Media Fields JOURNAL

Mutual Exposure,
or Colonialism's Radiant Fallout

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After the flash of the bomb lies life: life mutated, life mediated. And after the flash of the bomb lies fallout, atomic half-lives that follow wind and water, woven into our bones and cascading through the ecosystem. Longer still lies the slow burn of nuclear waste, the million-year lifespan of Yucca Mountain and the unknown toxicity of other sites still open to the air. Radiation is a message, a signal that persists. The nuclear transects life, cutting across political taxonomies as we are exposed, together. The invisible presence of radiation similarly cuts through 1127 Irving Avenue, one of three superfund sites in New York City, and the empty warehouses, lots, repair shops and delis that surround it. The site was previously host to a processing plant for monazite sands from the Belgian Congo. Excess thorium oxalate sludge, produced during monazite's refinement, had been illegally dumped into the waste stream, and the limits of the toxic spill now extend far beyond the lot lines, seeping alongside sewer mains and deep into the soil of surrounding buildings. There is no distinct border; rather, radiation levels decrease in miniscule gradations until they reach the level of background radiation.

I aim to map 1127 Irving Avenue and its conflicting geographies. In effect, I am asking where exactly 1127 Irving Avenue is. While 1127 Irving Avenue is located in Brooklyn, its nuclear relations are emergent from the Belgian Congo, where the monazite sands were originally mined. I use nuclear relations to refer to the technicity of radioactive material as it acts upon the

body and marks the body via increased risk. We are produced by our environment as our flesh and bones are indelibly marked by traces of explosions past, turning organic matter into environmental media.[1] In charting and sensing the outlines of the site's radiation, both temporally and spatially, a second border or logic begins to emerge. I term this a chemical or chemopolitical border, one that sits below property lines and international borders, produced via the way that nuclear waste irradiates, contaminates, and mediates its surroundings. This both articulates how toxic waste produces a certain territoriality while underscoring the imbrication of the chemical and the colonial at 1127 Irving Avenue. How does the chemical waste at the site make present the colonial violence of the Belgian Congo? How does radiation mediate different, yet mutual, exposures to the same radioactive material, across time and space?

The irradiated ground below 1127 Irving Avenue is largely indistinguishable from its surroundings. Beginning in 1920, the now-defunct Wolff-Alport corporation used the site to process and extract rare earths from monazite sand.[2] Monazite strikes a minor note in the history of the nuclear, as does Wolff-Alport. But routes matter, particularly routes like the one taken by monazite from the Belgium Congo to the Brooklyn/Queens border. Monazite is a moderately radioactive element that, when processed, can contain up to 2 percent cake II (thorium and uranyl hydroxide) and 10 percent thorium.[3] Little archival information exists on Wolff-Alport, but there was only one active mine during the early 20th century in the Congo that could have supplied them with monazite: Shinkolobwe.[4] Named after a local thorny fruit that, when boiled, cools off on the outside but still scalds on the inside, Shinkolobwe had the richest accessible uranium ore in the early twentieth century, along with monazite deposits.[5] It was desired by both sides of World War II and, after a treaty with Belgium, was the source of the majority of the uranium used in the "Little Boy" that flattened Hiroshima.[6]

A side product of monazite processing is radioactive thorium oxalate sludge. Until 1947, Wolff-Alport dumped this sludge directly into the sewer, contaminating the soil. This practice ended in 1948 when the Atomic Energy Commission (AEC) began to buy thorium from Wolff-Alport, procuring at least 23,937 kilograms of thorium oxalate sludge between 1948 and 1951. In 1987, a Department of Energy (DOE) site report declared that "AEC neither owned nor controlled the property or the operation . . . [T]he Department of Energy has no authority under the Atomic Energy Act of 1954, amended, to conduct remedial action on this site."[7] Because the toxic spillage on the site

was insufficiently nuclear—the thorium oxalate sludge had been bought by, but not explicitly produced for, the AEC—no remedial actions were approved until 2014.[8] In 2014, when the Environmental Protection Agency (EPA) began to clean up the site, it was noted that toxic elements could "be available for inhalation as a particulate" due to "a significant amount of vehicular movement."[9] The EPA survey further discovered that there was deep soil contamination "down to at least 20 feet."[10] These risks—the limits of the chemical event begun almost a century earlier, which we could also call its fallout following Joseph Masco[11]—extended to both pedestrians and nearby workers. In response, the EPA placed a temporary concrete cap on the site, reducing surface risk while leaving thorium's toxic trace below. The following map documents thorium's three-dimensional presence (Fig. 1). An aerial map erases the depth of nuclear contamination, and this map is likely no longer accurate as radioactive matter continues to leach through the ground. Even when capped, the thorium in the soil will continue to persist. To return to the aptly named Shinkolobwe, a surface cool to the touch might still be scalding below.

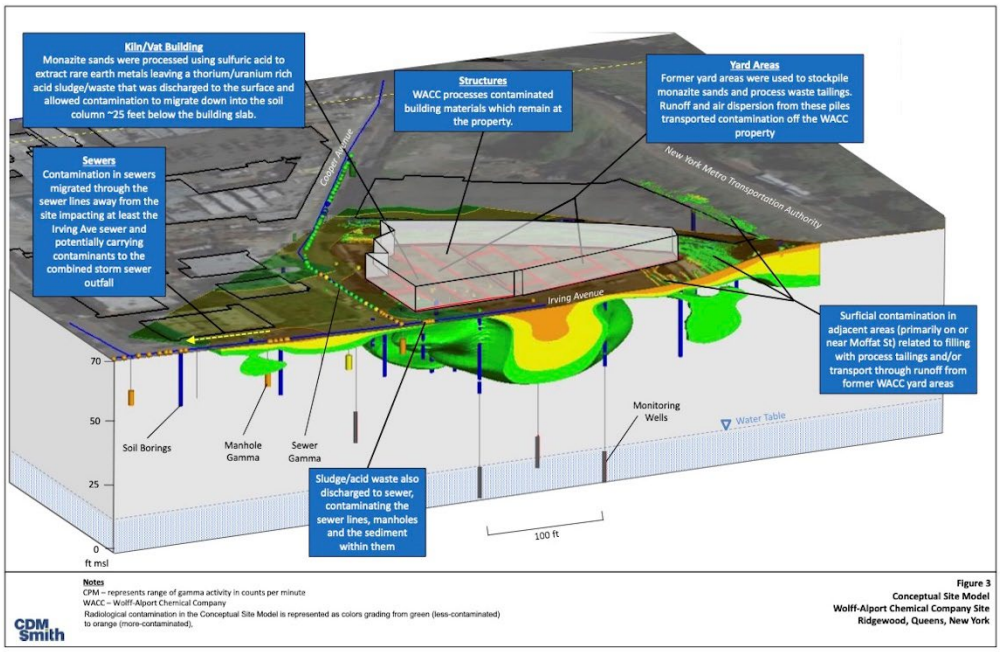

Figure 1. United States EPA, "Record of Decision: Wolff-Alport Superfund Site," 54. This figure depicts the deep soil contamination at the site. The multiple lot lines covered are shown in red, while the blue sewage lines are shown as continuing sources of contamination. **https://semspub.epa.gov/work/02/528285.pdf**

After the flash of the bomb, and beneath sites of nuclear extraction and production, radiation invisibly and imperceptibly emanates from the ground. The nuclear event far exceeds the time it takes to extract, refine, and process nuclear material, extending into the deep future. The United States Nuclear Research Commission planned Yucca Mountain to last a million years, but in the far-enough future, all sinks become spills.[12] The endurance of nuclear material produces a specific temporality that exceeds both individual lifetimes and the broader horizon of the human. It creates a diffuse geography with differential effects, minute flashes in geologic time but incomprehensible to the lifespan of a person. Remediation can thus be thought of as an "exercise in shifting materials in space rather than eliminating harm altogether."[13] Materials, however, are not always shifted. The toxic geographies produced by the non-remediation and non-movement of nuclear waste escape the spectacular in favor of the incremental, played out across multiple temporal scales.[14] The toxic effects at play here, at Shinkolobwe and at 1127 Irving Avenue, have different impacts but are both emergent properties of the nuclear relations in the ground of each site. Further, the long duration of the nuclear event runs parallel to and is intertwined with the long afterlife of colonialism. It forms a chemical geography that persists long after borders are redrawn, reminding us of the radical presence of the past.

The nuclsear can be thought of as multi-scalar phenomena, acting in milliseconds and over millennia, the burst of the bomb and the burn of the mine. Scientists during the Trinity Test in 1945 went temporarily blind, senses overwhelmed, terrified of how, in less than a second, a new world was ushered in.[15] Joseph Masco elaborates on this in his articulation of a "nuclear sublime," which emerges from the tensions between the risk of physical harm and sensory overload produced by the bomb and "the reality of the bomb as a device built to certain specifications and detonated at precise moments (and thus under human control)."[16] Long-term exposure to radiation is, unlike in the nuclear sublime, marked by the absence of sensory input and somatic apprehension as it unfolds over time. The absence of overwhelming stimuli, or even any registerable stimuli, place it opposite to the classical Kantian sublime, while the emphasis of the duration of exposure, harmful effects amortized over decades, helps materialize toxic exposures unfelt during single moments. Absent spectacle, it takes a different sort of work to attune oneself to what exactly is happening.

Radiation is a signal that harms. It is received over time and space: time, due to the lag between exposure and symptom, and space, because risk is linked to the ground upon which we stand. Or perhaps we can think of this second effect as a production of territory via the marking of space. If the warehouses at 1127 Irving Avenue were rebuilt, the harms would remain below; the radioactive message, or trace, is stored in and by the earth. The EPA warned local autobody workers to "not lay on their back" meaning that risk is further linked to gesture and bodily movement in relation to radioactive ground.[17] The more we touch the earth, the more it touches us back. Does walking through 1127 Irving Avenue, or lying down, render someone materially witness to, on a minor register, the nuclear relations that emerge from Shinkolobwe? If so, and to restate my earlier question, where then is 1127 Irving Avenue? What politics is born of this mutual exposure? In asking where 1127 Irving Avenue is, I also want to ask when it is, both due to the duration of the nuclear event and to place 1127 Irving Avenue within a longer legacy of colonial violence. That is to say, this site cannot be separated from broader histories of colonialism, resource extraction, and the dawn of the nuclear age that led to the extraction of monazite and its processing at 1127 Irving Avenue. It is part of the long afterlife of colonialism which means that, perhaps, being exposed to the increased radiation at the site is a partial exposure to the violence of Shinkolobwe and the Belgian colonial regime at large. A focus on the history and present of the site refuses to consign these phenomena to the past and rejects the future oriented politics of remediation.

To repeat: when someone, such as an autoworker, pedestrian, or EPA inspector, walks across 1127 Irving Avenue, they are exposed to a certain risk. This risk, dependent on both the length of exposure and how the body is oriented to the ground, increases their chance of cancer.[18] This exposure to risk is the product of Belgian colonialism, American imperialism, corporate malfeasance, and bureaucratic failure. It is thus an exposure to certain historical phenomenon that at first seem far away from 1127 Irving Avenue. When someone walks across the site, they do not feel the slow irradiation of their flesh. The effects they face are by no means the same as those a miner at Shinkolobwe might encounter, but in each of these events the body is marked by radiation from the same source and enmeshed in the same historical processes – albeit at different intensities. To walk or work at 1127 Irving Avenue then is to be materially witness to Shinkolobwe; the logic of the colony leaks alongside monazite and thorium sludge.

By examining how someone at the site is ensnared in the same set of historical processes and nuclear relations as Shinkolobwe, we return to the question of location. When monazite sands were exported to Brooklyn, those sands were not inert but rather actively produced 1127 Irving Avenue. The ground itself became radioactive so that even as its geologic features and soil type are continuous with the surrounding lots, it also stands apart due to elevated radiation levels. Everywhere on the planet has some level of background radiation, but the source and intensity of the radiation here makes it different from its surroundings. The nuclear writes the ground as much as it writes the body. This deep soil contamination makes the multiple locations of 1127 Irving Avenue visible. It is colonized Canarsee land, located on the border of Kings and Queens Counties in the City of New York, while the ground is irradiated and forms an extension of the nuclear relations at Shinkolobwe. The nuclear produces a certain type of space, one legally and politically defined through bureaucratic programs, like superfund sites, but also through the exposure of the body to certain levels of risk. To inhabit or even pass through 1127 Irving Avenue requires an acknowledgement of this hidden border produced by distinctly radiant topology of nuclear waste. Raw materials not only affectively but materially haunt the city, reminding us of the long legacy of colonial violence in the built environment, and how these raw materials, like thorium, are active agents in the city and rearticulate the already complex boundaries between colony and metropole.

This chemical and/or nuclear border, which lies in the ground and below the surface, is a chemical or chemopolitical border. I am using this term in two ways. The first is that a chemical border disarticulates how chemical waste, such as thorium oxalate sludge, creates boundaries distinct from the borders of the state or even the bureaucratic borders of the EPA. Colonialism, and supply chains, crosses borders, and thinking each of these sites alone obscures their materially interconnected presents. An understanding of the chemical as that which both exceeds national borders and leaks through and refuses the spatial separation of colony and empire reveals the chimeric nature of toxic landscapes. Second, the notion of a chemopolitical border as separate from the borders of the state lets us think through an extended notion of the colony. Toxic waste reproduces a specific set of relations or geo-logics between those who have the right to bodily integrity and those who don't, between those bodies deemed poisonable and those not.[19] Imagining 1127 Irving Avenue as a discretely bounded territory reduces the historical valence of the site and seeks to depoliticize thorium oxalate sludge by presenting it as a technocratic dilemma to be solved rather than an

instantiation of colonial chemical violence at a distance. Spatially and temporally tracing this chemopolitical border stretches our understanding of the local and reveals the ways that the ground beneath a nondescript strip of warehouses is intimately linked to the brutality of a colonial regime an ocean and a century away.

A spatial re-reading of the nuclear not as a marker but as a producer of 1127 Irving Avenue shifts the question of what irradiated land is, to a question of what irradiated land does. Over decades and continents, the radioactive signature of Shinkolobwe continues to mark certain bodies via an intensification of risk. Shinkolobwe exists in Brooklyn and Queens both physically and as a relation, a presence that may seem spectral and a remnant of the past, but one that nevertheless continues to structure the present by rendering certain people and spaces pollutable. Mutual exposure underscores that these two events do not stand alone and cannot be understood alone. It is also an injunction to follow the supply chain and refuse to see sites like 1127 Irving Avenue as singular, as the specific mode of chemical violence whose chemopolitical border can only be understood by following it over time and across the Atlantic. There is a message here in the soil. This figure of the colonial mine and its offshoots, these extensions of the colony into empire, provide a mechanism through which we can envisage the complex toxic geographies of the present and mutual exposures to them. These look less like the clean borders of the colonial state, cleaving through peoples and ecosystems, and more like the bulbous, three-dimensional gradations of soil contamination.

Notes

1 Elizabeth M. DeLoughrey, "The Myth of Isolates: Ecosystem Ecologies in the Nuclear Pacific," *Cultural Geographies* 20, no. 2 (2013): 179. Also, see Stacey Alaimo's theorization of trans-corporeality and injunction in *Bodily Natures* that we must think through and across bodies as they are inter-meshed in an active world. Stacey Alaimo, *Bodily Natures* (Bloomington: Indiana University Press, 2010).

2 US Department of Energy, *Summary Report and Designation/Elimination Analysis for Wolff-Alport Chemical Corporation Brooklyn, New York,* James Fiore. NY.30-1, Washington D.C.:DOE, September 29, 1987, online, **https://cpb-us-w2.wpmucdn.com/blogs.pace.edu/dist/0/195/files/2019/03/DoE-Wolff-Alport-NY.30-1-1-20yqekr.pdf.** Accessed November 29, 2023. This was previously unknown to the public and there were no contemporary references to Wolff-Alport in newspapers of the time besides obituaries for Max Alport who died in 1945.

3 Anselmo S. Paschoa and Friedrish Steinhäusler, *Technologically Enhanced Natural*

Radiation, vol. 17 of *Radioactivity in the Environment* (Amsterdam, NL: Elsevier, 2010), 29–85.

4 Department of the Interior, *The Geologic Occurrence of Monazite,* William C. Overstreet. Washington DC: GPO, 1967, Online. https://pubs.usgs.gov/pp/0530/report.pdf. Accessed November 29, 2023.

5 Tom Zoellner, "A (Radioactive) Cut in the Earth That Will Not Stay Closed," *Scientific American,* 27 March, 2009.

6 John Avery and Mads Fleckner, "Congo Uranium and the Tragedy of Hiroshima" (University of Copenhagen, *55th Pugwash Conference*, Hiroshima, July 2005).

7 Fiore, 5. The contested and ambiguous responsibility for the site, between Wolff-Alport and the AEC, produces an archival absence that is compounded by the highly classified nature of much of the AEC's supply chain.

8 Ibid., 4, 5. It is difficult to separate the current decision to remediate the site from the ongoing gentrification and development in the surrounding area, and the ways that the decision to/not to clean up toxic waste falls along racial and class lines. Yet, when Wolff-Alport was actively dumping toxic sludge into the sewers, and for decades after, the surrounding area was predominantly white, with a mix of middle and working-class families. This complicates readings of the original dumping of toxic waste through the demographics of Bushwick today, while also underscoring the environmental racism that leads to certain sites not undergoing remediation or undergoing a delayed remediation. "1943 New York City Market Analysis: 3c. Brooklyn," Center for Urban Research at the CUNY Graduate Center, www.1940snewyork.com/. Accessed November 29, 2023.

9 Environmental Protection Agency, *Pollution/Situation Report Profile - EPA OSC Response,* Eric M. Daly. POLREP#36: EPA, August 11, 2014, https://response.epa.gov/site/sitrep_profile.aspx?site_id=8030. Accessed November 29, 2023.

10 Environmental Protection Agency, *Wolff-Alport Chemical Company Radiological Site,* Eric M. Daly. RV2: EPA, 2021, response.epa.gov/WolffAlportRadSiteRV2. Accessed November 29, 2023.

11 Joseph Masco, *The Future of Fallout, and Other Episodes in Radioactive World-Making* (Durham, NC: Duke University Press, 2021).

12 Jennifer Gabrys, "Sink: The Dirt of Systems," *Environment and Planning D: Society and Space* 27, no. 4 (1 August 2009): 666 –81.

13 Carmella Gray-Cosgrove, Max Liboiron, and Josh Lepawsky, "The Challenges of Temporality to Depollution & Remediation," *S.A.P.I.E.N.S. Surveys and Perspectives Integrating Environment and Society*, no. 8.1 (26 November 2015).

14 Rob Nixon, *Slow Violence and the Environmentalism of the Poor* (Cambridge, MA: Harvard University Press, 2013), 2.

15 Joseph Masco, "Nuclear Technoaesthetics: Sensory Politics from Trinity to the Virtual Bomb in Los Alamos," *American Ethnologist* 31, no. 3 (August 2004): 349 –73.

16 Ibid., 351.

17 Nate Lavey, "The Most Radioactive Place in New York," *New Yorker* video, 14:25, May 8, 2014. https://www.newyorker.com/video/watch/the-most-radioactive-place-in-new-york-city. Accessed November 29, 2023.

18 United States Nuclear Regulatory Committee, "Biological Effects of Radiation," *Backgrounder,* March 2017. https://www.nrc.gov/docs/ML0333/ML033390088.pdf. Accessed November 29, 2023.

19 Kathryn Yusoff, *A Billion Black Anthropocenes or None* (Minneapolis: University of

Minnesota Press, 2018).

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