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BOOK REVIEWS

Alex Wellerstein, *Restricted Data: The History of Nuclear Secrecy in the United States*

Chicago: The University of Chicago Press, 2021. Pp. 528. ISBN 978-0-2260-2038-9. $35.00 (hardback).

Devin Short

University of Washington

Perhaps the most surprising aspect of Alex Wellerstein's *Restricted Data*, a 2021 monograph on the history of nuclear secrecy in the United States, is his skilful avoidance of familiar topics related to nuclear weapons, the Second World War and the Cold War. Wellerstein has managed to provide a genuinely new contribution to some of the most well-worn areas in multiple historical subfields. Wellerstein takes his title from a new category of secret information designated in the 1946 Atomic Energy Act. Restricted data were unique in the history of the USA because it classified information according to its subject matter rather than its source. Anything related to nuclear technology was by its nature classified regardless of where the information resided or who produced it. This was in stark contrast to US classification schemes before and after, in which information had to be classified by an agent with authority over documents or communications. According to Wellerstein, this regulation and the thinking and practices surrounding it represent the US nuclear 'secrecy regime'.

For Wellerstein, a secrecy regime is not created by law or all at once. It is instead a prevailing attitude towards secrecy and its purpose in government. Wellerstein argues that the US nuclear secrecy regime has undergone three major transformations, and he presents these developments in three parts of three chapters each. Initially, prior to government concern with information about the subatomic world, some scientists collaborated to self-censor their work after realizing that nuclear fission could generate an extraordinarily dangerous uncontrolled chain reaction. While it had existed prior to the war, the US secrecy regime was established in practice alongside the Manhattan Project. This was the regime of 'absolute secrecy', in which government and scientists

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generally collaborated to keep all nuclear information secret. While not entirely successful, this approach was widely accepted because of wartime threats. There was also broad agreement that the first regime would in some sense end with the war because leaders intended to shock enemies into submission by releasing large quantities of information about the devastating power of US nuclear weapons immediately after destroying Japanese cities.

The second secrecy regime is represented in Wellerstein's text by 'the problem of secrecy'. Absolute secrecy, and even informal self-censorship prior to the war, were never without tension. Many rejected the idea that controlling information promoted security, and scientists resisted the idea both because their careers depended upon publication and because secrecy might hinder their pursuit of knowledge. Absolute secrecy would also be untenable for conservative leaders in the long term because government would at least have to establish outlines of 'the secret' in order to maintain legitimate control of information in a democratic society. The 1946 Atomic Energy Act, the hand-off between the military Manhattan Project and the civilian Atomic Energy Commission, and the formation of congressional committees to oversee the AEC established the new regime. The 'always-already secret' nature of restricted data meant that the AEC never created secrets, and one of its largest and most complicated tasks was to establish systems by which born-secret information could be declassified. While some within the commission, notably its first leader, David Lilienthal, were committed to creating an open system that promoted transparency, Wellerstein argues the catastrophic nature of nuclear weapons and the sheer volume of information to be declassified were insurmountable problems for reformers. Furthermore, since all attempts to change the secrecy regime were themselves classified activities, reformers could not seek the support of those outside the establishment or provide explanation when they appeared to promote the regime.

The third incarnation of the US nuclear secrecy establishment is what Wellerstein calls the Cold War regime. Rather than grapple with complex social and political problems, US policy since the mid-1950s has attempted to draw a bright line between military secrets and peaceful science and industry. This serves to amplify the tensions inherent in any nuclear secrecy regime because nuclear technology is dual-use, representing both a terrifying weapon and a potentially transformative civilian energy source. One of the major pivot points between previous policies and the Cold War regime had to do with the Teller–Ulam design for radiation implosion, a method to detonate the most powerful thermonuclear weapons. While many nuclear secrets are difficult to separate from peaceful knowledge, radiation implosion was such a specific design that it served as an archetype for distinctions between peaceful and dangerous information. That apparently clear line was broken when people Wellerstein calls 'anti-secrecy activists' showed that they could use public sources to describe radiation implosion so accurately that US authorities were forced to suppress unclassified information. US regulators took the bait and sued when in 1979 a small magazine called the *Progressive* announced that it would publish an article in which journalist Howard Morland reconstructed their most dangerous secret. The First Amendment case to publish the information despite its restricted status was eventually so strong that the government dropped the lawsuit rather than allow a court to rule against restricted data. According to Wellerstein this situation is representative of the whole history of the US nuclear secrecy regime, which is sprawling, pervasive, urgent, conflicted, and ultimately uncertain.

One of the few criticisms one could make is that Wellerstein's project might simply be too big. The main text weighs in at 415 pages, and even individual chapters might be too long and encompass too much to serve as useful excerpts. But this is often due to the arcane nature of disputes within and across branches of the federal government, and

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Wellerstein has done an admirable job synthesizing federal archives with sources such as Lilienthal's diaries to create a history we haven't seen before. The book will be of great value to most readers with an interest in the history of nuclear science and technology or US military and political history. For professional historians this work should also take its place alongside literature on agnotology and archival silences, especially since Wellerstein takes care to focus on historian Henry DeWolf Smyth, who was commissioned to write a history of the Manhattan Project as it happened for release after the war. There is much to learn here both about the role historians play for the authorities and our role as critics of them, as well as the creation and maintenance of the source material we depend on.

Historians of science should take special note of a point that is slightly off Wellerstein's main line. In Section 3.1, Wellerstein takes up an argument introduced by Rebecca Press Schwartz that one of the reasons physics has loomed so large over other disciplines both in popular culture and in the history of science is that physicists had published the most on nuclear science at the time the US secrecy regime swallowed the subject. During the Second World War and for much of the Cold War, knowledge about nuclear chemistry, metallurgy, engineering and medicine was largely born secret (and one imagines this was not only true in the USA). As a result, Smyth's embedded history and US information campaigns linked the mystique of a brave new scientific world to the discipline of physics even though physicists only do a fraction of the scientific work associated with any nuclear project. Viewed alongside Schwartz's argument, Wellerstein's book encourages us to reflect on the history of our discipline and on how people come to see some areas of knowledge as more valuable or fundamental than others.

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Michel Anctil, *Luminous Creatures: The History and Science of Light Production in Living Organisms*

Montreal and Kingston: McGill-Queen's University Press, 2018. Pp. xvii + 467. ISBN: 978-0-7735-5312-5. $49.95 (hardback).

Sue Hemmens

Marsh's Library, Dublin

Light in darkness is a powerful metaphor, and the production of light by living creatures has proved a fascinating subject across the span of recorded knowledge. For many outside the field, interest in current work was sparked most recently by Edith Widder's communicative videos documenting discoveries from the deep oceans over the last decade. Written from the point of view of an active researcher in the field, Michel Anctil's detailed and engaging book takes an essentially chronological approach to the gradual revelation of the biochemical processes underlying the phenomenon of bioluminescence. In some respects, as he notes early in the book, changes in the understanding of these processes parallel the emergence of biochemistry as a discipline, together with the concepts of enzymatic action. The later chapters of the book contain detailed and occasionally intensely personal anecdotes of the human beings whose lives and intellects were