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‘We don’t wanna be radiated:’

Documentary Film and the Evolving Rhetoric of Nuclear Energy Activism

In late March of 2011, the most powerful earthquake in Japan’s recorded history struck the country’s northern coast, triggering a tsunami that destroyed entire villages and killed over ten thousand people. The earthquake and tsunami also disabled the cooling systems of one of Japan’s larger nuclear power plants, Fukushima Daiichi. Despite the heroic efforts of Fukushima’s workers and assistance from a global group of experts, three of the plant’s six reactors reached a state of partial meltdown and radioactive material leaked into the air, the ground, and the Pacific Ocean. As the disaster unfolded, international concern over the nuclear crisis eclipsed concern over the catastrophic effects of the earthquake itself. Fears of global nuclear contamination spurred sales of potassium iodide in Russia, China, and the United States. Eventually, Fukushima’s troubles sparked anti-nuclear protests in Europe, Asia and South Asia, and caused the shutdown and re-inspection of older nuclear plants in Europe and North America.

Occurring only weeks before the twenty-fifth anniversary of the Chernobyl nuclear disaster, Fukushima overturned the conventional wisdom that large-scale nuclear accidents like Chernobyl are no longer possible, and engendered a heated debate about the future of nuclear power. One of the more notable aspects of this debate — especially given that the environmental effects of Fukushima was still being assessed — was that some of the harshest defenders of

nuclear power in the wake of Fukushima were environmentalists. Four days into the Fukushima crisis, well before the plant's meltdown had been controlled, GAIA theorist James Lovelock told the British newspaper The Guardian that he hoped Fukushima would not “prejudice” people against nuclear energy.ⁱ A week later, British environmentalist and global warming alarmist George Monbiot wrote — also in The Guardian— that “Fukushima made me stop worrying and love nuclear power.”ⁱⁱ In an interview with Foreign Policy Magazine the next day, Whole Earth Catalog author Stewart Brand described Fukushima as a “learning experience” that had not altered his enthusiasm for nuclear energy.ⁱⁱⁱ

Though Monbiot, Brand and Lovelock's defense of nuclear energy might seem surprising, their remarks reflect the enthusiasm with which many in the environmental movement have embraced the idea of nuclear power. Over the past ten years, the rhetoric of “green nukes” has been steadily advancing. The idea that nuclear power is the only environmentally sensible energy option has been articulated in publications including The New York Times, Wired Magazine, and The Washington Post,^{iv} endorsed by environmental advocates including Patrick Moore, Christie Whitman, Brand, Lovelock, and Monbiot — and, not least, promoted by the industry itself, through slogans such as “go nuclear because you care about the air.”^v In tandem with industry assurances of the safety of a new generation of nuclear reactors, the greening of nuclear energy revived the long-dormant nuclear industry to the point where advocates claimed that the U.S. was undergoing ‘nuclear renaissance.’ For U.S. environmentalists who oppose about nuclear power, this transformation of the industry's image has left little ground to stage an opposition.^{vi}

Brand and other pro-nuclear environmentalists explain their turn towards the nuclear in starkly simple terms: as global warming has become the *prima facie* paradigm of planetary

extinction, those concerned with the fate of the earth have embraced nuclear energy as the least harmful path toward a sustainable future. But the causal narrative here is reductive: while it is true that the rise of global warming rhetoric parallels the decline of the U.S. movement against nuclear power, the decline of this movement (which I label here the anti-reactor movement) cannot be explained merely with reference to global warming. To understand how anti-reactor environmentalists lost moral ground to the green nuclear movement requires exploring the history of the mutually empowering, yet conflicted relationship between U.S. environmentalism and the U.S. anti-reactor movement. In this post-Fukushima moment, when the debate over nuclear power reasserts itself in a new century, it is vitally important that we take a fresh look at that history.

In what follows, I attempt to unpack the divergence between the symbolic imaginary¹ of nuclear power and the imaginative terrain of environmentalism through a look at documentary film about the civilian nuclear industry. I first analyze several films about U.S. anti-reactor activism produced in the 1970s and 1980s, showing how they manifest the co-dependence of anti-reactor activism and environmentalism. I then turn to recent films that look more broadly at the industrial processes involved in nuclear power creation. Drawing on disparate strands of scholarly inquiry—including ecocriticism, documentary theory, and science studies—I read these newer documentaries to illuminate how changing political, material and economic realities have reshaped how opponents of nuclear energy imagine the relationship between body, place, and planet.

This reimagining, I suggest, is predicated on a complex global sensibility far more sophisticated than that embraced by past U.S. opponents of nuclear power. Produced outside of the U.S., but circulating as part of new global opposition to the nuclear power industry, these

newer films bring to mind what ecocritic Ursula Heise has described as “eco-cosmopolitanism” or “environmental world citizenship.”^{vii} In Sense of Place, Sense of Planet Heise argues that despite environmentalism’s globalist roots, an over-emphasis on the local has left U.S. environmentalists less able to consider the challenges of the contemporary world. She concludes, however, that recent narratives about climate change might serve as a corrective to this localism. I posit here that the films with which I conclude this essay might also serve as a model for cosmopolitan environmental discourse, and thus broaden the applicability of Heise’s revisionary critique into a reconsideration of environmentalism as represented in documentary film.

The primary intention of this essay is thus to expand the horizons of ecocriticism while also providing a fresh consideration of the relationship between environmentalism and the anti-reactor movement. That being said, it is my hope that this essay will serve to rescue several films from critical obscurity. While fiction films about nuclear warfare and nuclear power have been studied by media scholars and ‘nuclear critics,’^{viii} documentaries about the anti-nuclear movement have received little attention. This is in large part because they are classed as realist political documentaries, a film genre long ignored by the academy. In her essay “The Production of Outrage,” film scholar Jane Gaines notes that while film theory emerged in the same moment in which political documentary gained ground in the 1970s, political documentaries were seen as tied to outmoded concepts of documentary realism which rendered them unfit for scholarly attention.^{ix} The erasure was so complete that academic activists ignored the very films they produced and consumed in their political life in their work as critics and scholars.^x

Recently, however, the tide has shifted. New scholarship on political documentary focuses on how these films to try to create new political and social subjects through performative

and emotive strategies that cannot be accounted for in theoretical critiques of documentary realism. Exploring radiation-hazard documentaries through the lens of these insights, I focus on the way they reflect the contemporary sensibility of the movement that engenders them while also rhetorically constructing the subjects of anti-reactor activism. My emphasis here is on is thus not on affirming the claims these films might make about the consequences of nuclear power; instead I look at how these claims are deployed in order to motivate political action.^{xi}

Filming The First Wave of Nuclear Power Activism

Although protests against nuclear power plants occurred as far back as the 1950s,^{xii} sustained public debate over the potential dangers of nuclear power emerged only in the 1970s, gaining ground after the 1973 energy crisis spurred a broad expansion in nuclear power facilities. Responding to what seemed like unfettered plans for growth, local and national groups — including Critical Mass, Friends of the Earth, The Sierra Club, The Union For Concerned Scientists, Physicians For Social Responsibility and Mobilization for Survival — began advocacy campaigns that drew attention to the possible hazards that might result from the everyday functioning of nuclear plants and the potential for catastrophic accidents.

The movement's first important symbol of resistance emerged in February of 1974, when Samuel Lovejoy, an organic farmer in Montague, Massachusetts, knocked over a wind tower sited at a prospective nuclear power plant on the outskirts of town. The highly publicized trial that followed made Lovejoy a hero among those opposed to nuclear energy. Afterwards, Lovejoy himself became a committed opponent of nuclear power, helping to assemble a coalition of anti-nuclear activists calling itself the Clamshell Alliance. In 1977, the Clamshell Alliance initiated what would become a series of mass protest actions against utilities attempting to build

nuclear plants, occupying the future site of a nuclear reactor in Seabrook, New Hampshire. This incident, which resulted in 1,400 arrests, inspired similar groups in other regions, including the Catfish Alliance in Alabama, the Oystershell Alliance in New Orleans, the Cactus Alliance in Utah and Arizona, the Red Clover Alliance in Vermont, the Palmetto Alliance in South Carolina, the Abalone Alliance in California, and the Crabshell Alliance in Seattle.

Legal and illegal protest against nuclear power plants continued into the 1980s, though the turn of the decade marked a climax point. In 1979, after the partial core meltdown at the Three Mile Island plant — and the coincidental release of the anti-nuclear film The China Syndrome, which portrayed a fictional reactor meltdown of far greater consequence — the movement reached peak membership, attracting broad national support across political parties, generation, and social classes. But even as interest in the issue surged, a significant number of anti-reactor activists began shifting their focus, embracing a rapidly-growing nuclear freeze movement that soon overshadowed protests against nuclear power. Beginning in the early 1980s, the primary conversation about nuclear hazard in the United States changed from one about the effects of radiation from nuclear power plants to one about the imminence of nuclear war. Eventually, the freeze movement achieved a broader base of support; while a New York City concert against nuclear energy held in the months after Three Mile Island attracted between 100,000 and 200,000 attendees, setting a record for US nuclear power protest, a 1982 disarmament rally (also in New York) was attended by about one million people. After the Chernobyl disaster in 1986, international outcry about the hazards of nuclear power effectively halted the expansion of the nuclear industry in countries where anti-reactor activism remained strongest, making the movement yet more marginal. By the late 1980s, U.S. anti-reactor activism

dwindled into insignificance, followed shortly afterwards by the death of the nuclear freeze movement as the Cold War came to a close.

This brief history of anti-reactor activism, while it cannot do justice to the complexity of its multiple actors, should suggest why the broad-based movement was an appealing topic for documentary film. The first film to emerge on the topic of nuclear power activism, Lovejoy's Nuclear War (1975) focuses on Sam Lovejoy's act of civil disobedience and ensuing court trial.^{xiii} The Last Resort (1978) documents the growth of the movement in New England, focusing on protests around the Seabrook nuclear power plant in New Hampshire.^{xiv} Paul Jacobs And The Nuclear Gang (1979) draws parallels between radiation hazards from nuclear testing and radiation hazards from power plants.^{xv} We Are The Guinea Pigs (1980), filmed after the partial core meltdown at the Three Mile Island nuclear power plant, warns of the future consequences of the accident.^{xvi} Dark Circle (1982) weaves together concerns about nuclear weapons with concerns about nuclear energy, moving from the Rocky Flats nuclear weapons facility to the Diablo Canyon nuclear power plant, then to Hiroshima and Nagasaki.^{xvii} And A Question of Power (1985) centers on the long and ultimately unsuccessful struggle to block the construction and licensing of the Diablo Canyon nuclear power plant.^{xviii}

Though they depict different moments in the history of the anti-reactor movement, these documentaries have similar goals and tactics. All are what documentary scholar Patricia Aufderheide has labeled "advocacy films"^{xix} (78), films whose primary intent is to provoke audiences to political action. To this end, they frequently employ a strategy Gaines has described as "political mimesis,"^{xx} or the process of modeling political action onscreen that audiences can reproduce offscreen. In the case of anti-reactor documentaries, this means that these films — to a varying extent — include long scenes of civil disobedience training sessions,

marches, rallies, street performances, and sit-ins. Though these scenes (usually accompanied by earnest folk ballads) might seem excessive or protracted to modern audiences, their purpose was both to recruit activists to the movement and to provide them with a template for reproducing the actions of fellow activists around the U.S.^{xxi}

For films about anti-reactor activism in the 1970s and 1980s, scenes of civil disobedience also served a second purpose: that of countering contemporary media portrayals of nuclear power activists. As William Gamson has noted, the mainstream media tended to portray such activists as uninformed rabble-rousers or “demonstrators in search of a cause.”^{xxii} In contrast, these films are careful to emphasize the preexisting beliefs that motivate action, through scenes in which ordinary-seeming citizens explain their path towards activism. For example, A Question of Power features numerous interviews detailing the motivations and strategies of citizen-activists, including one with a man identified as “Clark Kluver, cabinetmaker.” Seated with his wife in their semi-rural yard, Kluver and his wife describe the sense of betrayal they felt when they learned that the proposed nuclear plant sited near their home had possible safety issues, and Kluver adds that “it’s our duty as citizens to oppose and protest what we believe is dangerous and unresolved technology.”

These scenes of articulating belief are as at least as important to anti-reactor documentaries as the scenes of protest activity they justify. Didactic rather than performative, they offer claims grounded in emotional logic intended both to move audiences to action and to serve as “talking points” for further anti-reactor activism. In his book Intelligence Work: The Politics of American Documentary, Jonathan Kahana has described this form of documentary extrapolation as “intelligence work,”^{xxiii} or the strategy of disseminating political and social truths in order to create informed citizens who will further circulate these truths through political

and social engagement. As Kahana explains, audiences are intended to see what transpires in the film as both historic event and blueprint for future action: “an audience comes to understand itself as an agent of change when it figures out how to generalize from the case on screen to other situations or cases.”^{xxiv}

As with many of the films Kahana cites in his own work, these anti-nuclear documentaries rely on expert testimony in order to make knowledge claims; here, to identify the health risks of radiation. They use scientists (some of whom became public figures during the 1970s and 1980s, like Michio Kaku and Helen Caldicott) to lend gravity to their claims. In doing so, the films capitalize on a changing relationship between scientists and the public during the time. Kelly Moore notes in Disrupting Science that by the 1970s scientists were increasingly publicizing debates about issues that had previously occurred entirely within the scientific community; the somatic effects of radiation was one such focus of controversy.^{xxv} By openly debating radiation’s health effects, these scientists moved the public conversation about nuclear energy away from purely emotional responses to a conversation about scientific evidence, creating a debate that persisted in the face of media indifference and official challenges.^{xxvi}

At the same time, however, the use of expert testimony in these films tends to support only one side of the nuclear power debate — what documentary scholar John Conner has called a “singular sense of truth” about the issue.^{xxvii} Though in some cases industry officials who voice a pro-nuclear-power position are given space within the films’ diegetic structure, their arguments are simply not granted as much authority — whether expert authority or moral authority — as the claims of scientists and activists. For example, in We Are The Guinea Pigs, Richard Vollmer, the director of the Three Mile Island NRC task force, explains in an interview that reports of farm animals becoming ill in the wake of the Three Mile Island incident had been

investigated by scientists and “found to be the result of viruses, not radiation.” Undermining Vollmer’s stance as an impartial ‘expert,’ the filmmakers position him against a backdrop of nuclear cooling towers, suggesting his affinity with the industry. Directly before and after Vollmer’s interview, scenes featuring farm families challenge Vollmer’s explanation, as the families detail the death and stillbirth of livestock and their own illnesses in the immediate aftermath of the partial meltdown.

This sequence, as well as other incidents of grudging or subtly compromised inclusion of pro-nuclear perspectives, signals that those who produced anti-reactor documentaries had no interest in remaining neutral on the issue of nuclear power. In consequence, the films and their producers sometimes found themselves in the crosshairs of the U.S. energy industry when an attempt was made to show them to a mass audience. In The Sponsor: Notes On A Modern Potentate, Eric Barnouw notes that energy companies were frequent sponsors of both public and commercial television networks, and used their role to exert direct influence over the media representation of nuclear power.^{xxviii} This influence — coupled with the resistance of television stations to show documentaries that did not “tell both sides of a story” — meant that anti-reactor films were a tough sell for public or network television, a primary market for the distribution of documentary at the time.^{xxix} Instead, they were mainly shown at festivals, at universities, and in activist settings.

Still, given the general quiescence of the 1970s media with regards to nuclear energy,^{xxx} it was precisely these films’ position outside of the mainstream media that made them valuable. Emphasizing the perils of nuclear energy over its potential benefits, they provided — as Pat Auferheide has suggested of advocacy documentaries generally^{xxxi} — a crucial intervention into public debate, providing an oppositional viewpoint that was otherwise absent from public view.

As part of their struggle for visibility in the face of media indifference, these films also helped to publicize and solidify the connection between nuclear power activism and the 1970s environmental movement, strengthening both causes by yoking them together through imagery and editing.

Nuclear Power Activists As Environmentalists

One need only consider the names of the groups which came together to protest the emergence of the nuclear power industry — Clamshell, Clover, Abalone — to understand the strength of the connection between the emerging anti-reactor movement and the burgeoning US environmental movement. As historian Elizabeth Watkins has argued, environmentalism's role in the anti-reactor movement was not merely ally, but midwife.^{xxxii} The groundswell of interest in the environment engendered by the publication of Rachel Carson's Silent Spring gave 1970s activists a potent symbolic vocabulary to draw widespread attention to the effects of radiation on the natural landscape.^{xxxiii} Equally appealing to anti-reactor advocates was the rapid rise in popularity of environmental activism — in part due to the movement's borrowing of tactics from civil rights activists^{xxxiv} — especially when compared to the limited success of earlier anti-nuclear activism. As Watkins notes, protest against domestic nuclear testing in the 1950s and 1960s had run aground in the face of Cold War arguments about the need for a nuclear arsenal. Fearing that their movement might be likewise be weakened by too much emphasis on nuclear weapons, 1970s opponents of nuclear power downplayed any connection to disarmament, emphasizing instead the idea of radiation as an environmental hazard. In turn, the environmental movement, initially more preoccupied with the dangers of fossil fuels, increasingly turned its attention to nuclear issues. As the anti-reactor movement gained ground, the association

between the two groups developed to the point where some activists within the anti-reactor movement saw themselves as equally, even primarily, environmentalists.^{xxxv}

It would be reductive to claim that environmentalism alone was the impetus behind the movement against nuclear power in the United States. Lawrence Wittner's account of the movement in his history of the disarmament movement, Toward Nuclear Abolition,^{xxxvi} rightfully points to the core of anxiety about nuclear weaponry that informed fears about nuclear energy. Yet this underlying fear also served to strengthen the interdependence between environmentalism and anti-reactor activism, as the specter of the bomb lent a certain gravitas and urgency to environmentalism. This conflation of anxieties plays out by the opening montage of the first U.S. television series about environmentalism, Our Vanishing Wilderness.^{xxxvii} a clip of a nuclear blast is followed by shots of nuclear cooling towers, shots of wilderness areas, and finally shots of cities and jet planes, all accompanied by a dissonant electronic score intended to convey a sense of urgency.^{xxxviii}

Using a similar visual language of threatened nature, anti-reactor documentaries foreground the possible environmental consequences of radiation from their opening credits onwards, beginning with images of either wild or pastoral settings supposedly endangered by nuclear power production. For example, Sam Lovejoy's Nuclear War opens with panoramic shots of Vermont farmland, then shifts to Lovejoy sitting in the middle of his field talking how he became an organic farmer. The Last Resort opens with shots of undeveloped Vermont marshland. Dark Circle begins with a shot of migrating birds in an uninhabited landscape, and a voiceover reminding us that plutonium has upset the "unbroken pathway" of evolution. A Question of Power begins with a series of vista shots of the Northern California coastal landscape: as gulls and otters feed offshore and cows graze in oceanside pastures, the narrator

explains that his film is “the story of the Diablo Canyon controversy, and the anti-nuclear movement in California.”

Resonant with the visual language of environmentalism during the period, these images of American landscapes work to visually suture anti-reactor documentaries to the environmental movement. All are what Andrew Ross has described as the by-now familiar “images of ecology,” including “the redeeming repertoire of pastoral imagery, pristine, green and unspoiled by human habitation.”^{xxxix} Scenes of pristine wilderness become in these films a symbol of fragility, and of immanent loss or decline in the face of environmental hazard. And pastoral scenes of farm animals and fields point to the responsible husbandry that nuclear power threatens to disrupt, emphasizing the interdependence between humans and the natural world.

This interdependent relationship is particularly explicit in the opening montage of We Are The Guinea Pigs, a 1980 documentary produced in the months following the Three Mile Island accident. Like other anti-reactor documentaries, it begins with an emphasis on the natural landscape: here, however, shots of farmland are dominated by the massive cooling towers of the Harrisburg plant, which overshadow barns and fields. The montage intersperses these landscape images with medium shots of townspeople enjoying what appears to be a normal day in the environs of Three Mile Island, including farmers at work and children swimming in the Susquehanna River. The implication of the opening sequence is that this landscape — as well as the townspeople who inhabit it — might already have been affected by the partial meltdown at Three Mile Island. To drive the point home, the camera lingers on the bodies of these possible victims (and the belly of a pregnant woman) as a rock ballad about the disaster performed by The Fourth Wall Reparatory Company plays in the background: “take a look at Harrisburg/pretty

soon we'll see how bad they got hurt/they're gonna try and cover up the dirt/but those people got radiated.”

The opening segment of We Are The Guinea Pigs exemplifies the manner in which all of these anti-reactor documentaries negotiate between environmental claims and claims about the human health effects of radiation. Though the premise of environmental catastrophe is used to create a shared sense of moral urgency between the film and the viewer, these films ultimately ground their rationale for activism not in concerns for the nature that they so prominently feature, but in concerns for the potential human victims of radiation — especially existing and unborn children. In Sam Lovejoy's Nuclear War, though much is made of Sam Lovejoy's love of the land, Lovejoy explains that his act of civil disobedience is motivated by “my love of a four-year-old-girl” (his daughter). In A Question of Power, a woman narrates her passage into activism, pausing to weep when she says that in the wake of a nuclear accident she would need to “kiss her children goodbye.” In We Are The Guinea Pigs, a father tells a similar story of his coming into being as an activist, weeping as he describes his daughter's death from leukemia and remarking that “a child's life should never be put second in order to put a light switch on.”

This move from concern for nature to concern for the health of actual or potential “radiated bodies” can be seen as the extension of environmental logic into health activism — a rhetorical strategy both Ursula Heise and Laurence Buell have characterized as ‘toxic discourse.’^{xl} Buell describes toxic discourse as “expressed anxiety from perceived threat of environmental hazard due to chemical modification by human agency,” (31) and Heise suggests it is “a crucial trope by which writers and filmmakers explore the porous boundaries between body and environment, public and domestic space, and harmful and beneficial technologies.”^{xli} Much like Rachel Carson's Silent Spring — which Heise and Buell see as a key text in

establishing a shared language for contemporary toxic discourse — these films immerse their audiences in nature, then assert that what seems on surface to be pristine or pastoral is actually (as Buell notes) a “betrayed Eden” which threatens their health and the health of their children. Such language might seem pessimistic and disabling, but Heise and Buell, who both draw on the work of sociologist Ulrich Beck, see toxic discourse as potential source of activist identity-formation. Buell claims that “evidence accumulates of the emergences of toxicity as a widely shared paradigm of cultural self-identification...evidence too that the eloquence of testimony of ordinary citizen’s anxiety about environmental degradation can have influence on public policy, especially when the media are watching...”^{xlii}

If Buell and Heise help to explain the rhetorical strategies of anti-reactor films, the work of anthropologist Anna Petryna is similarly useful for understands how anti-reactor documentaries extend their biological anxieties into the policy arena. Fostering a shared social identity around health concerns, anti-reactor documentaries redefine the ethical obligations of the state in accordance with what Petryna has described as the concept of ‘biological citizenship.’ In her study of the efforts of Ukranian Chernobyl victims to obtain assistance, Petryna notes that radiation sickness brought about a redefinition of self among victims, in which “the damaged biology of a population [became] the grounds for social membership and the basis for staking citizenship claims.”^{xliii} As biological citizens, Petryna argues, Ukrainians used claims of radiation exposure in order to access the limited resources of that country’s social welfare system, reconfiguring the nation into exposed and unexposed citizens with different demands on the state.

There is an obvious difference between what transpires in these documentaries and what transpires in Petryna’s study of biological citizenship; most U.S. films about anti-reactor

advocacy focus on the idea of possible injury, rather than on the remediation of such injury. But, just as in Petryna's example, there is also a clear sense in these earlier films that those who live near nuclear plants must recognize the potential or real harm caused by such plants and build new political and social alliances based on this shared possibility of damage. Anti-reactor documentaries thus deploy a sophisticated representational politics, drawing on toxic discourse to link health concerns to a vision of betrayed nature, and developing a notion of biological citizenship to insist on the right of citizens to be free from nuclear threat. This progression is evoked by the opening ballad of We Are The Guinea Pigs, which, after describing the incident at Three Mile Island, urges the film's viewers to tell the Pentagon "we don't wanna be radiated."

These films suggest, then, that environmentalism provided anti-reactor activism with visual language, a moral and ideological framework, even the basis for a discourse of rights. Yet they also point to a fatal limitation of both movements: their reliance on what Heise describes as the self-defeating regionalist strain of U.S. environmental thinking. Despite claims for the pervasive nature of radiation damage, anti-reactor documentaries concern themselves primarily with the threat reactors pose to those adjacent to the sites of protest they document: radiation is figured as the unseen danger haunting bucolic American landscapes populated mostly with white, middle-class townspeople and the occasional enlightened blue-collar plant worker. In doing so, they indicate the limits of the movement's understanding of the possible victims of nuclear radiation. Though the rural or small-town settings of these films are partly determined by the siting of nuclear plants, the resulting absence of urban spaces and demographic diversity limits the idea of "citizenship" that the films can develop.

Perhaps ever more problematically, the local focus of these documentaries — like the larger social movement they represent and reproduce — neglects an important part of the story

of nuclear power: the phenomenon of the economic globalization of the nuclear industry, including increasing worldwide uranium mining activity and the attempts of the nuclear power industry to broaden its presence in the developing world. The peripheral nature of such global concerns to the US movement against nuclear power is exemplified in a sequence towards the end of the documentary A Question of Power, in which the film affirms the role of activism in defeating the U.S. nuclear power industry during the 1980s. A voiceover chronicles the decline of the nuclear industry while, incongruously, we see a clip of footage from nuclear reactor construction in India during the 1970s. The narrator explains that “while over 100 nuclear power plants are currently being cancelled in the U.S., the nuclear power industry has turned to Third World Countries as a market.”

The implication here is that this relocation of the nuclear industry to the less-developed world is a victory for the US anti-reactor movement. Such a narrow view threatens to reduce the movement’s goals to nuclear nimbyism, demonstrating what Heinz (quoting John Tomilson) describes as an “ethics of proximity” that privileges local over the global. As one activist declares a few minutes later in the film, the anti-reactor movement had demonstrated the importance of “being true to your local roots.” The explicit celebration of the power of “local roots” in the film’s conclusion precisely echoes the “excessive investment in the local” that Heise identifies as a disabling move in U.S. environmental thinking. Blind to the ties — literal and moral — that bound nuclear India’s fate to the fate of Diablo protestors, A Question of Power can be read as a sign of the anti-reactor movement’s inability to take on nuclearism as a global phenomenon.

As well, U.S. anti-reactor activism carried out on the smaller scale reflected in these films faced a particular challenge tied to the history of U.S. citizen efforts to claim radiation-related

illness. While the post-Chernobyl radiation victims in Petryna's accounting were able to effectively mobilize against the state, U.S. citizens' assertions of illness or death caused by civilian or military nuclear activities have almost always been defeated by the counter-claims of the U.S. government.^{xliv} The emphasis on the local in the U.S. anti-reactor movement foreclosed the possibility of a more radical form of biological citizenship, one in which state-centered definitions of identity might have been challenged by a shared sense of damage extending not only across the United States, but internationally. Such a redefinition of biological citizenship has been proposed by the sociologists Nicholas Rose and Carlos Novas, who suggest that Petryna's notion of state-centered biological citizenship might give way to transnational alliances based on a "politics of embodied or somatic individuals,"^{xlv} in turn enabling activist movements to overcome government challenges to biological claims. Such alliances have been largely absent in U.S. anti-radiation activism, but a blueprint for a more cosmopolitan understanding of nuclear production can be found in the films I will now discuss.

Transnational Radiation Documentaries and Eco-Cosmopolitanism

I have argued that advocacy documentaries about the U.S. anti-reactor movement reveal the movement's historical flaw: activists localized what should have been, from the beginning, a global struggle, focusing on conditions of energy production in the US and ignoring the global networks of capital that facilitate the production of nuclear power. In doing so, the movement created a typology of representation incapable of reinventing itself once environmentalists turned their attention to a problem identified from the outset as global in scale — namely, climate change. Small wonder, then, that nuclear environmentalists were capable of wresting the

atrophied moral ground from a long-dormant U.S. anti-reactor movement, by positioning that resistance to nuclear power as a naïve and outmoded strain of environmental thinking.

However, some 25 years after the end of the anti-reactor movement, a new group of filmmakers have taken on the challenge of anti-nuclear activism, drawing on a different documentary sensibility. These new documentaries are not from the U.S.: they are also not exclusively (or even largely) about the safety of nuclear power plants. Rather, they are invested in exploring what communications scholar Danielle Endres has described as the oft-forgotten “front and back ends of nuclear power production,” namely, uranium mining and nuclear waste storage.^{xlvi} They do not reject the biologically-based arguments of earlier radiation films but augment them with broader political and economic insights. As in earlier films, the threat of radiation damage binds together a disparate assembly of actors; but the films are equally concerned with other networks: the networks of production, consumption and waste that comprise the nuclear-industrial complex.

The remainder of this article will focus on two Australian films, A Hard Rain (2007)^{xlvii} and Uranium: Is It A Country? (2008),^{xlviii} that reimagine the terrain of nuclear power activism in ways that mirror the strategies of re-mapping embraced by recent ecocritics.^{xlix} As they connect the ideology of “green nukes” to the rapid growth of uranium mining and nuclear waste storage in Australian aboriginal territory, these films also provide evidence of what has been described by Endres and others as nuclear colonialism, or the siting of nuclear mining and storage on lands disproportionately occupied by indigenous persons. In doing so, they shift away from the localist anti-reactor arguments of films such as A Question of Power, developing a more ethically and logically persuasive challenge to the green nuclear advocates.

A Hard Rain begins with veteran Australian filmmaker David Bradbury, the film’s

director and narrator, explaining that the threat of global warming has allowed “the nuclear monster [to] rear its ugly head” once again in Australia. Bradbury says he decided to make what became his third film about nuclear issues because he feared that Australians might be seduced by the idea of green nuclear power:

When the Prime Minister returned from a trip to the United States a sudden convert to the idea of nuclear power as a magic fix for climate change, my alarm bells started to ring. I grabbed my credit card, dusted down the old camera, kissed my kids goodbye and headed off around the world.

The resulting documentary chronicles how Australia, home to 40% of the world’s uranium resources, has become a key provider of uranium as well as an increasingly desirable location for storing the world’s nuclear waste material. Bradbury’s travels take him from Australia to France, the United Kingdom, China, and Japan, as [A Hard Rain](#) attempts to map the distribution of Australian uranium supplies while educating the viewer as to what uranium mining entails. The first half of the film focuses on Bradbury’s largely unsuccessful attempts to gain access to Australia’s rapidly expanding Olympic Dam mine, currently the world’s largest single source of uranium ore. After being told by a security guard he cannot film the entryway of Olympic Dam even while parked on a public road, Bradbury rents a plane in order to take aerial footage of the damaged landscape. He is similarly rebuffed in his efforts to interview officials from the mine’s corporate owners, BHP Billiton. Finally, he does interview the BHP Billiton-appointed “mayor” of Olympic Dam’s company mining town, Roxbury Downs. The mayor, not surprisingly, politely deflects Bradbury’s line of questioning, insisting the mine and its workers are safe.

To argue that Olympic Dam — or any uranium mine — poses a threat to humans and the environment, Bradbury relies a series of expert interviews, including British, Australian and

American conservation experts, engineers, and medical researchers. Early in the film, epidemiologist and former Nuclear Regulatory Commission consultant Rosalie Bertell explains that the nuclear industry's emphasis on "clean" nuclear energy refers only to what occurs in the reactor itself, and elides the "dirty" industrial processes, especially uranium mining, that go into the production of fuel for the reactor. Later, in a scene that draws heavily on the visual rhetoric of toxic discourse, an aerial shot of Australian outback is overlaid with a voiceover track in which Bertell describes the possible hazards of radon gas emissions from uranium mines. As Bertell explains that radon, an invisible gas with no odor, travels great distances from its point of release during its brief half-life, images of pristine Australian wilderness are intercut with those of sleeping children, the implied victims of radioactive discharge.

Here and elsewhere, A Hard Rain both rehearses and extends the arguments of earlier U.S. anti-reactor documentaries. As in the earlier films, Bradbury identifies a threat to a specific region, but in this instance Bradbury situates this threat in the global context of nuclear energy production. The forces driving uranium mining in Australian are not uniquely or even mainly Australian: business investment from the United States^l and the demand from Chinese, Japanese and European markets all factor in the uranium calculus. When Bradbury turns to the question of whether proposed Australian nuclear power facilities will be safe, he casts a wide net to find examples to support his argument of nuclear hazard, steering clear of the oft-traveled territory of Chernobyl and Three Mile Island to instead visit Japan's Monju nuclear processing plant and Britain's Sellafield plant, both also sites of past industrial accidents.

Stringing together Bradbury's multiple journeys, A Hard Rain foregrounds his role in the film as a cosmopolitan intellectual whose understanding is, in part, a function of his mobility and ability to synthesize a range of information and perspectives.^{li} Like earlier advocacy films about

nuclear energy's potential dangers, A Hard Rain is a call to action, but the action the film demands is primarily the further dissemination of the information it contains. A Hard Rain thus embodies the project of "intelligence work" suggested by Kahana, but also proposes a shift in the arena of political action for the potential anti-nuclear activist. If conventional means of protest are insufficient against global networks of causes and outcomes, A Hard Rain suggests that it is necessary for nuclear activists to strategize from a vantage point that reveals the entire pantheon of actors in the nuclear-industrial complex. And if, as Bertell explains at one point in the film, radiation from mines and nuclear plants "doesn't need a passport," than activism geared towards mitigating the effects of such radiation needs to discover a new geography of possibility as well.^{lii}

In A Hard Rain, this new geography manages to balance the long view with a persistent eye on the local: despite its emphasis on cosmopolitan understanding, A Hard Rain also acknowledges of importance of situated resistance in the struggle against uranium mining. Here, however, the players have shifted dramatically. In locations in which nuclear colonialism plays a role in the location of mines and waste disposal sites, resistance does not come from white, middle-class activists, but from indigenous populations whose prior claims to land in mining areas have been invalidated by the state. Scenes in A Hard Rain refer back to Bradbury's previous film, Jabiluka, which documents the Mirrar aboriginal people's successful attempt to block uranium mining on their land. But A Hard Rain does not have such a happy tale to tell: Bradbury interviews aboriginal Shane Wright about his concerns that the planned Olympic Dam expansion will result in the confiscation of ceremonial land. Wright describes the land as under threat both spiritually and environmentally; aside from the dangers of the radioactive tailing piles, the mine requires a significant amount of water to operate in an ecosystem that is already

water-deficient.

Significantly, Wright is the only ‘lay’ figure in the film to express concern about the Olympic Dam mine. Most of the other non-expert interviews are with mine workers; imported from elsewhere in Australia, and apparently reassured by BHP Billiton as to the safety of Olympic Dam project, they uniformly deny that the mine poses a threat to the environment, to themselves, or to the local indigenous populations. One worker notes that the “old blackfellas” (aboriginal elders) might object to the mine for religious reasons, but that younger aboriginals are “only interested in the coin,” and will accept the mine if it brings them profit. Though Wright himself acknowledges that among the Aboriginals “the dollar will win in the end,” it is clear that his understanding of the land’s value and purpose is radically different from that of the mine workers, a function of his lived experience and history in the outback.

This dynamic between situated understanding and cosmopolitan mobility is also at the heart of the documentary Uranium: Is It A Country?. The film’s title is drawn from a series of baffled replies given by European guests in an Australian youth hostel when they are asked what uranium is. The film suggests that their responses are not merely indicative of ignorance; rather, they are the answers given by young people with little reason to know or fear uranium, not least because their lives have never been overshadowed by any form of nuclear threat. Emphasizing the distances between the uranium mines of Australia and the supposedly “clean” nuclear facilities of Europe, Uranium: Is It A Country? posits that the popular acceptance of nuclear power as environmentally sensible might be connected to this new generation’s literal and cognitive distance from the production of nuclear artifacts. As the film’s subtitles note, the Olympic Dam mine is “22,100 km from Europe,” and the Adelaide container port (through which uranium passes on its way out of the country) is 21,500 miles away.

Like A Hard Rain, Uranium, Is It A Country? attempts to bridge the distance between nuclear reactors and uranium mining. In one extended scene, the film intercuts interviews with two men who have never met, yet who are linked by a shared belief in the dangers of uranium mining: Bruce Chareryon, director of a French NGO (CRIIRAD, or Commission de Recherche et d'Information Indépendantes sur la Radioactivité) specializing in the detection of environmental radioactivity, and Reg Dodd, an Arabanna elder who has been involved in negotiations with mining companies for decades. In the first interview, Chareryon sitting at his desk, describes the steps involved in the conversion of uranium ore into nuclear fuel rods; in the second, Dodd ‘mines’ the dusty soil of the outback with his hands in search of a root vegetable called bush onion. As Chareryon details how uranium ore is milled into yellowcake, then converted into a gas, then back into metal, then back into a powder, into the pellets that go into fuel rods, and finally into radioactive waste product, Dodd sifts through the clay soil and describes the rituals of the bush onion harvest that have been handed down through generations of aboriginals living in the region.

The sequence starkly illustrates two different and conflicting epistemologies: Dodd’s story is about sustainability and stewardship, while Chareryon describes the creation of an unsustainable system of destructive mining practices and unstable storage of radioactive waste. Dodd explains the differing ways of land management as a clash of cultures, noting that unlike aboriginal culture, “the Western society is about now rather than the long term; what we can do now, what we can hoard up now.” The juxtaposition of the two scenes is effective not because Dodd and Chareryon represent two opposite realities, but because the viewer understands that the nuclear industry has intertwined the two men’s lives in ways neither might have anticipated. Both, men, in very different ways, are drawing attention to the same problem, and by weaving

the two interviews together Uranium: Is It A Country? suggests the problem's vast scale, a geographic range that renders it immune to local resistance alone.

This sequence also draws attention to Dodd's level of understanding of his own implication in global events. Despite Dodd's limited geographic horizons — he says of the outback that he was “born here, lived here all my life, never left” — he has a sophisticated understanding of the larger political and economic forces that threaten what he describes as “God's country.” His awareness makes him an exemplar of what Ursula Heise describes as deterritorialized modern subjectivity, characterized by the fact that the “average daily life in the context of globality is shaped by structures, processes and products that originate elsewhere.”

In its twinned contemplation of the local and the global, Uranium: Is It A Country? overcomes the limited scale and perspective of earlier documentaries about anti-reactor advocacy. As well, the film's exploration of the global answers Heise's call for a new “eco-cosmopolitan” sensibility. Like the climate change narratives Heise discusses in the final chapter of *Sense of Place and A Sense of Planet*, the film provides a “detailed exploration of a local site that on close inspection turns out to be linked to the global in unexpected, sometimes unsettling, sometimes exhilarating ways.”^{liii} The representation of Dodd's outback — shaped by Dodd and his ancestors but also by the multinational corporation that would enlarge Olympic Dam, is precisely such a place. Mining the earth with his hands in a call-and-response to the Western logic of mining and disposal, Dodd also embodies the dynamic between “deterritorialization” and “reterritorialization” that Heise suggests is characteristic of a new kind of environmental logic: the former is needed to understand how the local is situated in the global, but the latter is required, at times, as an intervention to help prevent the local from being overtaken by the global.

By grounding the film in Dodd's situated standpoint, Uranium: Is It A Country? manages simultaneously to reveal the global networks of the nuclear industry and to pinpoint the specific bodies and locations this industry threatens. As Heise suggests of climate change narratives, the film can be thus seen as an "aesthetic template by means of which to convey the earth as a whole and the dual earths that are shaped by varying cultural contexts."^{liv}

Like A Hard Rain, Uranium Is It A Country? thus poses a new kind of challenge to the polemics of nuclearism. Without denying that global warming is indeed a globalized problem, both films suggest that the "green" nuclear energy is not the solution. Rather, they depict "green nukes" as a strategy that allows the first world to turn a blind eye towards the conditions of nuclear fuel production, while also allowing multinational corporations to re-package an industry with known environmental hazards as an environmental enterprise. Keenly aware of both place and planet, these films can serve as a template for imagining a new, internationally based movement that takes a clear-eyed view of the relation between body, environment and finance in the production of nuclear artifacts. As the cleanup of Fukushima continues and countries around the globe detect persistent traces of its radioactive outflow, that movement may indeed be in the making. Whether its redefined goals might include the end of nuclear energy — or simply the end of the greenwashing that hides its true costs — remains to be seen.

ⁱ John Vidal and Fiona Harvey, "Japan Nuclear Crisis Prompts Surging Investor Confidence in Renewables," March 15, 2011.

ⁱⁱ George Monbiot, "How Fukushima Made Me Stop Worrying And Love Nuclear Power," Guardian.co.uk, Monday, March 21, 2011.

ⁱⁱⁱ Homans, Charles, "Nuclear Winner," Foreign Policy, March 22, 2011.

^{iv} Matthew L. Wald, “Edging Back to Nuclear Power,” The New York Times, 21 April 2010;

Patrick Moore, “Going Nuclear: A Green Makes The Case,” The Washington Post, Sunday, 16 April, 2006; Peter Schwartz, “Nuclear Now,” Wired, February 2005.

^v Quoted in Jon Gertner, “Atomic Balm?” The New York Times, 16 July 2006.

^{vi} Countdown To Zero sidesteps a central aspect of today’s nuclear-industrial complex: namely, the return of the nuclear power plant as a component of the national energy strategy in the United States and elsewhere. Aside from a brief discussion of Iran’s controversial use of nuclear power technology, the film shies away from a discussion of the risks posed by nuclear power plants, including their possible vulnerability to terrorist attack.

^{vii} Ursula K Heise, Sense of Place and Sense of Planet - The Environmental Imagination of the Global (New York: Oxford Univ. Press, 2008), 10.

^{viii} The rise and fall of nuclear criticism is a subject deserving of its own article; beginning in the mid-eighties as a high-theory movement encapsulated by Derrida’s designation of nuclear weapons as “fabulously textual,” nuclear criticism was declare obsolete by some of its chief proponents after the demise of the Cold War (See Paul Brians, Nuclear Texts and Contexts, vol. 8 (1992): 1-2 and Bryan C. Taylor, “Nuclear Weapons and Communications Studies,” Critical Studies in Media Communication 20.1 (2003): 1.). During its heyday, the movement sought “to differentiate itself from abundant past efforts to describe nuclear scenarios” (Daniel Cordle, “Cultures of Terror: Nuclear Criticism During and Since the Cold War,” Literature Compass 3.6 (2006): 1186-1199.). However, a number of nuclear critics did choose to focus on the representation of nuclear warfare in film and fiction. Since the demise of nuclear criticism, scholars including Cordle have called for a new, broader notion of nuclear criticism that looks both civilian and military nuclear technologies; my own efforts can be seen in this light.

^{ix} Jane Gaines, "The Production of Outrage: The Iraq War and the Radical Documentary Tradition," Framework: The Journal of Cinema and Media 48.2 (2007): 36-55.

^x See Alexandra Juhasz, "They Said We Were Trying to Show Reality: All I Want to Show is My Video: The Politics of the Realist Feminist Documentary," Collecting Visible Evidence, ed. Jane Gaines and Michael Renov (Minneapolis: Univ. of Minnesota Press, 1999.). Film scholar Charles Musser has likewise noted this indifference towards realist documentary was related to the high-theoretical turn of first-wave film studies: "during the 1970s and 1980s, critics, making use of Althusser, deconstruction, and postmodernism, savaged the application of truth value to documentary theory and practice." (Charles Musser, "Film Truth In The Age of George W. Bush," Framework: The Journal of Cinema and Media 48.2 (2007) 9-35.). Finally, Pat Auferheide and Matthew Nisbet argue that social documentary was also largely overlooked by social scientists until recently, thus relegated to a truly marginal position in the academy. They have recently advocated for the importance of social-movement documentary as a new field of inquiry for communications scholars (Matthew C. Nisbet; Patricia Aufderheide, "Documentary Film: Towards a Research Agenda on Forms, Functions, and Impacts," Mass Communication & Society 12:4 (Oct-Dec 2009) 450-456.).

^{xi} For a discussion of the "textual nature" of documentary realism and the bracketing out of truth claims, see Bill Nichols, Representing Reality. Bloomington, U of Indiana Press, 1991, p 179.

^{xii} The first US grass-roots opposition to a nuclear plant occurred in 1956 over the construction of the Enrico Fermi Experimental Fast Breeder Reactor at Lagoona Beach, MI. For a longer discussion of early responses to nuclear power, see Spencer Weart, Nuclear Fear.

^{xiii} Lovejoy's Nuclear War. Dir. Daniel Keller. Green Mountain Post Films, 1975. Film.

^{xiv} The Last Resort. Prod. Daniel Keller; Charles Light, Green Mountain Post Films, 1978. Film.

^{xv} Paul Jacobs and the Nuclear Gang. Prod. Jack Willis and Center for Documentary Media. Round World Media, 2005. Film.

^{xvi} We Are the Guinea Pigs. Dir. Joan Harvey. Parallel Films, 1980. Film.

^{xvii} Dark Circle. Dir. Chris Beaver and Independent Documentary Group. Docurama and New Video Group, 2006. Film.

^{xviii} A Question of Power. Dir. David Brown. David Brown Films, 1985. Film.

^{xix} Patricia Aufderheide, Documentary Film: A Very Short Introduction (New York: Oxford Univ. Press), 78.

^{xx} Jane Gaines, “Political Mimesis” Collecting Visible Evidence, ed. Jane Gaines; Michael Renov (Minneapolis: Univ. of Minnesota Press, 1999).

^{xxi} It is important also to see the heyday of the anti nuclear power movement as particular moment within the environmental movement, a moment in which many environmentalists became disenchanted with lobbying and interest group politics and turned to mass social protest. Indeed, as Martin Hajer as noted, the decline of the movement against nuclear power mirrored the decline of mass protest in general in the American environmental movement. (93). By the mid-1990s, the locus of mass social protest was not the environmental movement, or the movement against nuclear energy, but the nuclear freeze movement.

^{xxii} William Gamson, Talking Politics (New York: Cambridge Univ. Press, 1992), 18.

^{xxiii} Jonathan Kahana, Intelligence Work: The Politics of American Documentary (New York: Columbia Univ. Press, 2008), 14.

^{xxiv} Jonathan Kahana, Intelligence Work: The Politics of American Documentary (New York: Columbia Univ. Press, 2008), 24.

^{xxv} Kelly Moore, Disrupting Science: Social Movements, American Scientists, and the Politics of

the Military, 1945-1975 (Princeton: Princeton Univ. Press, 2008), 15.

^{xxvi} Brian Balogh explains how scientists, in tandem with the public, created an “issue network that “activated what otherwise might have remained an unstable set of conditions” and kept nuclear power activism afloat. Brian Balogh, Chain reaction: expert debate and public participation in American commercial nuclear power, 1945-1975 (Boston: Cambridge Univ. Press, 1991), 278.

^{xxvii} John Corner, "Documenting the political: some issues," Studies in Documentary Film 3.2 (2009): 113-129.

^{xxviii} Erik Barnouw, The Sponsor: Notes On A Modern Potentate (New York: Oxford Univ. Press, 1979), 158.

^{xxix} In fact, one of the earliest anti-reactor documentaries — Robert Widener’s The Powers That Be — served as a cautionary tale for movement filmmakers. After The Powers That Be aired on an NBC affiliate on May of 1971, PG&E complained that the film overdubbed part of a conversation with a plant engineer to give a misleading impression, and used this example to discredit Widener’s then-sterling reputation for the industry. Widener eventually sued PG&E for libel, and, after a 5-year battle, won what was at the time the largest libel settlement in history – but by that time, his career as a filmmaker had been ruined. Similar struggles surrounded Paul Jacobs and the Nuclear Gang, accused by detractors of being a “vile tear jerker,” and Dark Circle, which was held back by PBS and shown only after the film won an Academy Award. See B.J. Bullert, Public Television: Politics and the Battle Over Documentary Film. New Brunswick: Rutgers University Press, 1997.

^{xxx} The lack of interest in the nuclear energy issue in the media became itself a topic of media interest in the period after the Three Mile Island incident. A Los Angeles Time article about the

poor coverage of nuclear energy cited a study by The Media Institute, identified as “a business-funded research group,” which claimed “the three TV networks allotted nuclear news just one-quarter of one percent of the time available for news on their evening newscasts between August 1968 and March 27, 1979, the day before the TMI accident.” The reporter concluded that “the press’ generally uncritical coverage of nuclear power until Three Mile Island stemmed mainly from overreliance on, and excessive credence in, government and industry sources of information.” (Kent MacDougall, “Media Cast Largely Uncritical Eye On Nuclear Power Industry Until Three Mile Island,” Los Angeles Times, 6 February 1980, sec. E.). For more discussion of the media’s characterization of nuclear protest, see Mark Hertsgaard, On Bended Knee: The Press and The Reagan Presidency, Farar Strauss and Giroux, 1988.

^{xxxix} Patricia Aufderheide, Documentary Film: A Very Short Introduction (Oxford;New York: Oxford Univ. Press, 2007), 31.

^{xxxix} Elizabeth Watkins in Science, History and Social Activism: A Tribute to Everett Mendelsohn, ed. Garland Allen; Roy MacLeod (New York: Springer, 2001), 291-306.

^{xxxix} To further complicate this connection, Priscilla Coit Murphy notes in What A Book Can Do: The Production and Reception of Silent Spring that Rachel Carson’s editor at Houghton Mifflin promoted Silent Spring as a book that would be popular among readers already concerned about risks of nuclear fallout (Priscilla Coit Murphy, What a Book Can Do: The Publication and Reception of Silent Spring (Univ. of Massachusetts Press, 2007).

^{xxxix} Allan M. Winker, Life Under a Cloud, U of Illinois Press, 1999. P 160.

^{xxxix} In “Talking Atoms: Anti Nuclear Protest at Diablo Canyon, California, 1977-1984,” John Wills claims that some anti-nuclear activists he interviewed eventually moved out of the movement into ‘purer’ and less anthropocentric environmental activism. (John Wills, “Talking

Atoms: Anti-Nuclear Protest at Diablo Canyon, California, 1977-1984,” Oral History 28.2 (2000): 44-53.

^{xxxvi} Lawrence S. Wittner, Toward Nuclear Abolition: A History of the World Nuclear Disarmament Movement, 1971-Present, 1st ed. (Stanford: Stanford Univ. Press, 2003), 25-32.

^{xxxvii} Our Vanishing Wilderness. National Educational Television, 1969. Television.

^{xxxviii} Spencer Weart also discusses the connection between bomb anxiety and environmental apocalypticism in Nuclear Fear (Harvard U Press, 1988), 297.

^{xxxix} Andrew Ross, The Chicago Gangster Theory of Life. New York: Verso, 1995, 171.

^{xl} Lawrence Buell, Writing For An Endangered World (Cambridge: Harvard Univ. Press, 2001), 31.

^{xli} Ursula Heise, Sense of Place and Sense of Planet (Oxford Univ. Press, 1998), 161.

^{xlii} Buell, Writing For An Endangered World, 53.

^{xliii} Anna Petryna, Life Exposed: Biological Citizens After Chernobyl (Princeton: Princeton Univ. Press, 2002), 5.

^{xliv} Bryan Taylor, “Shooting Downwind: Depicting the Radiated Body in Epidemiology and Documentary Photography, in Transgressing Discourses, eds Michael Huspek and Gary Radford (Albany: Suny Press, 1997), 295.

^{xlv} Nikolas Rose and Carlos Novas, “Biological Citizenship,” in Global Assemblages: Technology Politics and Ethics as Anthropological Problems, ed. Aihwa Ong and Stephen Collier (New York: Blackwell, 2004), 439-463

^{xlvi} Danielle Endres, “From Wasteland to waste site: the role of discourse in nuclear power’s environmental injustices,” Local Environment 14.10 (2009): 917-937.

^{xlvii} David Bradbury, A Hard Rain. Frontline Films, 2007. Film.

^{xlviii} Stephanie Auth, Isabel Huber, and Kerstin Schnatz, Urainium: Is It A Country? Initiative Strahlendes Klima, 2008. Film

^{xlix} As films that destabilize conventional state-based assumptions about nuclear warfare and its consequences, these global radiation documentaries also answer the call for a new form of documentary issued in the late 1990s by film scholars John Hess and Patricia Zimmerman. In “Transnational Documentaries, A Manifesto,” Hess and Zimmerman claimed that new global flows of capital and corporate dominance required a new kind of filmmaking, one which interrogated, though did not abandon, the notion of the state. Such transnational documentaries, they argued, would “think through the shifting, multiple relationships between the South and East, North and West as fluid, intersecting categories that are never stable or fixed.”

^l Brown notes that a subsidiary of Haliburton, Kellogg, Brown and Root, has invested in the rail line that intends to take uranium out of Australia and return radioactive waste to the country’s core.

^{li} Bradbury’s role as the organizing intelligence of the film also brings to mind another anti-nuclear documentary, Peter Watkin’s epic 14.5 hour film The Journey (1985), which focuses on documenting the level of global awareness about the impact of the nuclear arms race.

^{lii} Given this, Bradbury’s aerial flight over the Olympic Dam can be read as a metaphor for cosmopolitan understanding. The security guard who denies Bradbury the right to stand on a public road and photograph the mine becomes a bit player in a larger drama once Bradbury is airborne. Significantly as well, Bradbury tells us that the only pilot who will take him over the mine is one who, like Bradbury, is “not local,” and thus free of the constraints placed on him by the Olympic Dam community.

^{liii} Heise, 210.

^{liv} Heise, 210.