

Feeling Unsafe: Exploring the Impact of Nuclear Evacuation

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Abstract

The 2011 disaster in Northeast Japan resulted in, among other things, the relocation of over 165,000 people from Fukushima and other parts of northeastern Japan. As of February 2017, there are still at least 80,889 people who have still not returned (Fukushima Prefecture 2017.2.6), and many others living in various states of dislocation. Some cannot return but many others are so-called 'voluntary evacuees' from outside of the compulsory evacuation zones who receive little or no compensation. Most of the women who have relocated in this way had no particular interest in, or knowledge about, nuclear politics, nor were they opposed to nuclear power, but many have become involved in anti-nuclear politics.

This essay draws on Petryna's use of bio-citizenship in post-Soviet Ukraine (2002) to think about bio-citizenship in post-Fukushima Japan, particularly with regard to expertise and ideas of what is, and is not safe. Taking a narrative approach, it explores stories of decontamination and resistance, looking at the ways the nuclear power plant accident has changed people, their lives and the ways they view themselves. I will suggest that while understandings that conflate being a woman with motherhood and peace have been used strategically by anti-nuclear movements, the struggle against nuclear power has brought a new subjectivity to many of the women involved that challenges the security discourse in Japan.

Key words: Fukushima, nuclear, decontamination, resistance, bio-power, safety, stories, Japan, radiation

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Introduction

*'If you shut your eyes to a little bit of contamination, then where do you draw the line? You wind up not being able to tell how much to allow. I don't know whether or not it's safe. They say it is, but who knows?'*¹

On 11 March 2011, the northeastern region of Japan was struck by an earthquake measuring 9.0 on the Japanese magnitude scale, the worst in recorded history in Japan. The earthquake was followed by a tsunami that destroyed towns, killed thousands of people, inundated an area of 561 km² (217 sq. mi) and left many communities without electricity, including the Fukushima Daiichi Nuclear Power Station (FDNPS). The plant had no alternative power source and a combination of damage and human error resulted in meltdowns in three of the plant's six nuclear reactors. The accident was rated as Level 7, equivalent in severity to only one other accident, the 1986 Chernobyl nuclear power plant disaster.

On that afternoon, I was on my way to a conference in Canada. I had left my home in Kobe in the morning, flown from Osaka to Tokyo where I got a limousine bus to Narita Airport. I had just arrived and was checking-in at a kiosk when the building started shaking. Everyone in the departure area ran for safety as the huge plate glass windows clattered and the building felt as if it would be torn apart. This was not my first earthquake; I was born and raised in Southern California and have experienced many in my forty years in Japan. But this earthquake was different, and brought back painful memories of the 1995 Great Hanshin-Awaji Earthquake that left scars on my body, heart and soul.

I spent the next few days camped in Narita Airport while trying to get a flight out. I was grateful for my own safety, and that of those around me. When power was restored, news began to trickle in about the tsunami – a horrifying spectacle that left me completely speechless and in tears – and then about explosions at the Fukushima Daiichi Nuclear Power Station. An international student of mine had been visiting Tokyo and called me, asking if I knew what was happening and whether he should leave Japan. I told him all I knew, which was next to nothing, and agreed that if he could leave he probably should (it was Spring break), and warned him to be especially careful to stay out of the rain because it might contain radioactive particles. In many places outside of Fukushima, it did.

My first trip to the area affected by the 3.11 disaster was just a couple of weeks later, at the end of March. I was part of a group sent from Kobe to explore possibilities for voluntary assistance in Miyagi Prefecture. The roads had been cleared but there was rubble everywhere. One of the places we visited was Yamamoto-cho, a town close to the prefectural border with Fukushima, where we distributed cups of fresh, hot coffee to people in an evacuation center and chatted with them. I had been talking with a woman who had lost everything in the tsunami and, as we watched rain pour down, I asked her if she was worried about radiation since we were so close to Fukushima and the path of the radiation plume. She looked around hopelessly, saying, 'There is so much to worry about and so much damage we can see, I can't bother with the invisible.'²

That trip marked the beginning of the Popoki Friendship Story, a drawing project that I thought would last a couple of months.³ In fact, it has become a long-term commitment to

¹ Interview with R.K. (2016.9), Osaka.

² Interview, 2011.4, Yamamoto-cho.

³ Alexander, R., 'Drawing Disaster: Reflecting on Six Years of the Popoki Friendship Story Project,' *Journal of*

communities destroyed by the tsunami and also to the people whose lives have been affected by the meltdowns at Fukushima Daiichi. Art has proved to be a powerful tool for communication, and has helped many people to open up and share their stories.⁴ Many of those stories have to do with feeling, or not feeling, safe.

As a peace activist, scholar and educator, I have often grappled with the question of what it is to be safe in personal as well as global terms. Ideas of national security are filled with contradictions about the meaning of safety. How, for example, can one feel safe if one's security is being ensured by weapons of mass destruction? But my work in northeastern Japan has underscored the importance of interrogating not only physical safety, but also the feeling of being safe,⁵ not as a dichotomy but as different aspects of what it means to be secure. An important part of the politics of life and living is the understanding of what is, and is not, safe.

Most people are taught to believe in the knowledge and judgement of experts, even as their life experiences may have taught them otherwise; having a doctor or a scientist tell us we are safe, often makes us feel safer. But sometimes, as in the case of a 14.5 meter sea wall being built along the coast of northeastern Japan, being told that something will make us safer does not necessarily feel safe – in this example because the wall blocks the view of the ocean and gives people a false sense of security. Other times, experts avoid discussing physical safety, suggesting that given the inability to guarantee safety, people should instead try to make themselves feel safe.

Nuclear technology, whether for weapons or power production, is generally considered to be intimately related not only to national security but also to the bodies with which it comes into contact. Looking at the aftermath of the Fukushima Daiichi accident through the lens of safety, particularly feeling safe, brings to light many aspects of the relationship between government, governmentality and our everyday lives. This essay will try to explore this relationship in the following four sections. The first gives a short overview of nuclear Japan. The second introduces the concept of bio-citizenship in the context of Chernobyl and Fukushima. The third focuses on decontamination and introduces some stories of people in Fukushima living with, and resisting, radiation. The final section focuses on more public acts of resistance and includes stories from people in Fukushima and also evacuees in the Kansai area.⁶

International Cooperation Studies, 25:2, 2018, Kobe University, 59-96.

⁴ There are many reasons why people open up and share their stories with me, and with other members of the Popoki Peace Project. Popoki's spaces are comforting, and unlike many volunteers and/or researchers, we do not ask people to share their stories. But drawing encourages people to communicate, and we have good listening skills. Also, talking about personal issues can be easier with outsiders, especially after a disaster when many new social divisions arise, even between friends, based on what a person has lost.

⁵ In Japanese, *anzen* (安全) and *anshin* (安心) come as a set – being and feeling safe. The English language works a bit differently, and safety/security varies among cultures, but there is a recurring assumption in many contexts that if one is physically safe then one should also feel safe. In this context, 'being safe' is on the one hand, our shared human vulnerability – see Butler, J., *Precarious Life: The Powers of Mourning and Violence*, (London: Verso, 2004) – but on the other, the understanding that each person experiences vulnerability differently.

⁶ There has been a lot of writing about Fukushima, both in Japanese and English (see for example Field, N. and Mizenko, M., trans., *Fukushima Radiation: Will You Still Say No Crime Was Committed?* 2015. Original published by Complainants for Criminal Prosecution of the Fukushima Nuclear Disaster.), although not much about the daily lives of evacuees, especially voluntary ones. As this is being written in English, I have tried to use primarily English language resources so that those reading it can reference them.

Nuclear Japan

Needless to say, Japan is not lacking in experience with the effects of radiation.⁷ In addition to Hiroshima and Nagasaki, Japanese have been affected by fallout from nuclear testing in the Pacific. In 1954, fallout from a United States hydrogen test at Bikini Atoll contaminated a wide area of ocean, including the Japanese tuna boat Lucky Dragon #5 and its crew, as well as many other fishing boats, crews and fish. The death of Aikichi Kubota, the radio operator on the Lucky Dragon, from radiation poisoning and the contamination of Pacific tuna made big news, although until recently the extent of the damage remained a well-kept secret.⁸ It also added steam to the nascent anti-nuclear movement in Japan, mobilizing women in particular. This marked the beginning of Japan's so-called 'nuclear allergy,' manifested at first as strong opposition to anything nuclear.

The anti-nuclear movement mobilized many Japanese women who were celebrating their new rights to political participation. In the fifties and sixties, many women and men raised their voices in opposition to nuclear weapons and/or testing, opposition to the US-Japan Security Alliance, and a variety of movements that rose up as a result of environmental/industrial crises such as Minamata disease. Gradually, however, technology came to be seen as a way to overcome the shame of defeat and recover power in the post-war world.⁹ For some, such as politician (later prime minister) Yasuhiro Nakasone and media mogul Matsutaro Shoriki, owner of the Yomiuri Newspaper and Japan's first private TV station NTV, that meant developing nuclear power.¹⁰

Nakasone's interest in nuclear power began in the United States which was at that time interested in promoting its nuclear power industry. For the U.S., starting a nuclear program in Japan was attractive for, among other things, symbolic reasons: 'nuclear victim' Japan supporting nuclear power would be tremendously useful for the future expansion of the American nuclear industry. U.S. President Dwight D. Eisenhower's Atoms for Peace program was only the tip of the iceberg; the CIA worked with Shoriki and others to present a variety of cartoons, manga, exhibitions and other activities promoting 'safe and peaceful' nuclear use.¹¹ Leaving the question of nuclear weapons aside, Japan's high incidence of seismic activity, typhoons and other extreme weather events alone should have made people concerned about the safety of building nuclear power plants. Into the early seventies, there was relatively widespread opposition to nuclear power,¹² but gradually this was overwhelmed by assurances

⁷ Information about the extent of the damage in Hiroshima and Nagasaki was suppressed by the Allied Forces. Fear and discrimination were rampant; many survivors had disfiguring and frightening scars and people feared the long-term effects of radiation exposure. Many thought radiation exposure to be contagious, so survivors were suspect. This was true after the Fukushima accident as well. I understand this to be largely a fear reaction to the invisibility and implications of radiation.

⁸ Nankai Television journalist and film director Hideaki Itoh talks about the roughly 10,000 additional fishing boats and their crews that were exposed to radioactive contamination in the Pacific. Their stories were kept secret until recently. See, for example Itoh, H., *Houshanou wo abita X nen go* (放射能を浴びた X 年後), 2014, Kodansha.

⁹ Alexander, R., 'Remembering Hiroshima,' *International Feminist Journal of Politics*, 14:2, 2012, 202-222.

¹⁰ Krooth, et al. discuss how the CIA, backed by General Electric and Westinghouse, used Shoriki to promote nuclear acceptance in Japan. Krooth, R., M. Edelson & H. Fukurai, *Nuclear Tsunami: The Japanese Government and America's Role in the Fukushima Disaster*, (Lanham: Lexington Books, 2015).

¹¹ Krooth, et. al., *Nuclear Tsunami*.

¹² In 1972, the pro-nuclear Japan Socialist Party came out against nuclear power. A radiation leak from a nuclear-powered ship in 1974 led to protests and increased calls for nuclear safety. The oil shock and new government incentives for communities willing to house nuclear power plants greatly reduced the impact of this anti-nuclear movement. See Bricker, M. (ed.), Independent Investigation Commission on the Fukushima Nuclear Accident, *The Fukushima Daiichi Nuclear Power Station Disaster*, (London: Routledge, 2014), 43-44.

of safety, economic growth and substantial monetary incentives for local municipalities willing to accept nuclear power stations.

But with the exception of a small minority of stoic and committed experts and activists who from the beginning questioned Japan's commitment to nuclear power and remained critical, the discourse of nuclear power as safe and necessary became firmly entrenched. The large monetary and other incentives offered to coastal towns for hosting nuclear plants also helped. By 2011, Japan had 55 nuclear power stations and plans for more. They had become so normalized as to be an almost invisible (and certainly everyday) part of the coastal scenery.¹³ As a result, the Fukushima accident came as a surprise to the majority of people in Japan, shaking their faith in the government to always give priority to their safety.

The FDNPS accident has proven to be a political, technological, economic and personal nightmare. Costs for 'controlling' the damage have soared into trillions of yen, placing a heavy burden on taxpayers at a time when the economy was already in decline. The Japanese government, nuclear industry, nuclear experts and other members of the 'Nuclear Village'¹⁴ are faced with the problem of how to protect their enormous investment. They have adopted a tri-part solution predicated on re-starting the currently off-line reactors and continuing to build new ones. The so-called solution entails: (1) Politics: emphasis on nuclear power as 'clean energy' in the context of climate change and carbon emission negotiations, (2) Technology: emphasis on their technological ability to 'control' the disaster and reclaim the contaminated areas, and (3) Economy: emphasis on the export of nuclear technology as part of a package to provide economic growth. The success of these strategies does of course lie to some extent on the development of technology capable of dealing with the problem. But to a much greater extent, it is necessary to convince everyone that there is not a problem; that everything is back to normal and perhaps even that there really was not such a big problem to begin with. It requires re-establishing widespread belief in the government and the myth of nuclear safety that has been the rule since the beginning of the nuclear industry in the late fifties.

Today, more than six years since the disaster, the Fukushima Daiichi Nuclear Power Station is still far from being under control. There are still 80,889 people listed as having evacuated¹⁵ and many others living in various states of dislocation. Many of these people are mothers and children who have left husbands/fathers/family in Fukushima and relocated elsewhere. Words like 'relocation' and 'voluntary evacuation' help to promote a discourse of recovery and safety, making invisible the struggles of people trying to get on with their lives.

¹³ Of course, there were problems, too. One of my respondents told me that there were often 'small accidents,' but people 'knew they shouldn't talk about them' (Interview with A.S., Namie and Fukushima City, 2014.5). Similarly, there are people who have been anti-nuclear power activists all along. Some, like nuclear physicist Professor Anzai Ikuro, suffered serious harassment as a result (personal communication).

¹⁴ The 'Nuclear Village' is a name for the 'political, governmental, industrial, academic and media entities' (Bricker, 2014:50cf) that together serve to maintain the Japanese nuclear industry and the myth of nuclear safety. One definition reads: 'Utilities companies, plant manufacturers, ministries such as those responsible for the economy, trade, science and technology, the mass media, mainstream researchers – this group of people who got rich from promoting nuclear power ended up with a huge amount of influence over the political and -financial worlds, and over the academic community as well as the media. This exclusive club ended up with the moniker of "Nuclear Village."' Fukushima Booklet Publication Committee, "10 Lessons from Fukushima: Reducing risks and protecting communities from nuclear disasters." Issued March 11, 2015.

¹⁵ Fukushima Prefecture, 'Heisei 23 nen tohoku chihou taiheiyouki jishin niyoru higaijoukyou sokuho (dai 1680 ho); Report on the damage from the Great East Japan Disaster,' No.1680, 2017.2.6 Available at: http://www.pref.fukushima.lg.jp/uploaded/life/257209_603392_misc.pdf

The national and prefectural governments are working hard to decontaminate the areas that were subject to compulsory evacuation and return residents to their former towns. They cannot force them to return, but they offer various incentives to do so, and disincentives to stay away.

The ‘official’ evacuation area and its surroundings are in the heartland of agricultural Japan; dairy, vegetable, and fruit farmers as well as those making their living off the sea find themselves living in urban apartments and shopping at supermarkets. ‘I’ve never had to shop for vegetables! We grew everything, or just went to the mountains and picked what we needed. Now we can’t even burn wood for our stove because it’s contaminated.’¹⁶ Such dislocation is physical, mental and emotional. Even the physical part does not happen only once. A.M. fled to Tokyo, and then moved to Osaka, back to Tokyo and then to several locations in Kyoto.¹⁷ R.K. eventually settled in Kyoto but has moved several times because subsidies have been reduced or ended.¹⁸ K.S. was evacuated to Fukushima City and has now settled in Ibaraki Prefecture. She said living in Fukushima as an evacuee had made her fat and tired, and she wanted to be near her grandchildren.¹⁹

Regardless of current address, the meltdowns dislocated everyone. However, for the purposes of this essay, evacuees can be divided roughly into four groups: (1) so-called official (compulsory) evacuees or people who received evacuation orders after the disaster and remain outside of the contaminated areas; (2) so-called voluntary evacuees²⁰ or those who left out of concern for their own safety and that of their families and remain relocated; (3) so-called voluntary evacuees who have returned; (4) so-called official evacuees who have returned to decontaminated towns at the behest of government and/or local authorities. Of course, there are many people who never left. Many of them live in areas with enough background radiation to require/qualify for decontamination, but not evacuation.²¹ Some of them express concern and others do not.

Today, the Japanese government, intent on re-starting the nuclear plants off-line since the disaster and exporting Japanese nuclear technology abroad, issues assurances of safety and insists that nuclear power is both ‘clean’ and essential for the maintenance of the flagging Japanese economy. Even in Fukushima Prefecture, things are returning to ‘normal’. How can one fight back against this powerful discourse of the necessity for, and safety of, nuclear power? Litigation, media and loud voices are of course important. But resistance is also in the small acts of everyday life – opening a window, smelling a flower, buying a peach. These small acts that before the disaster were taken for granted now require consideration, leading to the creation of a new political subjectivity based on the need to protect oneself and one’s loved ones.

In thinking about resistance and subjectivity, this essay focuses primarily on people who belong to the second and third groups. It will use information gathered from ongoing interviews and conversations with evacuees, both in Fukushima Prefecture and in Kansai, beginning in June of 2013 and ongoing to the present. These conversations have focused on my interest in being and feeling safe,²² looking to identify the ways individuals understand the discourse of ‘normalcy’ and how they do, or do not, feel safe. Here I will also borrow

¹⁶ Interview with K.S. 2014.12, Fukushima City.

¹⁷ Interview with A.M. 2015.6, Osaka.

¹⁸ Interview with R.K. 2016.9, Osaka.

¹⁹ K.S. 2014.12.

²⁰ Many so-called ‘voluntary’ evacuees object to the division between official (compulsory) and voluntary evacuation because they feel they had no choice but to leave, even though there was no order from the government to do so.

²¹ Fukushima City, the prefectural capital, is one such location. Activists claim that the government was unwilling to evacuate the roughly 300,000 residents or to effectively shut down the prefecture’s economic center.

²² ‘Safety’ is a subjective and fluid concept that has two distinct but frequently conflated aspects: being safe and feeling safe. In the absence of ways to guarantee external safety in the face of radiation, the manipulation of feelings of safety is one strategy being used to make the nuclear crisis invisible. It was also used successfully before the Fukushima accident as exemplified by the widespread belief in the so-called ‘myth of nuclear safety.’

from Petryna's use of bio-citizenship in post-Soviet Ukraine²³ to think about the importance of 'expert' knowledge and information.

Learning from Chernobyl: Biopolitics, Bio-citizenship and Safety

According to Michel Foucault, at an important moment in eighteenth century France, the consolidation of the administrative power of the state and a concern for health and welfare of populations occurred. Demographic studies of such things as life expectancy, marriage, and procreation made populations more predictable and helped to assess their importance for the state. Foucault outlined two aspects of the concept of bio-power, one at the level of the human body as the object of discipline and surveillance and the other at the level of regulation of populations.²⁴ Foucault explains that unlike the situation under sovereign power, this new governance does not deal with things but with interests, intervening only when the interests of particular populations are at stake.²⁵ Personal hygiene and the maintenance of good health are important for maintaining the health of the nation and preventing the spread of disease. In the eighteenth century, the focus was on eliminating contaminated spaces in order to control illness and disease. This changed in the nineteenth century and beyond to surveillance of interpersonal relationships to prevent the spread of disease.²⁶ The case of radioactive contamination is interesting in this context because while it is in theory space/place based, the contamination cannot be entirely contained and the effects cannot be entirely known or predicted. It is the combination of contaminated places/spaces, spread of contamination and unknowability of the implications that make it such a difficult problem.

Adriana Petryna applies Foucault's thinking to populations exposed to the Chernobyl nuclear power station accident. This accident and its aftermath occurred at a particular moment in history, the final years of the Cold War, in a particular place, the Ukraine. Petryna suggests that the accident had important implications for Ukrainian state-building and citizenship. The linking of biology (radiation effects) and identity (as a radiation survivor) in post-Soviet Ukraine created 'new' biological identities that potentially drive political economies, foster identity-based illness movements, generate new affective disorders and 'become central to contemporary forms of citizenship'.²⁷ In the Ukraine, access to goods and services as well as opportunities for life and living are dependent upon a person's official 'dose'.²⁸

Human beings are not capable of detecting the presence or absence of radiation; it is invisible, has no scent or taste and cannot be felt. The damage caused by radiation is dependent on the amount and manner of exposure but most of those exposed have no way to measure what in fact their 'dose' was. In the case of Chernobyl, there were few official maps

²³ Petryna, A., *Life Exposed: Biological Citizens after Chernobyl*, (Princeton, NJ: Princeton University Press, 2002).

²⁴ Foucault, M., *The History of Sexuality*, (Éditions Gallimard, 1984), 143; see also *Power/Knowledge: Selected Interviews and Other Writings, 1972-77* (Harvester Press, 1980).

²⁵ Foucault, M., *The Birth of Biopolitics. Lectures at the College de France 1978-1979*, (New York: Palgrave Macmillan, 2008), 44-45.

²⁶ Nadesan, M., *Governmentality, Biopower, and Everyday Life*, (New York: Routledge, 2008): 94-105.

²⁷ Petryna, *Life Exposed*, 14.

²⁸ Petryna (2004) says that 3.5 million people equaling seven percent of the population of the Ukraine are 'poterpeli' (sufferers) and claim entitlement to medical care, education, subsidies and other social protections. A range of categories based on the amount of exposure to radiation (dose) have been established to determine how much individuals will receive. 'Non-sufferers' have less access to these protections than 'sufferers', but medical and scientific knowledge are essential for 'sufferers' to maintain their status (255). Petryna, A., 'Biological Citizenship: The Science and Politics of Chernobyl-exposed Populations,' 2004. Available from University of Pennsylvania Scholarly Commons: http://repository.upenn.edu/anthro_papers/21.

of the spread of contamination but later, in the ‘Ukrainian period, an array of maps appear – unofficial maps, state maps, revisions of state maps....In short, daily life is characterized by overwhelming uncertainty and unknowability.’²⁹

Uncertainty changed the relationship between elite experts with access to scientific facts and the ignorant majority and so affected bio-citizenship. ‘That this science can be the sum of knowledge, ignorance, and imprecision becomes part of the plasticity of the biosocial experience. ... the indeterminacy of scientific knowledge about the illnesses people face and about the nature of atomic catastrophe emerges here as both a curse and a point of leverage.’³⁰ Moreover, a ‘catastrophe whose scale was unimaginable, difficult to map, and “saturating” became manageable through a particular dynamic: non-knowledge became crucial to the deployment of authoritative knowledge, especially as it applied to the management of exposed populations.’³¹ Petryna discusses how some people tried to inflate their doses or ‘didn’t want to recover’ in order to maintain their level of assistance.³² The issue, she says, is ‘the state’s capacity to produce and use scientific knowledge and non-knowledge to maintain political order.’³³

The situation in Japan is of course very different from that in post-Soviet Ukraine. Yet there are enough similarities to suggest that the some of Petryna’s thinking about biological identities and the idea of bio-citizenship might be useful in the Japanese case to better understand the relationship between contaminated land, bodies and the state. For example, similar to Chernobyl, the extent of the spread of radiation from the Fukushima nuclear disaster was not immediately made public and remains in many ways unknowable.³⁴ Like Chernobyl, some people went about their everyday lives in ignorance that they might be in danger. Others understood the danger but did not have access to information, accurate or otherwise. And many others simply believed government reassurances that there would be ‘no immediate damage.’³⁵ Stories of nosebleeds, nausea, diarrhea, headaches and rashes flashed across social media but experts were unable or unwilling to name radiation from the accident as the cause. Instead, in spite of years of accidents and exposure associated with all aspects of the nuclear cycle, medical and scientific experts claimed lack of sufficient information on the effects of low-level exposure over long periods of time. This fact alone is evidence not only of the importance of the ‘unknown’ in maintaining expertise on one side and ignorance on the other, but also the role of ‘expertise’ in ensuring that important but

²⁹ Petryna, *Life Exposed*.

³⁰ Ibid.

³¹ Ibid., 39.

³² Petryna, ‘Biological Citizenship,’ 256.

³³ Ibid., 258.

³⁴ This is still happening with, for example, the occurrence of thyroid cancers in children. See *Japan Times*, ‘Even more Fukushima residents diagnosed with thyroid cancer,’ 2017.6.7, Kyodo news service. Available at: <http://www.japantimes.co.jp/news/2017/06/06/national/seven-fukushima-residents-diagnosed-thyroid-cancer/> Another example was of a tulip with petals growing out of its stem that I found in May of 2014 near a temporary housing community for evacuees near Fukushima City. I took photos and asked a biologist colleague about it. He shook his head and said to make note of the location and date.

³⁵ ‘No immediate damage’ was the official line of the government, based on a press conference report from Chief Cabinet Minister Edano. For example, the following on-line commentary appeared on a site run by the Asahi Newspaper. ‘After the March 2011 Fukushima Daiichi Nuclear Power Plant accident when levels of radiative iodine surpassing safety standards were being detected in milk and spinach from within the 20-30 km. area around the plant, the then Chief Cabinet Minister EDANO Yukio repeated frequently at a press conference that “They are not levels that will immediately affect human bodies or health.” This type of vague statement which does not address the effects of long-term exposure or acute exposure was the target of criticism from the beginning. As scholarly investigations continued, it became clear that the citizens took the problem more seriously than the government. How should the government report about the effects of radiation after a nuclear power plant accident?’ 21 March 2011, <http://webronza.asahi.com/national/themes/2913030700002.html>

uncomfortable questions do not get asked and that the significance of those questions remains unknown, or at least unspoken.

Evacuees, residents of Fukushima Prefecture and others continue to ask, 'How can we know what is really happening? How can we know what is safe?' The unknowability of what might be safe is demoralizing, but can also be radicalizing: people realized that they had to act to protect themselves. For example, while it is common knowledge that fallout from a nuclear explosion is affected by atmospheric conditions at the time of the explosion, the government drew concentric circles around the stricken power plant indicating exposure zones and necessary levels of evacuation and/or evacuation preparedness. Residents watched the circles grow and wondered if and when their homes might be included.³⁶ One mother in Nihonmatsu, a city about 50km from the FDNPS, told me about watching the evacuation line expand and waiting anxiously in the hope that it would reach her home and she would have to evacuate.³⁷ Another said that her husband, a New Zealander, was told by his company to evacuate so they left before the Japanese evacuation order was given. As a result, she said that since she was not in the area when the Japanese order came she does not qualify for compensation.³⁸

Knowledge, uncertainty and ignorance are continuing to play an important role in the management of the crisis. For the government, it remains essential that nuclear power not become securitized and that people accept the government's assurances of safety. This applies on the one hand to implementation, acceptance and understanding of decontamination and on the other to the ways people understand their choices, including the opportunities for, and meaning of resistance.

The March 11 disaster provided an opportunity to re-think what it means to be safe in a disaster-prone country with high dependence on energy and sophisticated technology. The post-3.11 bio-citizen maintains sufficient food, water and other necessities on hand to survive a disaster for three days without outside assistance. Assessment of disaster vulnerabilities reinforce and/or add new dimensions to social categories based on age, disability and race. Recognition that social isolation can leave one vulnerable in an emergency justifies incursions on privacy, reinforcing the surveillance aspect of bio-politics. New maps and data are created based on assumed/assigned vulnerabilities, such as those made to designate access to, and results of thyroid and other examinations for affected children. The gaudy signs proclaiming 'Fukushima will rise again! Fukushima is the land of happiness! Fukushima will recover! Fukushima, fight!' that decorated the landscape of Fukushima City are gradually disappearing. Life returns to normal, and good bio-citizens understand their safety as guaranteed by large black plastic bags filled with waste taken during contamination. Those who remain but question that safety are isolated and increasingly silent/silenced; the rest have left.

³⁶ Immediately after the accident, the actual SPEEDI (System for Prediction of Environment Emergency Dose Information) map showing the path of the radioactive plume was shared with the U.S. military, but not made public until later.

³⁷ Interview with R.S. 2014.5, Nihonmatsu.

³⁸ A.S. 2014.5, Namie and Fukushima City.

Decontamination

Decontaminate: 'to remove dirty or dangerous substances (such as radioactive material) from (a person, thing, place, etc).'

Contaminate: 'to make (something) dangerous, dirty, or impure by adding something harmful or undesirable to it.' (Merriam-Webster's Learner's Dictionary)

Exposure to radiation can be external and/or internal. Reducing risk from external radiation involves scraping and washing to remove and/or reduce the source of contamination. Internal exposure can be reduced through minimizing ingestion of contaminated food and by minimizing contamination of the air, water and food.³⁹ After the March 11 disaster, an issue of great urgency was how to reduce the risk of both internal and external exposure and make the evacuated areas inhabitable and productive. A related problem was how to overcome widespread fear of internal exposure and skepticism about the safety of food products from Fukushima, even those from outside of the areas officially designated as having been affected by radioactive contamination. The best solution was deemed to be decontamination, the 'scraping and washing' of contaminated areas to reduce the amount of external exposure.⁴⁰ The Act on Special Measures Concerning the Handling of Environmental Pollution by Radioactive Materials Discharged by the Nuclear Power Station Accident Associated with the Tohoku District-Off the Pacific Ocean Earthquake That Occurred on March 11, 2011 (effective January 2012) calls for decontamination of the soil and other things that were contaminated as a result of the accident, setting the target at an exposure rate of 1 mSv/year.⁴¹ The Act sets out the terms for conducting the necessary investigations and measurements, as well as the sequence in which decontamination is to be implemented.⁴² Local governments in Fukushima and surrounding prefectures drew up plans based on the Act and are responsible for the costs of decontamination in their jurisdictions.

The process of decontamination involves scraping the surface of whatever is being decontaminated. In the case of soil, once the contaminated soil is removed and placed in large plastic bags, it is replaced with uncontaminated dirt. Streets, parking lots and other paved spaces are washed using high pressure sprayers and spinners. Rooftops, streets, walls, trees, signs, lamp posts, and other objects that can be scraped are scraped; everything must be decontaminated. Rain gutters have especially high levels of contamination as they collect

³⁹ Anzai, I., 'Scientific and Social Aspects of the Fukushima Nuclear Disaster'. English version translated by Stephen Suloway, 2012, p. 12-13

⁴⁰ The word 'decontamination' implies that contamination can be removed, but in fact means contamination reduction. Reducing the amount of contamination is preferable to leaving it as it is, but some critics say that 'decontamination' disguises the fact that all of the contamination from the explosions cannot be removed. Therefore, while contaminated areas may be made safer by decontamination, they cannot be returned to their prior state and are not necessarily safe.

⁴¹ Anzai explains: 'The unit for measuring personal exposure to radiation is the Sievert (Sv). Yet a radiation dose of just 1 Sievert is so large that it is life-threatening, so in practice the units that are usually used are the millisievert (a thousandth of a sievert) or microsievert (a thousandth of a thousandth (p. 12) ... People exposed to 1 Sievert will likely show symptoms of acute radiation injury such as nausea and diarrhea, while half the people exposed to 4 Sieverts and all of the people exposed to 7 Sieverts are likely to die within a month after a single exposure' (p 6).

⁴² Government of Japan, Ministry of the Environment, 'Decontamination Guidelines,' 2013. The English version is available at: http://josen.env.go.jp/en/framework/pdf/decontamination_guidelines_2nd.pdf

radioactive rainwater and dust. The collected materials are put into black flexible container bags.⁴³ Details of decontamination programs are decided by local authorities, but generally schools, living and working spaces were decontaminated first, followed by public spaces including agricultural spaces. In Fukushima City, forest areas proximate to inhabited spaces are currently being decontaminated by removing underbrush, soil and cleansing the lower trunks of trees. This phase was to be finished by the end of March 2017.⁴⁴ Needless to say, decontamination work is hard, hot and risky but it also creates a lot of jobs. The foreman of one decontamination crew told me he was happy for the work and not worried about the risk, but confided in a small voice that some of his crew with young children worried about going home after work and spreading contamination to their children.⁴⁵

According to officials at the Decontamination Information Plaza in Fukushima City, it took about a year for decontamination policies to be established and funding allocated. People who wanted to decontaminate their living spaces before these measures were in place, or before their assigned turn could hire contractors at their own expense. There is still no permanent storage site for the soil and other debris generated by decontamination. At first it was put into huge plastic bags and stored on site. Now it is being collected and stored in temporary storage areas, generally leased from local citizens. Work on a permanent storage facility in the vicinity of the Fukushima plant site was supposed to begin in March 2017, but it not yet completed. Efforts to control the flow of radioactive water from the damaged plant are not proceeding smoothly and decommissioning is still a long ways away.⁴⁶

Decontamination definitely lowers radiation levels, but it is virtually impossible to decontaminate everything. Moreover, wind and rain bring more contamination, raising levels in places that have already been decontaminated. Leaving aside the problem of what, if any, level of radioactive contamination is actually safe, even if initially successful decontamination cannot be a permanent solution unless all the radiation is removed which, of course, is impossible. Another reason that decontamination is not a viable solution is the problem of what to do with the waste.

Here, again, the issue of expert knowledge is important. The Decontamination Information Plaza avers there is no problem. They cite the UNSCEAR 2013 Report on Fukushima that found, '(1) Any discernable changes in cancer cases may not be identified related to the accident in the future; (2) Thyroid cancer cases for children with the highest

⁴³ The bags are made of polypropylene woven cloth. Each bag holds 1,000L and weighs 1,500 kg when full (Taiyo Seal Pack website). According to an official at FDC, the bags collected as of September 2016 would fill the National Stadium in Tokyo 25 times over (FDC 2016.9).

⁴⁴ In September 2016, I asked a foreman of a decontamination crew whether he thought they would be finished on time. His answer was negative and he seemed to think there was a lot of work to be done (personal communication, 2016.9.22). For information on decontamination from the government see Ministry of Environment, Environmental Remediation site available at: <http://josen.env.go.jp/en/decontamination/>

⁴⁵ Interview with N.M. 2016.9.22, Fukushima.

⁴⁶ For example, the following appeared in the Asahi Newspaper on 2 September 2016: 'Rainfall from recent typhoons caused partial melting of the "ice wall" at the Fukushima No. 1 nuclear plant, allowing highly radioactive water to leak from around the damaged reactor buildings... [TEPCO] said melting occurred at two sections of the ice wall... TEPCO officials believe that during the latest typhoon, contaminated water from around the reactor buildings flowed through openings of the ice wall created by the deluge and reached downstream toward the sea... "If there had been an additional 15 cm of rain, (the contaminated water) could have poured out over the ground surface" and spilled into the sea, a TEPCO official said... The Meteorological Agency's initial forecast said Typhoon No. 10 would bring a maximum 20 cm of rain a day at some locations in the Tohoku region... TEPCO admitted the underground wall of frozen dirt is not working.' (For a number of references, see the following: <http://ennews.com/alert-typhoons-failure-ice-wall-around-fukushima-reactors-highly-radioactive-water-flowing-ocean-structure-critically-affected-fears-multiple-sections-barrier-thawed-expert-plan-block-grou/comment-page-3>.)

expose dose could not be scientifically denied so that precise monitoring is to be continued; (3) congenital anomalies or genetic effects are not identified.’⁴⁷ ‘Of course they don’t talk about what might happen in the future. Besides, after all of the lies, cover-ups and misinformation, who would believe them anyway?’⁴⁸

Stories of Decontamination

Most people would agree that decontamination is better than leaving things as they are. But the invisible borders between ‘clean’ and ‘tainted’ not only recreate social and physical borders in affected communities, but they affect understandings and performance of culture. Radioactive contamination cannot be magically made to disappear, nor can decontaminated spaces be the same as they were before. Decontamination changes the entire map of a community.

R.S. lives with her husband and two children in a city located about 89 km from the Fukushima Daiichi plant, a distance and area that is supposed to be safe and is well beyond the 20km compulsory evacuation zone. Worried about the safety of their children and other children who attend a nearby nursery school, the family had the radiation levels checked. They were horrified to find very high levels, especially on the roof. With the help of volunteers, they scraped the roof and managed to reduce the amount of radiation by the end of 2011. When I met R.S. in 2014, she said that levels of contamination are still high in the surrounding area. In order to keep the children at the nursery school safe, they are required to take off their shoes when they arrive and leave them off until they go home, even when playing outside. When they go out to play, it is in a special, decontaminated area and the children play barefoot. R.S. showed me a tree outside their house that had been decontaminated. One tulip was blooming under the tree in soil that was otherwise devoid of plants. R.S. told me that there must have been a tulip bulb in the clean soil that was imported to replace the tainted soil they had removed. I wondered what other secrets that ‘clean’ soil might contain.

R.S. shared a story about her daughter who was in grade three and son who was in grade one of primary school. ‘It was easier when the children were little and I was with them all the time. Now I have to let them go out on their own. They know that they are not supposed to touch flowers or trees, but how can I know what they are doing when I am not there? Food is a problem, too. But what broke my heart was when my daughter came home from school this past spring and asked me if I had ever been cherry blossom viewing. How can you be Japanese and have never gone cherry blossom viewing?’⁴⁹ The Fukushima

⁴⁷ UNSCEAR, ‘Sources, effects and risks of ionizing radiation: UNSCEAR 2013 Report Volume I, Report to the general assembly scientific Annex a: Levels and effects of radiation exposure due to the nuclear accident after the 2011 great east-Japan earthquake and tsunami,’ United Nations Publication Sales No. E.14.IX.1, p. 10., 2013, ISBN: 978-92-1-142291-7 e-ISBN: 978-92-1-056501-1

http://www.unscear.org/docs/publications/2013/UNSCEAR_2013_Report_Vol.I.pdf

For criticism of the risk involved in decontamination, see for example, Baverstock, Keith, ‘2013 UNSCEAR Report on Fukushima: a critical appraisal,’ *Kagaku* (科学) 2014, Vol.84, No.10, 2014: 1-8. See also, Physicians for Social Responsibility, et. al., ‘Annotated Critique of United Nations Scientific Committee on the Effects of Atomic Radiation,’ (UNSCEAR) Fukushima Report to the UN General Assembly, October 2013. Available at: <http://www.psr.org/assets/pdfs/critique-of-unscear-fukushima.pdf>

⁴⁸ Interview with N.M., 2016.9.21, Fukushima City

⁴⁹ Cherry blossom viewing is a ubiquitous spring event in Japan. People generally sit under the cherry trees, eating, drinking and admiring the beautiful blossoms. N.M. and M.O. also shared that they do not take their children to view cherry blossoms. M.O. explained that although people invite her to go, saying it is a special occasion, she feels that since they are always exposed to external radiation, it would just be voluntarily adding to their own exposure (Interview with M.O., 2016/9/21, Fukushima City).

Daiichi accident has robbed people not only of their homes and livelihoods, but also of the small, meaningful pieces that make up not only everyday life, but also community and culture.

Decontamination changes, but does not erase borders. N.M. was born and raised in Fukushima City. After the disaster, she took her younger son and sought refuge; her older son refused to leave and stayed behind with her husband who was working in Fukushima. She stayed close enough that they could meet on weekends, but living a double life was exhausting. After a year, N.M. moved back to Fukushima and her family was reunited. She has been there ever since, although she takes advantage of opportunities for ‘refresh holidays’⁵⁰ away from the radiation. Like many others from Fukushima, N.M. comments that if the accident had not happened, she might never have been able to travel to so many other parts of Japan.⁵¹

N.M. told me that she first heard about decontamination in May of 2011 at a citizens’ meeting in Fukushima City. At first, she did not understand what the term meant, and wondered what it was. The first time she actually saw decontamination in practice was at the elementary school her children attended, where they were decontaminating the school ground. ‘I remember watching them use a shovel car to take up the surface, and then to dig deeper. I thought they were trying to replace the contaminated top soil with uncontaminated sub soil and wondered if it made any sense. After all, the contaminated soil would still be there. I said that instead of calling it “de-contamination (除染)” they should call it “trans-contamination (移染).”’⁵² For N.M., the color of decontamination is that of the flexible container bags used for storing decontamination waste – black.

M.O. also lives in Fukushima and was pregnant with her second child when the disaster happened. She left for two years. When she first heard about decontamination, she said she was happy to hear that it would reduce the amount of radiation in the air. But then she learned that they would use high pressure cleaners and the water would wash into the city sewer system. ‘That would just contaminate the sewers! And if they don’t start with the mountains, the rain will wash the contamination off the trees, it will be carried by the wind, and even if they decontaminate, the level of contamination will rise again.’⁵³ M.O. said she thought that rather than spending the money to decontaminate, the government should use it to make it possible for people to evacuate Fukushima.

In fact, M.O. says she was correct and after several months, the levels of contamination in places that had been decontaminated began to rise. She told me that she has gotten used to seeing bags of decontamination waste, but she wishes they would take them away to a storage site. They remind her that if the level goes below 8000 Bq⁵⁴, they will

⁵⁰ ‘Refresh holiday’ is a term used for trips hot springs and other relaxing and healthy places in order to recover and/or promote health. Since the Fukushima accident, it has been used to describe trips usually of 1-2 weeks offered to Fukushima residents, particularly children, to get them away from radiation and allow them to play outdoors and live free from the worry of contamination. Many non-profit organizations offer such trips, but the number is dwindling. Residents say that it is also gotten more difficult to take the time off to go, or to discuss wanting to go with friends and colleagues (Fukushima interviews, 2016.9).

⁵¹ N.M., 2016.9.21

⁵² N.M., 2016.9.24

⁵³ M.O., 2016.9.24

⁵⁴ ‘Becquerel is the derived unit of radioactivity in the International System of Units (SI), symbolized Bq and equal to one disintegration or nuclear transformation per second. ...The becquerel is a small unit. In practical situations, radioactivity is often quantified in kilobecquerels (kBq) or megabecquerels (MBq),’ at <http://whatis.techtarget.com/definition/becquerel>. The reference to 8000 Bq refers to the fact that incinerator ash with 8000 Bq/kg or less is treated as ordinary waste, 8000-100,000 Bq/kg is buried away from groundwater and public bodies of water, and that with more than Bq 100,00/kg is stored in shielded facilities. See Bricker, M., ed., *The Fukushima Daiichi Nuclear Power Station Disaster*, Independent Investigation Commission on the

re-use the soil, a frightening idea for her. She added that it is important to be informed and know what has and has not been measured. When told that the level has fallen, does that mean cesium? Plutonium? Strontium? For M.O., the color of decontamination is not a bright hopeful one, but a dull black or gray.⁵⁵

R.K. left Fukushima City with her daughter after the disaster and has relocated to Kansai. She doubts she will ever be able to return. She also thinks the color of decontamination is black, and that things would probably have turned out differently if radiation were colored instead of invisible. At the same time, she said that people have different feelings about how much is safe or not safe. It depends on the individual. She shared her anger. ‘We’re taught that things that are dirty and contaminated are removed from the vicinity of where people are living. But we’re being told to live in the midst of contamination. That’s not right! If you shut your eyes to a little bit of contamination, then where do you draw the line? There is no end to it. Food is supposed to be safe, too, but is it? They used to not sell food that was unsafe, but now.... The best we can do is make what we hope are safer choices within the options we have.’⁵⁶

If one lives in Fukushima or anywhere else in Japan, avoiding internal and external exposure is an issue. The official position is that once decontamination has been finished and background radiation levels have dropped, it is safe to play outdoors, eat local food and go on with one’s usual life. The pressure to accept this view and go on as if nothing has happened is intense. N.M. shared how it is harder and harder to access counter-narratives of the danger of contamination while living in Fukushima.⁵⁷ Life can be full of hard decisions, one of the most difficult of which is deciding what to eat.

After the disaster, R.S. organized a nation-wide network to supply safe food to mothers with children in her city. N.M. and M.Y. searched the supermarkets for food from outside Fukushima Prefecture. They refused to allow their children to eat lunches provided at school or to drink locally produced milk. R.K. has relocated to Kansai, but still checks the labels on food products carefully to be sure they are not from affected areas. One mother who has relocated shared that at first she tried not to buy Fukushima agricultural products, but reconsidered. ‘After all, they test food from Fukushima. It might actually be safer than food from parts of northern Kanto that isn’t tested.’⁵⁸ N.M. and M.O. told me that they had heard that theory, but that it is also a problem of what is tested. ‘After all, they can’t, or don’t, test everything all the time. And they can’t be trusted, either. So you can never know.’⁵⁹ The answer for many was to do their own testing. Individuals bought Geiger counters, children were monitored to find their cumulative dose, groups got together to learn how to test food and raise money to purchase equipment. Many mothers refused to let their children eat lunches provided at school, preferring to give them homemade lunches that had been checked more thoroughly. This added yet another task to already over-burdened mothers and supporters, but was at the same time an empowering act of resistance as it provided an alternative to dependence on ‘experts’ and made at least some of the unknowable known.

In Japan, each local region is known for particular food products. Fukushima is known for its fruit, peaches and cherries in particular, and its coastal fishing. Selling produce from Fukushima in other parts of Japan is a popular way of supporting local farmers. I recall that in the summer of 2012 for example, the Kobe YWCA sold peaches from Fukushima. N.M. commented that although she feels badly for the farmers, this method of support is not

Fukushima Nuclear Accident, (London: Routledge, 2014), 137.

⁵⁵ M.O., 2016.9.21

⁵⁶ R.K., 2016.9.24

⁵⁷ N.M., 2016.9.21

⁵⁸ A.S., 2014.5, Namie and Fukushima City

⁵⁹ N.M., 2016.9.21

good because helps to spread the message of normalcy, recovery and safety. Others, both in and outside of Fukushima agreed with that view. For those promoting such activities, it is a way of combatting the negative image of Fukushima produce created by the accident. 'Of course, most YWCA members are quite elderly, so in their case maybe it doesn't matter so much.'⁶⁰ Bio-citizenship in post-Fukushima encourages the elderly to support the nation and economy by risking internal exposure in order to support Fukushima farmers.

Skepticism as to the safety of food and/or the reliability of government testing is not limited to the disaster area. S.N., a person displaced by the tsunami in Miyagi Prefecture, told me that Fukushima produce is available cheaply in local markets, but she tries to avoid buying it.⁶¹ Kobe, where I live, is more than 700km from Fukushima, but many of my friends and I try to avoid Fukushima produce and food that is especially sensitive to radiation, such as mushrooms. The Fukushima accident has changed the map of what we eat, and where we seek delicious and nutritious foods.

Living with radiation also involves making decisions about where to go and what to do. In September 2016, N.M. showed me a photo of an empty swimming pool at a junior high school. The bottom of the pool was littered with dirt and dead leaves, and there was a young student with a large broom. She told me that pool had been decontaminated in 2012 but had not been used. In 2015, they decided it was safe to swim and the students were organized to clean the pool before it was filled with water. N.M. was outraged and refused to let her son participate. Why? Because in the time between the decontamination and the proposed cleaning, dirt and leaves had been washed and/or blown into the pool from the surrounding areas. 'It would be like decontaminating the pool again, only this time it would be done by children instead of by adult workers. I don't want my son to have to be a part of that.' She also showed me a copy of a note that was sent home to parents, assuring them that in order to avoid unnecessary exposure, warm-up exercises before swimming would be held indoors. 'Maybe they should just stay submerged all the time!'⁶² Her anxiety made sense to me. When I asked S.A., a high school teacher who has expressed his concern about radiation publicly, about the pool problem, he explained the school's logic. 'If it is safe and normal, then students should engage in normal activities. Cleaning the pool is normal, so the school told them to do it. Of course it seems like a contradiction because you want the school to protect the students, but if it is normal then they need to engage in their normal activities. Otherwise the school would be shirking its educational duties.'⁶³

Of all the aspects of unknowability, the possibility of future illness is one of the most difficult aspects of the Fukushima disaster. Officially, there is no risk,⁶⁴ but all children within the affected areas are entitled to free medical testing. M.O. told me that both her children are tested twice a year, even though the younger was not born until several months after the disaster. N.M. shared that she did not trust that they were given the full results from the group testing. She desperately wants to her family to move to a safer place, but says her husband will have no part of it. Both women told me that they, and most of their friends, had been in counseling and suffered from stress. N.M. showed me where her hair has fallen out

⁶⁰ Ibid.

⁶¹ Interview with S.N. 2016.9.21, Sendai.

⁶² N.M., 2016.9.21

⁶³ S.A., 2016.9.22

⁶⁴ When I asked an official at the Fukushima Decontamination Information Plaza about why, if there is no problem, the number of children with thyroid problems is growing, the response was that, 'There are no more cancers here than in other parts of Japan. It is just that the numbers of children tested is much higher here, so naturally there are more cases of thyroid disorders....I teach the children that there is no risk, so the girls can say with confidence that they will be able to have normal children and respond to discrimination if they are subjected to it' (Interview at DIP, 2016.9.21).

from stress.⁶⁵

Living in Fukushima and worrying about radiation is lonely and stressful, but so is living as an evacuee, especially a ‘voluntary’ one. Many of these so-called ‘voluntary’ evacuees are women and children whose husbands (or often ex-husbands) are still in Fukushima. Although they get little compensation, many maintain two households and travel back and forth, an expensive and tiring lifestyle. Many are unwilling to tell people they are from Fukushima, and for those that do, there is often little or no support or understanding. They worry about their own health and that of their children, and lack access to disaster-related information. Some give in to the pressure and return, but have difficulty picking up where they left off with friends and relatives. Radiation changed not only the map of their everyday lives and spaces, but also that of their social relations.

One of the most compelling stories was told to me one evening at a camp for evacuees. ‘I only want the best for my son. I want him to have a good and healthy life. For that, he needs education as well as a good environment. But which is more important? If we stay here, I will not be able to afford to send him to college and give him the education he deserves. If we go back, he might wind up with cancer. What should I do?’⁶⁶

As the myth of the necessity and safety of nuclear power grows, so the situation of nuclear evacuees becomes less and less visible. Resistance to the nuclear village is widespread, but it takes the form of small acts of everyday life – taking away the expertise of the experts through study and information sharing, and acting on one’s own decisions about how to be safer in an unsafe world.

Public Resistance

‘It is so hard. No one pays attention, or they think we are mentally unstable or something. But what can we do? We have to keep on trying.’⁶⁷

Resistance to the situation caused by the nuclear disaster must be understood within the historical context of the silencing the anti-nuclear power discourse in Japan and the pressure to re-instate the myth of safety and normalcy.⁶⁸ Since the early days of the anti-nuclear movement, the involvement of women has been legitimized by assumptions that take as natural the association of women with motherhood, and motherhood with peace. One aspect of that argument is that as women are mothers and all mothers are peaceful because they have to protect their children, it is logical and natural for them to take a stand against nuclear weapons and for peace.

The question of gender essentialism has been challenged by many feminist scholars,

⁶⁵ An editorial four years after the disaster reported that the ‘Latest report from Fukushima revealed that more people have died from stress-related illnesses and other maladies after the disaster than from injuries directly linked to the disaster.’ See Japan Times, ‘Fukushima stress deaths top 3/11 toll - Uncertainties amid nuclear crisis acutely felt by elderly,’ *Japan Times*, Kyodo News Service, 2014.2.20. See also ‘Fukushima’s appalling death toll,’ (editorial), *Japan Times*, 2014.3.1; and ‘Yokohama mayor apologizes to schoolboy bullied for being nuclear evacuee,’ *Japan Times*, 2017.6.1. Available at: <http://www.japantimes.co.jp/news/2017/06/01/national/social-issues/yokohama-mayor-apologizes-boy-bullied-fukushima-nuclear-evacuee/#.WVSOCNTyhPY>

⁶⁶ Comment by a distraught mother at Kobe YMCA Firefly Camp, 2015.6.

⁶⁷ N.M., 2016.9.6

⁶⁸ See for example Anzai, I., ‘Scientific and Social Aspects of the Fukushima Nuclear Disaster’. English version translated by Stephen Suloway, 2012; Fukushima Booklet Publication Committee, ‘10 Lessons from Fukushima: Reducing risks and protecting communities from nuclear disasters.’ *Issues*, March 11, 2015.

but some argue that for marginalized groups, using stereotypical assumptions about identity strategically can be a useful political tool for gaining recognition).⁶⁹ Strategic or not, since the 1950s the language of gender essentialism has made room for women and perhaps also motivated them to become involved in anti-nuclear politics. In the wake of the Fukushima accident, similar arguments have been used to mobilize women to oppose nuclear power. Given the overwhelming preponderance of men in science in Japan, it comes as no surprise that the experts both for and against nuclear power tend to be men. However, both in the 1950s and today, it is largely women who have carried out the everyday work of opposition, calling for transparency, disclosures, compensation and health measures to protect children now and in the future.

On the surface, it would appear that to the extent that ‘womenasmothers’ remains a relatively unthreatening argument useful for making room for women in the world of misogynist and patriarchal politics, it is being used as a form of strategic essentialism, one of many entry points for becoming involved in social movements. This of course can have a powerful impact.⁷⁰ In the words of A.M., ‘It’s not about motherhood. It is about people being responsible to protect children.’⁷¹

To the extent that women and girls value their role as reproductive citizens, it is hardly surprising they would worry about the effects of ionizing radiation, even low doses. And it takes little imagination to understand why women would be motivated to take their children and leave, and perhaps also why they would try to fight for their right to do so. That they would use the discourse of ‘mothersandchildren’ to do so matches general understandings of gendered performativity; mothers try to protect their children.

The Fukushima disaster has, however, brought some interesting changes in the ways women view themselves. Almost every woman I have met who has been affected by the Fukushima disaster told me that until March 2011, they had no interest in politics, protest or nuclear issues. Of course, I am far less likely to have met and had extended conversations with those who have not become politically involved. For most of the women I have met, the experience of Fukushima has been a life-changing event not only because it forced them to relocate, at least temporarily, and to gain expertise on nuclear issues, but because it has changed the way they understand themselves as women and as citizens. ‘If the disaster hadn’t happened, I wouldn’t be thinking about these things. Not just nuclear power, but many things that are happening in the world. It changed how I think.’⁷²

It is extremely difficult for women, particularly women with minority views, to be active in politics in Japan. Being elected not only requires money, connections, and being able to move in the masculine world of Japanese politics, but it requires taking on the nuclear village – a task few if any are able to do successfully. Protest after the disaster is perhaps best symbolized by an anti-nuclear tent established outside of the Ministry of Economy, Trade and Industry after the accident which lasted five years until it was razed by police on 21 August

⁶⁹ See, for example, Spivak, G., (Landry and MacLean, eds.), *Selected Works of Gayatri Spivak*, (London: Routledge, 1996); Carpenter, C., ‘Gender Theory in World Politics: Contributions of a non-feminist standpoint?’ *International Studies Review*, 4: 3, 2003, 153-66; Smith, D., ‘The Problem of Essentialism,’ in Skjelsbaek and Smith, eds. *Gender, Peace and Conflict*. (London: Sage, 2001); Butler, J., *Gender Trouble*. (London: Routledge, 1990). Arguments among feminists about gender essentialism come from a variety of political and theoretical perspectives. All address in some way the question of diversity, asking whether it is possible to put all women into a single category of ‘women’ and examining how that category is constructed.

⁷⁰ For example, an anti-nuclear governor was recently elected in Niigata Prefecture. All of the people I interviewed said the victory was made possible by the large number of women supporters whose interest in politics began with the Fukushima accident, but deepened as they realized how politics affects their lives.

⁷¹ A.M., 2016.9

⁷² M.O., 2016.9.24

2016.⁷³

One method of public resistance is filing suits against the Tokyo Electric Power Company (TEPCO), the power plant operator, and the Japanese government.⁷⁴ These cases attract media attention and provide a platform for discussion. At present, there are many such lawsuits throughout the country, including one brought by crew on US naval vessel Ronald Reagan.⁷⁵ There are many women among the plaintiffs, many of whom are evacuees and who have children. It has been a politicizing process for many of them. R.K. joined the Kyoto lawsuit in March, 2016. She explained that becoming involved in the lawsuit also gave her access to other evacuees, and said it has been an empowering experience. ‘I’ve never been involved in a peoples’ movement before. I just wasn’t interested. The more I learn, the more I understand how backward Japan is – weak people are just left to fend for themselves. So it is important to organize. Everyone needs to do what they can, even if in the end we don’t win.’⁷⁶ R.K., A.M and others have also recently been very involved in action to prevent local governments outside of Fukushima from cutting off subsidies for evacuees as of 31 March 2017. This includes not only gathering signatures for petitions but actively working to inform people of their situation and gather support through social media, print media, exhibits and other methods.

The petitions seek continued support for housing and other aspects of everyday life. But the real objective of these actions as well as the lawsuits is to establish the right of all people to seek refuge, not just those officially told to do so. The argument is that people should not be forced to live in irradiated areas but should be allowed to make their own assessments of safety for themselves and their families. Unfortunately, it is much easier to become part of these lawsuits if one is living away from Fukushima. N.M. told me that she would like to apply for ‘refugee status’ so that she can officially leave Fukushima.⁷⁷ This might sound surprising to some, but Y.C., a supporter of evacuees in Kansai, runs a study group in English for evacuees. They learn English, and also learn about radiation. She told me that the real reason she started the group was so that if the evacuees decide they need to leave Japan, they will still be able to tell their stories in their own words.⁷⁸

Public resistance from within Fukushima Prefecture is difficult. M.O. suggested that the only way was to put international pressure on Japan.⁷⁹ A unique and powerful form of resistance using art is that employed by S.A., an art teacher at a high school in Fukushima City. Unlike most cases where mothers worry and fathers are complacent, S.A.’s partner is not concerned about radiation, although he was able to convince her to take the children and re-locate for several years. They are now re-united and living in Fukushima City, where S.A. continues with his activities but does not discuss them at home.⁸⁰

⁷³ ‘Anti-nuclear activists’ METI camp razed in darkness after years battling over Fukushima,’ *Japan Times*, 2016.8.21, Kyodo news service. Available at: <http://www.japantimes.co.jp/news/2016/08/21/national/anti-nuclear-activists-tents-forcibly-removed-economy-ministry-premises-years-long-battle/#.WArJy-WLTm4>.

⁷⁴ For information on the compensation system, see for example, ‘Japan’s Compensation System for Nuclear Damage: As related to the TEPCO Fukushima Daiichi Nuclear Accident,’ OECD & NEA, No. 7089, 2012. <https://www.oecd-nea.org/law/fukushima/7089-fukushima-compensation-system-pp.pdf>

The government is now talking about putting a ceiling on damage awards.

⁷⁵ According to a 2015 article, there are at least 20 lawsuits involving over 10,000 plaintiffs.

<http://toyokeizai.net/articles/-/80695>. For information about the U.S. naval claims, see:

<http://www.hiroshimasyndrome.com/fukushima-commentary/fukushima-commentary-13.html>

⁷⁶ R.K., 2016.9.21

⁷⁷ N.M., 2016.9.21

⁷⁸ Y.C., 2017.1.20

⁷⁹ M.O., 2016.9.21

⁸⁰ Interview with S.A., 2016.9.21, Fukushima City

After the disaster, S.A. took his camera and began photographing bags of decontamination waste in the midst of populated areas. He has continued to do so for over five years and has tens of thousands of photos. The photos show in a way that words cannot describe the uncanniness of the situation; people are going about their lives in the midst of black bags or green plastic sheets covering black bags filled with decontamination waste but they are not paying it any attention. Moreover, his photos show the total impossibility of the task of scraping and washing everything so that no radiation remains. S.A. has published a book of his photos and is frequently asked to do exhibitions and lectures outside of Fukushima.⁸¹ For the most part, S.A. remains silent about his activities at work and at home, although he is happy to share if someone shows interest.

I have interviewed S.A. several times since 2013. At first, he was focused on finding a way to leave Fukushima, worried that his family was not together, and in his words, 'edgy'. He seemed somewhat bemused by the attention he was getting as an artist, claiming not to define himself as one. He was always careful to point out that everyone should be free to draw his/her own conclusions about radiation.⁸² A year later, he had been reunited in with his family and told me that he should be happy and settled, but did not feel that way.⁸³ He is now willing to see himself as an artist, and sees his work as a record for future generations so they will know what happened. Fukushima, he says, was not evacuated because of the logistics of moving population of 300,000 people and the economic impact of a contaminated area on the Bullet Train line were too intense to even consider.

For S.A., bio-citizenship in Fukushima is determined by a map that is steadily being erased; he sees the purpose of decontamination as making it possible to claim that nothing happened. In response to my questions, he told me that for the first year after the disaster, 'decontamination' was conducted under various euphemistic names. After a year or so, signs began to use the word 'decontamination' and it became a household word. Now, he says, it is slowly disappearing from people's everyday lives and vocabularies. He showed me a photo of a marathon held in a park where runners from around the country raced past a temporary storage area filled with black plastic bags of decontamination waste. He had told me previously that he used to run but had stopped after the accident, so I asked him if he was still not running. He said that since his daughter was made to run at school, he thought it would be strange for her if he continued to refuse so he runs a little bit, but wears a mask. This is just one way that the discourse of normalcy is replacing that of emergency. 'The nuclear power plant accident is similar to war in that people try to erase the reality from history. I'm making a record of what they are trying to erase.'⁸⁴

It was drizzling as we got out of the car to photograph yet another site; a green sheet covering the bags of decontamination waste in an alley between several apartment buildings in a tightly built residential area. When I asked S.A. whether it was OK to leave our umbrellas, he shrugged, saying he thought we had a while before it started to rain hard. When I said that my question was about radiation rather than whether we might get wet, he replied with a bitter smile. 'I've gotten so normalized I didn't think about that.'⁸⁵

⁸¹ Akagi, S. *Fukushima Traces, 2011-2013*, (Osris, 2015).

⁸² Interview with S.A., 2015.8.9, Fukushima City

⁸³ S.A., 2016.9.21

⁸⁴ S.A., 2016.9.21. In March 2011, I posted a notice on the website of the graduate school at which I work entitled 'Radiation Information'. It was for international students who had left during the disaster and were worried about whether to return, and contained links to several official disaster information sites. After less than 24 hours, the notice was removed and I was told that it was inappropriate to use the word 'radiation' because no other institutions were using it. I was able to avoid the problem by replacing 'radiation' with 'disaster'.

⁸⁵ S.A., 2016.9.22

Conclusion

After the Chernobyl disaster, the newly independent Ukraine constructed its legitimacy and autonomy through de-valuing Soviet responses to the crisis and creating a huge social service and scientific network to support sufferers. The degree and quality of access to this network for Ukrainian citizens is dependent on their radiation 'dose', and sufferers have developed techniques to arrange the numbers in their favor, they are at once powerless and powerful in the bio-politics of post-Chernobyl Ukraine. In contrast, far more territory and citizens of Belarus have been contaminated, but are given much less attention and compensation.⁸⁶

In Japan, post-Fukushima bio-citizenship is based not on dose but on location – where one was when the official map of contamination was drawn. Pressure by concerned citizens, including many mothers with post-disaster expertise on nuclear exposure, has successfully enlarged the contours of the map to include some other areas with regard to health benefits. At the same time, 'successful' efforts for decontamination are being used to return the map to close to what it was before the Fukushima Daiichi disaster. Distance and barricades can reduce exposure to radiation and make people safer, but radiation cannot be made safe. Numbers and disclosures about levels of contamination can make people feel safer, but such disclosures can also hide numbers that reveal unsafety. In Japan, decontamination and numerical disclosures are being used to make people feel safe, in spite of alternative media reports and live testimonies of experienced negative effects of radiation. The good Japanese bio-citizen believes in the numbers and assertions of safety; one important form of resistance has been to take ownership of the numbers and decide for oneself about what is, and is not, safe.

In general, if a person lives in an affected area, she has learned to ignore the signs that contradict the return to normalcy. If she has never lived near the designated affected areas, especially if she lives in western Japan, she has likely begun to forget that there was ever a problem. Fortunately, lawsuits advocating the 'right to evacuate' and demanding TEPCO and the government take responsibility and the small but steady voice of evacuees and anti-nuclear citizens continue to keep the issue alive, albeit in the background. The Tokyo Olympics is scheduled to be held in Japan in 2020, just two years from now. Discussions are underway to hold events like softball and maybe even surfing in Fukushima. Every day, about 7,000 workers at the incapacitated plant are struggling to get the situation under control. An extravagantly expensive and technologically innovative ice wall intended to keep contaminated water from leaking out of the plant into the sea is not freezing as planned. The government still insists that there is no danger. Will the Olympic surfers agree to find out if that is in fact the case?

Cancers are being discovered in plant and decontamination workers, as well as children who were exposed to radiation from the initial explosions, and live surrounded by low-level radiation on an everyday basis. Biological citizenship (e.g. receive health benefits and otherwise don't discuss it) in Japan after Hiroshima and Nagasaki was made easier by the Press Code, that kept what had really happened in those two cities from the eyes of the Japanese public and the world for the first seven years. When survivors began to tell their stories, the focus was on war and weapons rather than the 'peaceful atom'. Today, the media has taken over where the Press Code left off. Biological citizenship in Fukushima is silence, and increasing 'evidence' that nothing serious really happened.

The stories introduced here are from just a few of the many people whose experiences belie the assertions that nothing serious happened and that everything is back to normal. Each story is unique, but they share a process of resistance in the face of the unknowability of the

⁸⁶ Petryna, *Life Exposed*.

impact of exposure to radiation. Most of the people introduced here had no prior interest in nuclear power and assumed that it was perfectly safe. For some, what began as a struggle for personal safety has grown into one that encompasses the safety of known and unknown others through public acts of resistance including lawsuits, petitions, protests and other actions. Others engage in private or personal acts and decisions. This new politicized subjectivity is built on small acts of everyday life but differs according to location and circumstances. It is fostering a new awareness not only of the dangers of nuclear power, but also the importance of political action.

It remains to be seen whether the minority voices in Japan will be successful and be heard; if not, perhaps Japan will become a country where biological citizenship is determined by symptoms. Or, along with decontamination technology, maybe Japan will also lead the world in cancer treatment. If not, then perhaps it will become a country where only those with high resistance to radiation survive.

Photos



(1) This temporary storage area is located behind the Fukushima University campus in Fukushima City. Each black bag weighs one ton. When I took this photo in September 2016, it was still under construction and it presumably it will be filled and covered over the top.



(2) The light-colored parts of this wall have been decontaminated, but the places that are too high to reach or cannot be reached with a scrubber have been left untouched. (Fukushima City, March 2017).



(3) Decontamination workers scraping the soil next to vegetable and rice crops. The vegetables and rice will be sold. The decontaminated soil will be added to a nearby pile of black bags and covered with a plastic sheet (Fukushima City, September, 2016).