomatic Triangles, the United Nations, and the Problem of French Nuclear Testing, 1959–1960," *Journal of Cold War Studies* 11, no. 1 (2009): 28-56; Abena Dove Osseo-Asare, *Atomic Junction: Nuclear Power in Africa after Independence* (Cambridge: Cambridge University Press, 2019); Roxanne Panchasi, "'No Hiroshima in Africa': The Algerian War and the Question of French Nuclear Tests in Sahara," *History of the Present* 9, no. 1 (2019): 84-112; Rob Skinner, "Bombs and Border Crossings: Peace Activist Networks and the Post-Colonial State in Africa, 1959-62," *Journal of Contemporary History* 50, no. 3 (2015): 418-438.

[5] Paul Boyer, *By the Bomb's Early Light: American Thought and Culture at the Dawn of the Atomic Age*, second edition (Chapel Hill: University of North Carolina Press, 1994); Gerard J. DeGroot, *The Bomb: A Life* (Cambridge, MA: Harvard University Press, 2004); Jonathan Hogg, *British Nuclear Culture: Official and Unofficial Narratives in the Long 20th Century* (London: Bloomsbury, 2016); Yuka Tsuchiya, *Science, Technology and the Cultural Cold War in Asia: From Atoms for Peace to Space Flight* (Abingdon, Oxon: Routledge, 2022); Spencer Weart, *The Rise of Nuclear Fear* (Cambridge, MA: Harvard University Press, 2012 [1988]); Allan M. Winkler, *Life under a Cloud: American Anxiety about the Atom* (New York: Oxford University Press, 1993); Shun'ya Yoshimi, "Radioactive Rain and the American Umbrella," *Journal of Asian Studies* 71, no. 2 (2012): 319-331, translated by Shi-Lin Loh.

[6] For Cold War rationality, see Jamie Cohen-Cole, *The Open Mind: Cold War Politics and the Sciences of Human Nature* (Chicago: University of Chicago Press, 2016); Paul Erickson, *The World the Game Theorists Made* (Chicago: University of Chicago Press, 2015); Paul Erickson, Judy L. Klein, Lorraine Daston, Rebecca Lemov, Thomas Sturm, and Michael D. Gordin, *How Reason Almost Lost Its Mind: The Strange Career of Cold War Rationality* (Chicago; London: University of Chicago Press, 2013); Sharon Ghamari-Tabrizi, *The Worlds of Herman Kahn: The Intuitive Science of Thermonuclear War* (Cambridge, MA: Harvard University Press, 2005); Fred M. Kaplan, *The Wizards of Armageddon* (New York: Simon and Schuster, 1983); Ron T. Robin, *The Making of the Cold War Enemy: Culture and Politics in the Military-Intellectual Complex* (Princeton, NJ: Princeton University Press, 2001).

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