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Film Review Essay, 14 Feb 2018

The Pedagogical Work of Film for Technology Disaster Studies:  
Reassessing Fukushima through Film

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Consider two brilliant, complementary, documentary films, both finished in 2016-17, both set diegetically five years after the 11 March 2011 (“3.11”) Great Eastern Japan Earthquake, tsunami, meltdown and radiation release of the Fukushima Daiichi nuclear reactors. *Healing Fukushima* (2016-17) is filmed and directed by STS scholar, and EASTS contributor, Sulfikar Amir of Singapore’s Nanyang Technical University (NTU). *Furusato* (2011-16, winner of a Leipzig International Film Festival Golden Dove) is directed, written, and filmed by Thorsten Trimpop (now of the School of the Art Institute Chicago; coproduced with Tobias Büchner). Both films are motivated by their director’s life histories: Amir by his experiences with the anti-nuclear movement in Indonesia, about which he made his first film, *Nuklir Jawa* (2012), part of a long term engagement with Southeast Asian wariness about efforts to build new nuclear power plants in Vietnam and elsewhere in the region; Trimpop by childhood memories growing up in Germany in the shadow of Chernobyl’s level 7 nuclear disaster.

As a teaching tool, *Healing Fukushima* begins with logistics (opening with a road map of evacuation routes that we navigate through in a car; trains; busses), moving through the built and cultivated environment (agrarian, modern urban), local physician actor networks (doctors, nurses, student interns), and affects (melancholy, nostalgia, determination, commitment to patients, everydayness of life continuing).

Hosted by EASTS as part of the Society for the Social Study of Science meetings in August 2017, *Healing Fukushima* was given its Boston premier at MIT,

followed by a lively panel and audience discussion. Scriptwriter and Japan scholar Shi Lin Loh (now of the History Department of the National University of Singapore, NUS) joined the discussion via video link from Tokyo. The credit list — editing by Zaid Salihin; produced by Lisa Onaga and Mike Douglass — demonstrates, among other things, that along with Sulfikar Amir’s dedication to self-taught film-making, and with a little help from one’s friends and local institutions one can produce a film with high production values as well as a targeted STS focus. Douglass was until recently Professor in the Lee Kuan Yew School of of Public Policy and the Asia Research Institute at NUS. Historian Onaga was (until recently) an NTU colleague of Amir, and spear-headed, internationally as well as locally, coordination of materials for teaching about 3.11.

3.11 is a six fold compound disaster, not just the usual three (9.0 earthquake, 14 meter tsunami, level 7 nuclear disaster), but also a communications disaster (what the Japanese government called the “rumor disaster”), a breakdown in trust of authorities, and underlying it all an economy and social feeling of widespread precarity (causing many to accept dangerous work in the clean-up of the reactors). It is these latter social crises that are the focus of STS work, including re-evaluations of earlier dismissals by TEPCO (Tokyo Electric Power Company, the owner of the reactors) of the need for evacuation safety drills; and of fundamental design issues such as putting generators in the basement of reactors where here they were flooded by an unanticipated high tsunami, caused by yet another design flaw, the siting of the nuclear power plant next to, and insufficiently protected from, the ocean.

Technology is nothing if not social. It is also symbolic (as we will see in *Furusatu*), a symbolism that can cut both ways, earlier signaling technical accomplishment, while today a caution.

Sulfikar Amir’s earlier 15 minute short, *A Journey to Namie*, is now a supplement to *Healing Fukushima*. It is about a different town within the evacuation zone. That work, in turn, had been built on years of concern with nuclear politics both in Indonesia (where he chronicled a grassroots movement that stopped site planning for a nuclear plant in central Java in the 48 minute film *Nuklir Jawa*

[*Nuclear Java*] reviewed in EASTS, 9 (2015: 229-31) and Thailand where he had done research on their nuclear establishment.

Pursuing that research agenda to Japan, Amir visited Futaba almost exactly two years before the nuclear meltdown, and been given a tour of the Fukushima Daiichi nuclear power plant. So when the meltdown occurred, he felt an imperative to return, film and write. In a book in progress, he will reflect upon the various vulnerabilities that created the perfect storm of failures of 3.11. Call that the “wide-angled view” which will more deeply situate the film. The film meanwhile is a “close up” of one crucial social component of the response to disaster: the local physician network and their informal mutual help in attending to the health of their communities.

The title, *Healing Fukushima*, comes with an implicit question mark. It is a metaphor for the intense political demands on the medical community, that while technically impossible to fulfill, it must address. Public anxieties constitute a social force, demanding almost immediate reassurance, statistical measurement and prediction. But only slow clinical work over the long term can provide this. In an effort to epidemiologically map potential indicators of vulnerability, 200,000 people were tested, inadvertently adding to the sense that everybody is potentially at risk and stigmatizing, by their peers, those children who were found to have higher exposure numbers.<sup>1</sup> But measuring tumors (by ultrasound, and then surgical slices of biopsies or excisions) cannot be done statistically: each procedure is an individualized choosing of the best angle appropriate to each case. Over time one might compile a register of clinical cases, but doing mass testing in order to collect statistics is a mismatch of method and goal. And yet politically, the government (and governance in a decentralized mode of citizen anxiety and demand) needed statistics to address popular fear, itself a powerful political and social force. This conundrum has become a hot topic of debate among radiologists and physicians over whether such problems lead to likely over-diagnosis of cancers, over surgical response, and iatrogenic side effects. Merely issuing reassuring statements, on the other hand, would have done little to allay fear, and in turn can generate distrust. These conundra hover in the background of *Healing Fukushima* as it focuses on the

front-line physicians' accounts of how they coped.

The film moves back and forth along a cross section from the zone of evacuation to near normal city life, and through locales at different scales of town, municipality, and city. We experience an abandoned local town hospital in Futaba; a general municipal hospital in Minami-soma, a municipality split by the evacuation line, 2.9 km from the coast and 23 km from the nuclear plant; and Fukushima city's Medical University (FMU) Hospital, fully outside the evacuation zone. The physician network spanning these sites constitute front line mediators in the double temporalities of emergency response, and longer-term reflexive organizational learning in preparation for possible future large scale radiation accidents, in Japan and globally. FMU now, like Hiroshima University previously, gets emergency medicine students from around the world, from Mt. Sinai Hospital in New York City to Kazakhstan, Mongolia, and Belarus.

The networks are anthropologically rich ones. They are not indifferent actor networks, emotionally, socially, or politically. The Japanese *wabi-sabi* or *yugen* aesthetic (confronting the brevity of life, its transient and stark beauty, its aging or ruining processes as well as renewals) — an aesthetic both of acceptance and of bravery, stoicism and determination to carry on — can be read in the film's elegiac cinematography (cherry blossom and snow laden trees, curving single track of a nostalgic rural scene) that provide moments of quiet amidst the emotional intensity of the physicians working under tension and anxiety. The doctors are not outsiders like the much maligned experts from Hiroshima and Nagasaki,<sup>2</sup> but themselves local residents who chose to stay, suffering the same kind of exposure and risks as the people they treat, or in the case of two of them who came from Nagasaki, they came to stay out of a family connection to the atom bomb survivors or had absorbed that connection by doing their medical training in Nagasaki.<sup>3</sup> The only difference from the local population, says scriptwriter Shi-lin Loh, is how they construct their risk perception. Situated, partial knowledges constitute a differentially distributed landscape.

For the physicians, it was self-assembly of vocational and friendship networks of expertise to fill in the gaps when technologies fail [nuclear,

communications]. This is not a Latourian network, but rather the response to the failures of Latourian networks, at least of the Aramis or Pasteur sort (recruitment of actors and actants to bolster or capture official institutional projects). Neither is it quite a fully do-it-yourself (DIY) democratic network like becoming a patient-expert, or a citizen-expert or a parliament of things deciding on matters of concern (as would be the hope for the forming of self-help citizen groups in the aftermath of the nuclear meltdown).<sup>4</sup> But it is a self assembling network of partial expertises, of practitioners in different specialties pooling their knowledge on a need to know basis in the service of emergency medicine, reallocation of responsibilities, and adherence to a professional ethics of service to patients and community public health. It is thus perhaps a Weberian network in the sense of his essay on “Science as a Vocation” (with the stress on figuring out how to measure technical things, establish truth to the best of current abilities, and formulating actionable policy based on evaluating probable futures). Some technological networks did continue to work well: we see a transfer from helicopter to ambulance; we see the fast train between Tokyo and Fukushima City. But loading elders on evacuation buses came with the unanticipated death of fifty of them in the process, more than if they had been left in place for a time. There had been 2,200 inpatients and elderly people at nursing care facilities close to Fukushima Daiichi. The government ordered immediate evacuation by buses and police vehicles. Without adequate preparation, hypothermia, deterioration of underlying medical problems, and dehydration took their deadly toll.

In the film, the physicians tell us how they had to learn quickly about radiation and its possible slow accumulative effects over time, how they dealt with the shut down of their clinics and homes in evacuated areas, negotiate relatively reassuring (to themselves) screening measurements against people’s impossible-to-allay fear of future cancers, and deal with the pressure to keep up a professional demeanor. This is the “peopling of technologies” at its most intense, not unlike the Ryan McGarry’s 2014 documentary film, “Code Black,” about Los Angeles County Hospital’s emergency room, while he was an ER doctor in training. Emergency physician Reiko Okubo notes in the film that among the resident doctors there were

women with children who had to decide whether to stay to give medical care or prioritize their children's safety and evacuate. Those who decided to stay drew up a rotation schedule to cover all the duties. She herself is pregnant, and has to decide, eventually concluding that, "As for myself I think the risks of giving birth here and raising a child here are the same as elsewhere" [melancholy piano music].

"How shall I put it," says Registered Nurse (RN) Koji Yoshida, "I had intense anxiety; but although I felt anxious, this [intense] anxiety was something I only later realized I had felt then." In the meantime he was focused on his commitment that if there were casualties, medical professionals had to go to them. He had had a year-long course on radiation, which only made him more anxious to know the details of conditions in the stricken plant. But General Surgeon and Emergency Physician, Dr. Arifumi Hasegawa, notes that even if they had more precise information, they still would not have known how much exposure was happening to their patients or themselves. "You could say," he says, "we had no way to figure out how to forecast risk." While reading up as much as he could on radiation, he called on a radiation technologist to work with him in a buddy fashion. "I would conduct medical treatment, but with regard to radiation and risk assessment I could not do it myself [we see various books on his shelf, including *Annals of the ICRP*,<sup>5</sup> *Planning for Community Resistance; Chernobyl; A New Challenge of Radiation Health Risk Management*]. I didn't have the ability or knowledge to do so. So if I happened to be in a dangerous situation I requested he [the radiation technologist] alert me to it, and in this way I attended to patients with this radiation technologist at my side." Japan's radiation emergency medical system, he notes, aimed to address work-related accidents, not large-scale compound disasters like Fukushima Daiichi [melancholy piano]. As a result, six hospitals designated as primary radiation emergency hospitals failed to function properly after the accident. The Futaba hospital, 4 km from the nuclear plant, had been designated to deal with radiation accidents of the workers in the plant. This was different. But it is not as if there was no preparation: Dr. Tomoyoshi Oikawa, of the Minami-soma Municipal General Hospital, notes that they did annual drills at that hospital in preparation for radiation disaster, and they stockpiled various Geiger and other detection meters.

When 3.11 occurred he was able to set in place a series of measures including health support and counseling services for the four evacuation shelters in the municipality, and five months later obtain whole body monitors to measure internal exposure.

One of the real delights of the film is Dr. Hasegawa allowing the camera into his classroom and along on a field trip when he tries with humor and charismatic flair to bring his interns, three young women and three young men (as well as we, the viewers), up to speed. Sitting around the table, and noting the difference between situations involving radioactive substances and situations involving biological effects of radiation, he asks, "So today we have a little five year old boy, Shiori. "Can someone explain the difference between radioactive substances and radiation to this five year old [21:57]?" A young man tries, and stumbles, "Shioiri, radioactive substances are . . . [stalls]". How would a five year old put it, Hasegawa prompts and turns to a woman, "Big sister, you try." She begins, "Radioactive substances are [pauses] things that give off radiation" [laughter]. Hasegawa: "But what is radiation." She tries again, "Radiation is [pauses], there is Godzilla, right? and Godzilla shoots out beams [gesturing arms outstretched from her eyes], right? The beams are radiation, and Godzilla is the radioactive substance." Hasegawa turns to another male: "your turn: please analogize radiation to poop." The young man says somewhat scholastically, "The amount of poop is like becquerls and the intensity of the smell is like siverts." Hasegawa has to bring it down to earth, but in the end concludes, "Right then, here we have two kinds of machines, one that measures the amount of radioactive substance, that is the unit of becquerels; and another that measures the amount of radiation that produces biological effects in sieverts; please think about which device measures which quantity."

Out in a parking lot with Geiger counters, Hasegawa has the interns practice taking sampling measurements. He takes some grass samples, folds it in a paper napkin and casually says, "Rinka, here put this in your pocket and hang onto it, you Ok with that?" "But it's radioactive." "Well this much is fine." Five years ago, he wryly notes, people might have thought putting the grass in their pocket, the area around the pocket would be in tatters. Common sense changes, albeit slowly.

Back at the seminar table, Hasegawa drills them on the varieties of radiation, and how many centimeters of a barrier is required to stop Cesium 137, which is scattered throughout Fukushima. (Older Americans will remember the Cesium 137 scattered among the “down-winders” of the American midwest in the 1950s.) The white hazard protective suits: do you think those suits can stop gamma rays? No, they can't. They experiment to see that paper can stop alpha waves, iron blocks beta waves.

*Healing Fukushima* contains lively touches, not least is the drumming of six young (three male, three female) Suwa Shrine Festival Drummers, that as an anthropologist, for me, points to, is a reminder of, other forms of ritual and communal repair operating beyond the direct gaze of the film (see below); and, more subtly, plays into the alternating sonic and visual tracking of the film's structure. As one of the audience put it, “I'm so glad you (MF) mentioned the drumming, because the other thing that I noticed was that you (SA) paired it so well with the Geiger counter, the different rhythms, they provide the soundtrack and the heartbeat of this film, one from a technological age, and one hearkening back to a more traditional cultural rhythm.” The elegiac shots of the old country train, for instance, alternates with the crisp modern hospital scenes, the old abandoned JR Station in Futaba with the fast train at the Fukushima City station and the flow of people crossing the public square in front of the station day and night, passing a statue of a pianist in the center. As disaster historian Scott Knowles, one of our panelists put it, “we see Geiger counters, security checks, patients on stretchers, white lab coats, a book on the shelf titled Chernobyl . . . worst case scenarios, children in front of an outdoor radiation monitor, the visit to the Futaba Kosai Hospital. These are terrifying things. You overlay it, it is a very cautious presentation, you overlay it with calming music.”

The visuals have their own rhythm, helping to plot the emotional arc of the film, keeping the talking heads from seeming static, providing signs of everydayness (life goes on), showing the paradoxes that surfaces mask underlying difficulties. Thus the neon lights of restaurants and their ads flash up when life-style diseases

are mentioned; a children's playground is shown while someone notes that 70% of evacuees report sleeping difficulties, 15% mental issues.

One of the audience, a volunteer who had gone to Japan to help, felt the film lacked anger or emotion, but as Shih-Lin Loh pointed out, for a film by foreigners the doctors wanted to put on their most professional face. Still, "if you pay attention to the visual cues, when you are watching [Hasegawa's] face, particularly towards the end, there's a poignant moment when he covers his face with his hands, and presses down, a visual indicator of both the physical and the emotional and mental strain." And there is the segment towards the end in which we are looking with Dr. Shigetomi at his clinic through the sealed glass door and window as he reads off the reception signage all the different specialties once practiced there, and then points to his house nearby. Shi-Lin Loh reminded us: "He lost both. He lost his whole clinic and he can also not go back to his house. And his family was also personally affected, and so this is one of the things that, you know, we used to complicate the viewer's understanding, while at the same time giving the first responders a face and letting them, and everyone who watches hear their voices, speaking for themselves."

Thorsten Trimpop's film *Furusatu* complements *Healing Fukushima*. The title reinforces the emotional turmoil. "Furusatu" means "home," or "Heimat" for Germans, but its special valence is the landscape one grows up in, and also the last scenes one sees as one is dying. In Meiji discourses, and early films, it was valorized as the village and countryside, serving to as a counterpoint to big city alienation and corruption. *Furusatu* has a quite different set of characters than *Healing Fukushima*, showing us how a teen rocker, a media-savvy activist, a conflicted TEPCO engineer, and a female horse breeder cope with the loss of their communities and the unseen danger of radiation. While *Healing Fukushima* opens with driving in a car to the area of Minima-soma, Futuba, Namie, and Fukushima City pointing out evacuation routes by both paper map and auto navigation monitor; *Furusatu* opens with a map of the ocean geomorphology around Japan with dots popping red for seismic movements, a constant steady staccato of activity, and then on 2 February 2011 all hell breaks loose, peaking on March 11, and continuing into early April, when the screen goes black.

A second short prologue segment follows before the title come up: train bell tones, corrugated roofs on small buildings passing by, conductor announcement as the camera pans along a deserted town, abandoned cars on the street, a playground with a single swing moving in the wind without child, a toy cat staring from the middle of the road, smashed cars and motorbikes, medium high-rise buildings and the camera pans up towards the sky and the bell tones fade into electronic static. This is a sequence that was built as miniatures. Nothing of what we see here is real. The miniature studio that built this for filmmaker Trimpop is the same studio that was responsible for most of the back drops for the Godzilla films in the early 1970s. The film thus announces its construction, as well as its subject.

The title comes up and a voice tells us we are in Minima-soma “located within the 30km zone around the crippled Fukushima Daiichi Nuclear power Station. One part of the city has been declared safe for human habitation, the other is a strictly guarded evacuation zone.” We follow people emerging from busses and being given dosimeters to enter the evacuated zone, with strict instructions to be back by 2:15 pm. We ride with a family to their former house, and follow a teenager to the room with his drum set and a garage with farm equipment. They try to start the tractor: it sputters but does not start. The boy will later say, “We have to adapt, but I know I will always need to be ready to leave again.” Most of his friends have already left, and there are brief scenes of him and a couple of friends playing loud music while he sings/screams his rage and frustration. He will finally decide to leave too.

I will deconstruct the film into its key scenes and characters to focus on the work of the film for social analysis (in a world of mechanical and digital reproduction, of course). There are five more key character/scenes beyond the above pressures on the young to leave: There is first the activist who stands in for rage against the “nuclear village” (the government-nuclear-academic complex which has lost so much trust during the crisis, the fifth and arguably most important of the six-fold compound disaster). He is a figure not unlike the well-meaning activist in the audience at MIT who wanted to see more anger from the doctors. Among his interventions is his effort to stop a children’s race on the grounds that the government is lying about radiation levels and it is in fact not safe for the children to

ingest the air so vigorously, especially on the highly contaminated (according to him) track. He hands out facemasks to the children. But the race is part of a ritual event, held to assure people that everyday life can go on, and staged with children lined up before the race in their school uniforms poignantly singing, “We will not leave, we want to save Fukushima, we will live on.” In the emotional excitement, the official starts the race off, only to have to call the runners back, so that the samurai can ceremonially blow their conches to properly invest the race with its symbolic aura.

Second, there is a powerfully uncomfortable scene with foreign journalists trying to squeeze sentimental pathos out of a reluctant sixty-year old who says his family has lived here for “over a thousand years”, sixteen generations (at 30 years a generation, 16 generations is roughly 480 years); and so of course he is staying. While some viewers have questioned the ethics of the filmmaker in being complicit in filming this scene, it does work as a metacommentary on the circuitry of the media both in justifications of the fourth estate’s aspiration to inform the public, but equally in all too often forcing reality into sentimentalized conventions rather than taking the time to explore the feeling structures of the people filmed.

Third, there is the young daughter (Miwa) of a horse breeder who refuses to leave despite her father’s urging (even though she sees he can no longer manage the horses). Her segments of the film are crucial in two ways: first of all she provides access for the powerful visual evidence of the radiation illness killing the horses (a counter to nuclear scientists who say there really has been no death or damage, only panic); and secondly she helps her father prepare for the stunningly beautiful samurai festival, an annual event, staged now defiantly to keep local spirits up.<sup>6</sup> (The film is worth the price of entry just for these festival scenes.)

Miwa picks up hay with pitch fork, calls to the horses (“lunch time!”), and points out two foals, saying she is sure the one is already sick. She struggles to pick up the other and take him in the truck back to the house to give him a bath, singing to quiet him, “there are no ghosts . . . it is all a lie.” We see her next with an electric cutter cutting fresh grass for the horses; her father admonishes her to put on a mask, the radiation is high (he’s without mask). We see him riding a saddled horse

and being thrown; he calls to her to catch it, and then lets it exercise fenced in yard, holding on to its rope. Miwa muses that she has to stay, that she wants to stay, to learn all the skills to take over the horse farm inherited by her father down four generations, she will be the fifth. Her parents worry that she is young and if she has children, they might be deformed, and that would be hard to deal with. Miwa observes that her father cannot do all the work alone any more, and that he no longer protests at her staying.

In penultimate climax sequence of this story line, one of the colts has gone lame. Miwa says others had the same thing, and after a month or two they died, it always starting with the hind legs, maybe something neurological. They cannot get up. We watch a grown horse sitting on the ground, trying a couple of times to stand, but his hind legs give out. The father comes with a backhoe and nudging the horse, it makes a sudden effort and manages to stand. The father speaks bitterly of wanting to bury the dead horses, but the government wants him to leave them until they can do an autopsy, but in the meantime they become skeletons. He says he is sad, feels empty: "Seeing foals is hope, but there is no hope. It is a life of tears, no joy, no hope."

The final scene in this story line has the father putting on a samurai costume, and practicing conch blowing. Miwa helps him put on his head band. The comment, "No it's not right; it wasn't right last year either" sounds more general than just about the headband. But finally he is on one of his horses, riding alone, lonely but determinedly, into town, holding a flag emblazoned with a proud calligraphic horse. Others arrive in their own gear from every direction. Men carrying a mobile temple on a palanquin. The activist is there too in a face mask. There is the release of a kite and the samurai on horses scramble to grab it as it descends. A horse race follows, and a parade of horses with standards. Children's race, kite, conch blowing, horse race, and parade form a complex juxtaposition of history, hope, determination, ritual effervescence and re-bonding of community.

There are three more interlinked powerful scenes and story lines: two compose the paradoxical symbolism, made by time into a still unresolved contradiction and deep political struggle. As mentioned above, the symbolism of

nuclear power cuts both ways. Forty-three minutes into the film, there is footage from the installation of the reactor, the great concrete dome hanging in mid-air. There is an aerial view, and a view of the crowds looking up in pride and hope. And then there are scenes of trying to decontaminate the land (in the front yard of a small house still inhabited, “put the branches to the side: they are the most irradiated”); and crystal clear overhead shots of acres of squares of black bags filled with the contaminated soil that the government has been scraping away with no clear idea of what to do with it, lined up amazingly enough along the ocean edge (awaiting the next tsunami to wash it out to sea?).

The contradictions are internalized in interviews with a TEPCO nuclear safety engineer who walks the empty streets in the evacuated Naraha Town, south of Minimisoma, where he once lived. He pauses at a deserted school: had he stayed here, his son might have been in the school at the time of the disaster. “I do feel responsible, [and am] soul searching what could have done prior to the quake and tsunami.” Then at his desk, he recounts what it was like for those struggling inside the reactor when the electricity went off and they had to keep going for days without relief. He registers fatigue and fear. Looks down. The poignancy is palpable. He agrees to a trip in a fishing boat out to film the nuclear power plant from the sea. The captain puts out a fishing line, brings up a fish, scales it, slices it up, and the TEPCO nuclear safety engineer eats the “sushi” with chopsticks. “It’s delicious, fresh from the sea,” he says stoically with perfect American accent, and “Home is where you go back to and feel relaxed, feel you belong, safe, happy.” The irony hurts, and the black bags in the radiant sunshine of a glorious blue sky day follow.

An older woman speaks of coming back to leave here to care for a family temple (had it not been for the temple, they might not have returned), and to enjoy the sea and mountains. “It was always a little town with nothing special and nothing charming, but you could fish, and you could find herbs in the mountains.” She says the sparrows disappeared but they and other birds are coming back, and wonders if they know about radiation. She says she and her husband are old, if it takes twenty years for the danger to dissipate it is ok for them, but not the young. Her husband-

priest rings a bell as he does temple rites, chanting, “No eyes, no ears, no nose, no tongue, ...no body, no mind, no color . . . no realm of sight.” She says, “We Japanese are not smart: we had Hiroshima and still we built nuclear plants (tearing) all over the country.”

There is so much more to be said about these two films, but for purposes of a review, it is worth ending simply with a reflection on their contributions to (and their pedagogical potential for) East Asian STS. They work the interfaces of description and analysis differently but in complementary fashion, the one a lovely case study of an expert community and learning organization, of first responders in a classic STS disaster study; the other a fleshing out of the challenges of outsider and insider activisms, the role of local histories [Hiroshima; samurai rites], the imperatives and pressures of community survival, and the role of such important social tools as ritual processes for cultural centering, emotional strength, and community ties.

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<sup>1</sup> The film notes that a thyroid ultra sound survey was launched in October 2011 as part of the Fukushima Health Management Survey in response to requests from the local population. Thyroid ultrasound examinations were provided to all Fukushima children under 18. About 300 children participated. 108 children had positive or confirmed malignancy, and 0.8% needed confirmatory examination.

<sup>2</sup> Dr. Sunichi Yamashita, Professor of Molecular Medicine and International Radiation Health at Nagasaki University School of Medicine’s Atomic Bomb Disease Institute, was the most prominent of radiation experts from Nagasaki and Hiroshima who came to help in the immediate aftermath of the Fukushima Daiichi disaster, and took the brunt of public demonization. But it is he who responded by asking the UN Atomic Energy Agency to help organize a series of workshops for both the doctors in Healing Fukushima and others in learning how to better respond to the public demands. Under the AEA’s Dr. Remy Cheth, himself a radiologist as well

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as historian of medicine, a series of workshops were organized with STS scholars including Gregory Clancey (NUS), Kim Fortun (then at RPI, now at UC Irvine), and myself.

<sup>3</sup> Dr. Kumagai and Dr. Yoshita Kongi are the two figures in the film who fit these two profiles respectively.

<sup>4</sup> See Sternsdorf-Cestina, Nicholas. “Food Safety after Fukushima: Scientific Citizenship and the Politics of Risk. (PhD dissertation, Harvard University, 2014.)

<sup>5</sup> ICRP = International Commission on Radiological Protection.

<sup>6</sup> For more on this, see Fischer 2018: section IV (“Fear of Radiation: Use it as a Torch”) in chapter 14 (“Third Spaces and Ethnography in the Anthropocene”), *Anthropology in the Meantime* (Duke University Press).