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## Finding a place for engineering studies in disaster STS? Creating the STS Forum on the 2011 East Japan Disaster

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During the opening panel at the recent Society for the Social Studies of Science/Estudios Sociales de la Ciencia y la Tecnología (4S/ESOCITE) meeting in Buenos Aires, the 4S president (and editor of this journal), Gary Downey, challenged us to move beyond the traditional linear model of knowledge creation and utilization by reflecting on how many Science and Technology Studies scholars pursue novel ways of acting upon the world through scaling up their scholarship. This critical participation piece describes our attempt to forge an international research forum in the wake of the 2011 East Japan Disaster that constitutes one such attempt to produce scalable scholarship. Inspired by the deep reflexivity of autoethnography, this account examines the tensions inherent to such an endeavor, including the tensions between scholarship and engagement; personal and professional goals; research ethics and different international standards for scholarship; and the desire to make engineering visible versus the dominant STS (science and technology studies) framing of disasters research. This account should serve as a useful guide for others seeking to build international collaborations involving engineering studies, and other similar efforts to produce scalable scholarship.

**Keywords:** East Japan Disaster; scalable scholarship; making and doing; disaster STS; disaster studies; invisible engineer; international collaboration; research ethics; alternative conference formats; blogs; new media

### Introduction

During the opening panel at the recent 4S/ESOCITE meeting in Buenos Aires, the 4S president (and editor of this journal), Gary Downey, challenged us to move beyond the traditional linear model of knowledge creation and utilization by reflecting on how many Science and Technology Studies scholars pursue novel ways of acting upon the world through scaling up their scholarship.<sup>1</sup> Drawing on the performative idiom of ‘making and doing’, this was a clear call to pay attention to the human and intersubjective dimensions of our interactions with the technoscientific world. We might contrast this call against the ontological turn in the history and philosophy of science.<sup>2</sup> Within Downey’s call are therefore the echoes of a common critique found at least since Latour’s fruitful investigations into non-human agency, namely that we must retain a focus on human actors as willful agents in order to understand how we can intervene in the world through our work in

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<sup>1</sup>A video transcript of the opening plenary is available at: <http://vimeo.com/106285283> (Accessed September 10, 2014). For further discussion of scalable scholarship, see, from this journal, Downey, “What Is Engineering Studies for?” 2009.

<sup>2</sup>See, for instance, Hacking, *Historical Ontology*, 2002.

science and technology studies (STS). This will be one such account, namely an attempt by me and several of my close colleagues to forge an international research forum and collaboration in the wake of the 2011 East Japan Disaster.

Given that I am telling this story in this journal, let me point to the engineering dimensions of the disaster. Several days after the magnitude 9.0 earthquake and the associated tsunami inundated the East Japan coastline including the backup diesel generators for the Fukushima Daichi nuclear power plant, US media coverage shifted almost exclusively to the failed attempts to prevent a nuclear meltdown at the plant. For once, instead of engineers being relegated to the background, we saw repeated images of blue work-suited Tokyo Electric Power Company engineering executives giving televised speeches amidst a downward spiral in public confidence.<sup>3</sup> Even from abroad, it appeared that issues of expert authority, bureaucratic accountability, and the embeddedness of engineers in Japan's corporatist economy were frustrating effective communication and action. There were many other overt engineering dimensions to the disaster, beginning with the fact that the prime minister, Naoto Kan, had studied applied physics, and it was said that his own reading of the disaster shaped the response of the Japanese government.

Certainly, drawing attention to the engineering dimensions of the disaster was one of the motives behind our efforts. Along with Gary, Maria Paula Diogo, and Chyuan-Yuan Wu, I have been one of the more active members of the International Network for Engineering Studies (INES), helping to organize 4S sessions, regional INES workshops, serving as an associate editor for this journal, and perhaps most importantly, working over the past several years to build up the Prometheans, the engineering special interest group (SIG) of the Society for the History of Technology (SHOT). My current work on the history of engineering education reform places me squarely within this research network, even as my prior work on the history of computing probed into the phenomenon of the invisible engineer in studying the complex interactions between scientists, engineers, and computers during the formative period of US Cold War research.<sup>4</sup> I currently also chair the Liberal Education/Engineering & Society Division of the American Society for Engineering Education (ASEE).

Still, the moral and ethical dimensions of this disaster – indeed any disaster – preclude any narrow reading of the event. Our efforts certainly were not narrowly limited to the engineering aspects of the disaster. Moreover, it is important to recognize that in any new interdisciplinary field, the first group to colonize a field arrives with diverse disciplinary backgrounds, and commitments, which in my case, were the history of technology and STS. I should also note that while we view our work as scalable scholarship, most of the work occurred within the academic sphere – online discussion groups, virtual conferences, real-life workshops, and the like. What we can say in response was that our efforts all centered on creating an interdisciplinary forum whose scholars were committed to producing policy relevant scholarship, and real-world change. At the very least, this seems consistent with the inclusive definition of scalable scholarship demonstrated during the opening plenary in Buenos Aires.

In any event, while what follows is written for an engineering studies audience, the story dwells in a realm of tensions. It will be about the tension between the desire to

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<sup>3</sup>The televised speeches are best obtained from the archives of broadcast media sources, but the overall bias in media coverage may be gleaned through the headline coverage of the *New York Times* from March and early April 2011.

<sup>4</sup>Aker, *Calculating a Natural World*, 2007. On the invisible engineer, see Downey, Donovan, and Elliott, "Invisible Engineer," 1989.

make engineering visible, and the dominant STS framing of disasters; the tension between the academic orientation of foreign disaster studies scholars, and the ethical commitments of Japanese scholars who felt a moral compulsion to engage more directly with affected populations; and it will be about a tension between personal and professional goals – both the compulsion to act despite what it might mean in terms of taking me away from my work in engineering studies, and the broader challenges of making and doing, or ‘scaling up’ as a form of uncompensated labor. In the end, the engineering dimensions of the disaster will appear underrepresented when contrasted against the other articles in this special issue.<sup>5</sup>

Befitting the new critical participation genre in which this piece appears, this will also be a reflexive account designed to probe into my own actions as a knowing if also confused agent. In this respect, the critical gaze in this study is directed at myself, my disciplinary and professional identities, and engineering studies itself. To enact this reflexive component of the study, I draw inspiration from autoethnography, even if not strictly following the form.<sup>6</sup> As such, autobiographical material will appear as a narrative element, insofar as it serves as a vehicle for mining the intentions behind my actions. Ultimately, I suggest that the tensions of the sort that I describe here are part and parcel to the work of ‘making and doing’. We offer it as one account of what is involved in scaling up our scholarship to become the Gramscian ‘life itself’.<sup>7</sup>

### Background to an acting self

I first came across the idea of creating the STS Forum on Fukushima while speaking with my father who was living in Tokyo. In the hours and days following the earthquake and tsunami, news of the event inundated US media, with the *New York Times* providing headline coverage for what seemed like an unprecedented length of time. But while early footage depicted the 15 m (50') tsunami overtaking the coastal highways in the cities located across the Eastern shoreline, the coverage, at least in the USA, shifted almost exclusively to the failed attempt to prevent a nuclear meltdown at the Fukushima Daiichi power plant. For those of us trained in STS, this was one of our classic case studies materializing itself in real life, where it was impossible not to imagine the complex interplay between engineering expertise, public authority, political culture, organizational dynamics, fuel rods, international relations, ethics, and the visible manifestation of a ‘risk society’.<sup>8</sup> My father had returned to Japan in 1985. In addition to providing me with an opportunity to speak with someone close who had firsthand experience with Japanese corporations and government bureaucracies – he had served as a national research director and then corporate executive after his return – it provided me with an opportunity to connect with my father.

Given that one aim of this piece is to probe into the intentions behind scalable scholarship, allow me to provide at least the elements of autobiography that are directly relevant to the course of events: I am a historian of technology with a Ph.D. from the University of Pennsylvania. While I attended college during the conservative decade of the 1980s, I grew up in Michigan with a group of idealistic friends who remained influenced by the 1960s counterculture. Like many Asian-Americans growing up in an academic household, my strengths were in STEM education, but an Advanced Placement American History course

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<sup>5</sup>Downey, “What Is Engineering Studies for?” 2009.

<sup>6</sup>See, for instance, Reed-Danahay, *Auto/Ethnography*, 1997.

<sup>7</sup>Downey, “What Is Engineering Studies for?” 2009, p. 55.

<sup>8</sup>Beck, *Risk Society*, 1992.

I took during my junior year opened up new horizons. As such, I enrolled in the Science, Technology and Society Program at MIT. There, I was influenced by the anti-nuclear sentiment (and, later, ideas about technological governance) found in Langdon Winner's *The Whale and the Reactor*,<sup>9</sup> as well as the views held by Charlie Weiner, my undergraduate advisor and a historian of science who collected oral histories related to J. Robert Oppenheimer. I also got to know Sharon Traweek while at MIT. I was already attuned to ethnographic observation through the assimilationist strategies found among many first-generation immigrant youth. I was deeply influenced by Sharon's ethnographic approach to the cross-cultural study of scientists.

Because of MIT's degree policies, I earned a second degree in computer science, which allowed me to retain one foot in a technical field. An STS degree did present some challenges in terms of finding a good job straight out of college. I wound up eventually working as a technology analyst at the Microelectronics and Computer Technology Corporation (MCC) in Austin, Texas, a research consortium that was said to be the US response to the Japanese 'Fifth Generation Project' in artificial intelligence. Working within their International Liaison Office provided me with many opportunities to visit Japanese research facilities, as well as play host to Japanese researchers visiting MCC, which despite the overt rivalry was said to be a valuable ally for helping both entities retain their sponsors.

I had decided to study the history of technology rather than STS or anthropology at the graduate level. While I entered the program at Penn intending to pursue a critical study of consumer culture, the history of technology at Penn, as elsewhere, remained a largely conservative discipline captivated by our culture's underlying obsession with technological innovation. While echoes of criticism may be found in my first book, it was nevertheless a study of the emergence of the US institutional apparatus for Cold War R&D, as told through the lens of the history of computing.<sup>10</sup> It was therefore with considerable excitement that my first position was as a lecturer in Rensselaer's STS Department, where Langdon Winner was a member of the faculty. Habits, however, are hard to break. As such, nearly all of my critical engagement since arriving at Rensselaer Polytechnic Institute (RPI) has occurred through means *other* than my scholarship. I have served as the Director of First Year Studies, and have been a member of our Faculty Senate dealing with significant issues related to shared governance. This, along with my work with INES, SHOT, and ASEE satisfied my impulse to act on the world, but in ways that remained significantly divorced from my scholarship.

### **Responding to a disaster**

Specific plans to create the STS Forum on the East Japan Disaster materialized during the 2011 co-located annual meetings in Cleveland, Ohio of the Society for the Social Studies of Science (4S), the History of Science Society (HSS), and SHOT. The abstract deadline for the 2011 4S meeting was, as I recall, around 1 April, leaving only a handful of days for the preparation of abstracts following 3.11. Nevertheless, given the substantial number of scholars who had begun studying disasters after 9/11 and other events including Hurricane Katrina and the BP oil spill, there was a ready community especially in the USA for interpreting the unfolding events in Japan. With a sense of ethical obligation to bring their knowledge to bear on the latest disaster, around two dozen scholars found their way onto the 4S annual meeting program to talk about 3.11.

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<sup>9</sup>Winner, *Whale and the Reactor*, 1986.

<sup>10</sup>Akera, *Calculating a Natural World*, 2007.

Unfortunately, the international asymmetry in disaster research also manifested itself in the 4S program, amplified both by the US location of the meeting and the high level of post 9/11 US national funding for disaster research. The asymmetry was in fact very evident during the 4S/SHOT/HSS joint plenary setup specifically to bring forth different perspectives on 'Fukushima'. During this session, Spencer Weart, Gabrielle Hecht, and Hugh Gusterson gave strong presentations grounded in these senior scholars' own scholarship. But arguably, only Hecht, who spoke on the experiences of the contingent workforce at Fukushima Daiichi, namely the 'heroic 50' who worked to contain the disaster, spoke directly to issues of current concern to those living in Japan. It was also striking that the only Japanese presence on the panel was Yuko Fujigaki, the President of the Japanese Society for Science, Technology and Society (JSSTS), who chaired the session. Fujigaki tried to bridge the gap. It was clear to those of us who could see the signals that Fujigaki was struggling to convey additional perspectives about the disaster that remained unfamiliar to a US audience. Judging from the response of the audience, it remained invisible that the papers collectively dealt with fears of the nuclear that were distinctly 'American' in their origin. (From my understanding, the concern in Japan lay more with the inefficacy of bureaucratic organizations, and how this played into longstanding fears about Japan's economic stagnation; there was also greater interest in the non-nuclear dimensions of the 'triple disaster' that was being eclipsed even in Japan.) Unfortunately, Fujigaki was silenced by her ascribed role as chair rather than commentator, and notably less due to language, which made her subtle interventions visible only to a few. At least engineering, as refracted through the experiences of contingent labor, was partly visible in Hecht's presentation.

I should note, on the other hand, the positive efforts to bridge national boundaries in Cleveland. Perhaps most notable in this regard was the roundtable on Fukushima and Nuclear Power chaired by Sonja Schmid that had something approximating representational parity. Still there was considerable asymmetry in representation, segmentation of topics, and the segregation of Japanese scholars in Cleveland, as documented by my colleague Chigusa Kita.<sup>11</sup> Of the five other sessions on the East Japan disaster, four were dominated by US and European scholars, and one by Japanese scholars. All except the Japanese session foregrounded nuclear issues. All three of the general sessions on disasters, and two of the three sessions on other nuclear issues were dominated by US or European scholars, with the one remaining nuclear session demonstrating something closer to Japanese/non-Japanese parity. In addition, there were two sessions on alternative energy that were US/European or American/European dominant. Engineering was at best sparsely represented. Of the two dozen presentations on nuclear topics, only two of the talks dealt directly with engineers and engineering expertise, with one additional talk on post 3.11 EU policies on new nuclear power plant construction dealing indirectly with questions of engineering knowledge and expertise. The remainder of the papers, in dealing with subjects such as nuclear policy, citizen participation, new media, information flows, risk, radiation exposure, and discursive constructions of nuclear futures were clearly defined by the dominant STS framing of nuclear disasters.

Despite all this, when we spoke with several of the Japanese scholars in Cleveland, they expressed their appreciation that so many scholars had decided to pay attention to the East Japan Disaster. Still, I met with Chigusa Kita and another colleague, Peter Taylor, to lament about the plenary. I had known Chigusa through my prior work in the history of

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<sup>11</sup>Kita, *Situated Questions*, 2012.

computing, and Peter through my fleeting work on ecologies of knowledge.<sup>12</sup> Through an initial introduction that occurred through this latter work, I had become a regular participant in Peter's annual workshop on Science and Social Change.<sup>13</sup> Peter, like Gary, had also been working on building strong international collaborations as well as naturalized sense of normative engagement among scholars. When the three of us sat down to discuss the plenary, we quickly converged on our collective sense that the asymmetric treatment of the disaster was wrong, and that we could do better. This was the origins of the STS Forum on 'Fukushima'.

### **Building from existing networks**

Disaster studies is a field that existed well before the East Japan Disaster, or for that matter 9/11. Indeed, it is a field that in some respects has deeper roots in Japan, given the long history of seismic concerns that permeates the institutional thinking and culture there.<sup>14</sup> Our goals were more specific. Given the all-too-apparent engineering and technological dimensions of the disaster, it seemed that this was an instance where STS and our engineering studies community could contribute to an understanding of the disaster.

I have to admit that at this point our work was animated by no small measure of what one might call academic imperialism. I can honestly say that our primary concern lay with the victims of the disaster and the continuing recovery and containment operations there. We too remained mesmerized by the disaster and its continuing ramifications, and it was, and remains our belief that the disaster scholarship in and beyond STS can help mitigate and prevent the adverse consequences of disaster. It may help communities, officials, and knowing engineers avoid patterns of conduct that are known to be ineffective, or known to produce problems down the line. Our secondary concern lay with advancing disaster scholarship – what as scholars we tend to do best, or at least do most easily. Still, as reflected in both our internal seed grant proposal and our National Science Foundation (NSF) proposal, we also viewed this as an opportunity to demonstrate the relevance of US and European STS and engineering studies scholarship, and to help cultivate and strengthen relevant scholarship in Japan. In fairness (if not exactly in our defense), this is a concern we also hear from many of our Japanese colleagues – especially those trained outside of Japan. 4S held its first meeting in Asia a year earlier under just such a premise: despite the false fear of a significant drop in attendance, 4S decided to hold its 2010 annual meeting in Tokyo in order to encourage the further development of STS scholarship in Asia. (It turns out Tokyo was the third largest meeting to date for 4S.) SHOT is currently having very similar conversations about its 2016 meeting in Singapore. We would discover the problems with this position only in the course of our effort to create the STS Forum on the East Japan Disaster.

International collaborations in the social sciences, especially those designed to serve different national audiences, require far greater modesty. In this respect, the most impressive network that came within our general orbit was Teach 3.11,<sup>15</sup> a 'multilingual guide to academic resources' created by Lisa Onaga and her colleagues associated with the Forum for the History of Science in Asia (FHSAsia). An educational project setup in the wake of the

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<sup>12</sup>Aker, "Constructing a Representation for an Ecology of Knowledge," 2007.

<sup>13</sup><http://sicw.wikispaces.com/NewSSC>.

<sup>14</sup>Clancey, *Earthquake Nation*, 2006.

<sup>15</sup><http://teach311.org/about/>.

East Japan Disaster, Teach 3.11 initially worked to make accessible the large body of secondary, and sometimes primary and popular literature on Japanese history, politics, culture, and the disaster itself that they felt would be crucial for those who wished to understand and teach about 3.11. Done largely through translated abstracts and synopses, Teach 3.11's volunteers work to make Japanese language historical resources available to non-Japanese scholars, and vice versa. As a distributed effort, Teach 3.11 enabled more decentered evaluations of relevance, and assumes no single mode of exchange or scholarship. Teach 3.11 has since then evolved into a general resource for those working at the intersection of the history of science, history of technology, and Asia through the organization and annotation of relevant scholarship.

Our aims were somewhat different than Teach 3.11's, given that we decided to place scholars who were working on the East Japan Disaster in direct contact with one another. Drawing on my prior experience in organizing academic initiatives, but also on my current historical study of academic institutions, I decided to start by pulling together an 'initial planning group' – people I knew who were interested in the topic, and who could help recruit others into the Forum. This included Kim Fortun at RPI, Cathryn Carson at Berkeley, Scott Knowles at Drexel, and a handful of others. The fact that I tapped into existing networks, including INES and the Prometheans, meant that engineering was heavily represented in this selection. It was Sharon who then introduced us to Lisa Onaga's work, and through her, a number of other individuals joined us in our early planning efforts.

The challenge was to bring a similar number of Japanese scholars into the Forum. I immediately wrote to several younger scholars I knew in Japan. After conferring with Chigusa and Sharon about the best way to reach out to senior Japanese scholars, I wrote a note to Dr Fujigaki and Dr Miwao Matsumoto, both from the University of Tokyo, with an invitation but also a request to introduce us to other scholars who might be interested in joining in on the early planning. Dr Matsumoto was the one who responded. We did also write to the other Japanese scholars who had given a presentation on the East Japan Disaster in Cleveland.

In retrospect, I know I should have slowed down the process to ensure that we had full parity within the initial planning group between scholars in and outside Japan. If we had managed to gain full buy-in from our Japanese colleagues from the very outset, the Forum might have taken on a different shape. But here I suspect our desire to promote scholarship, and the asymmetric assumptions embedded therein, held some sway. On the other hand, to be perfectly frank, this would have been a difficult task, given the subtle politics and even ideological differences that divide Japanese scholars and academic institutions. Compounding matters, while I was fairly well known in the Japanese history of technology community, I was less well known within JSSTS. Had the request come from a senior scholar at MIT or Harvard, or even Berkeley, the response might have been different. But here I was, an associate professor with no active research program in disaster studies, reaching out to the senior-most scholars at the top academic institution in Japan. I would not be surprised if there were those who perceived this as a possible instance of empire building (as opposed to the academic imperialism stated earlier). We also did not fully appreciate just how busy the Japanese scholars were in the wake of the disaster. Dr Matsumoto was on a senior advisory committee for one of the 3.11 post-disaster investigations, and there were scholars from many countries outside Japan who were expressing an interest in studying the East Japan Disaster. Dr Matsumoto's reply was highly supportive and polite. He accepted from the outset that ours was an important endeavor, and placed us in touch with Ryuma Shineha and Kohta Juraku, two former Ph.D. students who by then had placements at the Graduate University

of Advanced Studies (*Sokendai*) and the Department of Nuclear Engineering and Management at the University of Tokyo. I might also add, in hindsight, that a very different approach would have been to work through 4S (and possibly SHOT and HSS) in setting up a fully collaborative initiative with JSSTS. This would have certainly ensured greater symmetry. Eventually, we announced our initiative through various research networks – FHSAsia, INES, The Prometheans and the Asia Network (SHOT’s engineering and Asia SIGs), the Tensions of Europe network, and other listservs accessible to the members of the planning group.

### **Drafting an NSF workshop proposal**

Once the planning group was substantially in place, we began talking about the best way to build a new international research network. In following a habituated practice for most academics these days, we quickly settled on the idea that we needed external support for our initiative. We missed the window of opportunity for NSF’s Rapid Response Research (RAPID) grants because of my initial hesitation to act; after considering other possibilities, we settled on submitting an NSF workshop proposal under the Social and Economic Sciences Division’s standard STS program announcement.

Our proposal came together fairly quickly. Cathryn Carson agreed to host the meeting through the Center for Science, Technology, Medicine and Society at UC Berkeley, which she formerly directed. We had considered meeting in Japan, even Fukushima, but someone had suggested that some Japanese scholars were labeled apologists during the heated conversations following the disaster. We therefore reasoned that a US meeting would provide a needed safe space for conversation, and that a West Coast location, especially at a prestigious institution like Berkeley, would be a sufficient draw for the Japanese scholars, as well as those outside Japan. Cathryn’s ability to secure the Lawrence Berkeley National Laboratory as our specific meeting site – she was an associate dean with connections to the nuclear physics community – clinched the deal. We considered Cathryn, Kim (Fortun), Dr Matsumoto, and myself to be the co-organizers and co-PIs, and indicated this in our communication to all participants.<sup>16</sup>

Simply scaling up a research network does not constitute ‘scaling up’ in the sense that Downey has invoked the term. And while it was our intent that the scholarship we promoted would have a real impact on the world, from this viewpoint, seeking NSF funding posed a distinct challenge. Given what we, especially in STS, know about the peer review process, we decided that the proposal had to have a clear intellectual objective. Given Kim’s extensive background in disaster studies, we found it easiest to embrace her efforts to build the field of disaster STS as providing a focal point for the proposal. We argued that the East Japan Disaster, because of its multiple resonances and complexity, would serve as an important interdisciplinary vehicle for articulating key concepts in disaster STS. Coming in as an outsider, I could offer no alternative. While engineering was mentioned in the proposal, it did not occupy center stage. My narrative approach to history precluded analytic formulations about engineering that would draw interest from the NSF review panel.

Our proposal did of course play to NSF’s broader impacts criteria. And we made every effort to indicate that the academic exchange would be bidirectional – non-Japanese

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<sup>16</sup>Formally I was designated the principal investigator (PI), and because this was a workshop proposal with no funds being transferred to the University of Tokyo, we could not find a way to list Dr Matsumoto as co-PI. NSF therefore has him listed as a co-investigator.

scholars interested in the disaster would benefit from the extensive research and field observations about the disaster that was unfolding in Japan, even as Japanese scholars would benefit from the longstanding focus on disasters within the US and European STS communities. But obviously, bidirectionality did not imply symmetry. Indeed, the broader impacts criteria provided a rubric in which to insert our assumptions about being able to help advance STS scholarship in Japan.

While it might be tempting to defer this conversation until later, where it could assume a sterile form as the findings of our study, given that I have brought the specter of intellectual colonialism to the surface, it is best to address this now, and through a full and honest appraisal. First of all, it is patently false to presume that Japanese scholars need greater access to Western literatures. Japanese scholars (along with many others in Asia) learned long ago to canvass Western texts. We discovered, during our efforts, that Dr Matsumoto is far more well-read in the European postmodernist and poststructuralist literatures than many of our own colleagues in the States (indeed, he reads French texts in their original), and while his notion of ‘structural disaster’ does not fit neatly into Western sociological constructs, it is based on an original formulation of the social conditions conducive to disasters, and the pattern of responses that follows from those conditions.<sup>17</sup>

Being partly removed from the inner networks of US and European conversations about STS, Japanese scholars may occasionally approach Western literatures in ways that seem eclectic to an outsider; there may also be the enthusiastic uptake of an idea (like Actor–Network Theory or the Technological Systems approach earlier), or else efforts to combine ideas in ways that those in the US and Europe consider incommensurable. While my knowledge here is extremely limited – this again is not what I study – it would appear that underneath these different readings of the STS literature is a structural difference between Japanese and US academic institutions. While some Japanese universities have begun to shift towards a more ‘American’ model, Ph.D. students and younger faculty often pursue projects within ‘laboratories’ headed up by a senior professor based more on the classic German model. Ph.D. students devote far less time to coursework prior to receiving their Ph.D. This supports the applied orientation of many papers presented not just by Ph.D. students, but also by younger faculty, with the larger, synthetic works being reserved for senior faculty. This being said, many Ph.D. students and more recent graduates in Japan have a mastery of Western literatures that rivals or exceeds many of their counterparts in the USA, given different national norms about studying and scholarship. Relationships with funding sources and both public and private organizations also differ.

We also learned through the course of our efforts that there are different publication venues in Japan that reflect the public stature of scholars and academic institutions in Japan. Thus, whereas peer-reviewed journal articles constitute an important standard in the USA at least for the social sciences, shorter, published conference proceedings from specialized research groups meetings (*kenkyukai*) serve as the common standard for what counts as scholarship in Japan. And whereas quantitative measures of journal output have become a stand-in for academic reputation at least among mid- and lower-tier research institutions in the USA, advisors and institutional reputation still play a major part in academic placements in Japan. There are those in Japan who would like to see more Japanese scholarship appearing in Western journals, in viewing this as important to international standing. Nevertheless, to insist that we develop Japanese scholars so that they produce journal articles that meet Western standards is to insist on an approach that is out of alignment with Japanese academic institutions and their mode of operation.

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<sup>17</sup>See, for instance, Matsumoto, “‘Structural Disaster’ Long Before Fukushima,” 2013.

Also, while there are academic presses in Japan that allow established professors to publish serious academic texts, there is also a significant set of trade presses that publish other texts designed for Japan's highly literate (if sometimes prejudiced) public audience. While those in the West who pride themselves in the quality of Western scholarship may give less credit to such texts, we should think carefully about what these texts represent in terms of scalable scholarship, and their special relevance in an area such as disaster studies and nuclear energy policy. Indeed, despite our scholarly reputation, the US STS community has had rather limited influence over US corporate conduct and science and technology policy. Within engineering studies, those of us who work on engineering education have had more success interfacing with the engineering education community, but the broader scholarship in engineering studies has a level of policy engagement that is probably similar to that of STS. By contrast, there were Japanese STS scholars who were sufficiently enmeshed within political circles to earn the title of being complicit. Others contributed to the disaster investigations. We might compare their situation to the policy embeddedness of many of the STS programs in Europe.

Finally, our NSF workshop proposal required us to specify whom we were going to invite. We quickly agreed that it was our intent for half of the participants to come from outside the USA, and that this should be a meeting open to people of all academic ranks. It was also my intent to open up the meeting to a number of scholars in the broader realm of disaster studies, nuclear policy, nuclear engineering, and civil engineering. While this might have been conducive to the goal of 'scaling up', it was suggested in response that the goal of the workshop was to give articulation to the field of disaster STS. Given the lack of articulation of disaster STS, it was pointed out that having too many scholars from outside STS and other appropriately aligned disciplines could derail the conversation. This was not necessarily wrong. Given the robust discussions about subjects such as resilience that already existed within the wider disaster studies community, or the very different starting point from which most nuclear engineers would have approached the issue, it was not clear that a productive conversation would result from bringing all of the different parties to the table, at least until we had a clear idea of what constituted disaster STS. In the polite type of compromise often struck between academics who respect each other's judgment, we agreed that a very small number of representatives from other disciplines would be invited if only to hold disaster STS accountable for its ideas. Here again, NSF's merit criteria shaped the course of our efforts.

### **Crafting an online forum**

'Making and doing' may have an unfamiliar ring for most scholars, given their imaginaries for that which lies at the heart of the scholarly enterprise. But for many of us in engineering studies, I suspect there is a subtle resonance that harkens back to our earlier engineering, or in my case, computer science identity. In fact, when I began studying STS at MIT, it was my intent to use STS perspectives to design better computer systems, and I had an opportunity to do so as a summer intern at the Office Management Systems Division of Honeywell Corporation in 1984 and 1985. I had worked on something that some might consider to be an early prototype of a graphical browser; moreover, carried out in the context of developing a tool for computer supported cooperative work, some early thinking about what we now call social informatics was built into our designs. We specifically pondered about what it would take to create an electronic journal. Given my background in computing, I had also continued to teach information systems design

as a member of the IT Faculty at Rensselaer, with a focus on the social dimensions of design.

Given the time that we knew it would take for the NSF proposal to run through the review process, the initial planning group quickly settled on the idea of creating an online version of our forum. This meant not only making use of Google Groups listservs,<sup>18</sup> but doing the social engineering necessary to produce robust conversations. In fact, the decision to assemble an initial planning group was itself influenced by the kind of thinking found in Rob Kling's 'What is Social Informatics and Why Does It Matter?',<sup>19</sup> which I occasionally taught to my undergraduates. We then reasoned that the first memorial anniversary of the 3.11 disaster was a key event that we could use to galvanize our community, and to expand our membership. We felt that the technology was there to convene a virtual conference, based on pre-circulated papers that people could read and comment on during a defined conference period. It was Lisa Onaga who suggested the WordPress platform, based on her experiences with Teach 3.11.

The 3.11 Virtual Conference opened at exactly 7 a.m. on 11 March, 2012 JST (6 p.m., 10 March, EST), and was open for a period of exactly 48 hours. We had advertised the event and lined up moderators, with Scott Knowles taking the lead on assembling a set of 'featured articles' that were revealed at the start of the conference. We worked to design the site to maximize conversation and provide broad exposure to different scholars' works. This was done by listing all of the papers on a single page with 10 lines or so of each manuscript visible, while comments could be posted by anyone at the end of the article that people could access via a '[Read More]' link. We had asked people to submit works-in-progress, and to make their posts provocative and relatively brief, so that those new to the study of the East Japan Disaster could enter quickly into a new realm of research without a heavy, up-front investment of their time. The implementation was simple, and entirely within the existing capability of WordPress. The design worked, and generated a running dialog surrounding each paper that many regarded to be amazingly rich.<sup>20</sup>

With minimum modification, this became a basic tool that we employed for the October 2012 workshop in Copenhagen, the second virtual conference in March 2013, and the actual NSF-sponsored workshop in May 2013. Nearly all of the papers from these events can be found at the WordPress site: <http://fukushimaforum.wordpress.com/>

### Expanding the conversation

Given the trajectory we set for ourselves with the NSF proposal, engineering, as content, was sparsely represented in our first 3.11 Virtual Conference. In also reflecting, primarily, the disciplinary backgrounds of those who immediately began studying 3.11, the topics covered – contingent labor, disaster STS, historical memory, Teach 3.11, irradiated foods, social/emotional bonds (*kizuna*), notes from the field, social media, disaster investigations, and victims – dealt only incidentally with the engineering dimensions of the disaster, if at all.

From the standpoint of engineering studies, probably the most interesting event was the workshop on 'Historical and Contemporary Studies of Disasters' held during the 2012

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<sup>18</sup>The online version of our Forum can be found at this link: <https://groups.google.com/forum/?hl=en#!forum/fukushima-forum>.

<sup>19</sup>Kling, "What Is Social Informatics and Why Does It Matter?" 1999.

<sup>20</sup>The papers, and comments posted by the readers, remain posted on the web at: <http://fukushimaforum.wordpress.com/online-forum-2/online-forum/>.

annual meeting of SHOT. Given that SHOT's engineering SIG, the Prometheans, led the effort, with co-sponsorship from Teach 3.11 and SHOT's Asia Network, engineering was surely to have a place within this program.

This being said, the overall tenor of the event requires us to revisit the broader planning efforts that were occurring in the wake of our first virtual conference. Basically, we were still waiting to receive positive word from NSF. Given that the call for papers for SHOT and 4S had gone out months earlier, we decided to use the momentum of the first virtual conference to pull together a program for both SHOT and 4S. Our reasoning, at the time, was that there were both historical and contemporary dimensions to the 3.11 disaster, and that it therefore made sense to organize something for both events. Both meetings were occurring in Copenhagen, but as curiously scheduled two weeks apart. (SHOT and 4S only occasionally hold co-located meetings.)

What made an event at SHOT so attractive was that SHOT had been having trouble getting people to stay for their Sunday morning sessions, so its Executive Council had ceded the entire day to the SIGs. This meant that, under SHOT's then extant policy, we could run a full-day workshop at no additional cost to the participants. (There was a separate one-day registration for those attending only the workshop.) But what we failed to realize was that by bifurcating participation between those who were working on past disasters, and those who were working on the present one, we wound up reproducing the very rift that we intended to bridge between Japanese and non-Japanese scholars. Those who spoke on the Santa Barbara Oil Spill, defoliants in Vietnam, Hurricane Katrina, Chernobyl and other topics flocked to the SHOT workshop because of the promise of a more intensive workshop experience. The sessions that we organized for 4S had a more healthy international mix, but the fact remained that nearly all of the Japanese researchers except three saw Fukushima Daiichi and the broader 'triple disaster' of 3.11 as a contemporary event that was more appropriate to discuss at 4S. Indeed, the topic of 3.11 had been picked up by the Japanese STS community more so than its history of science or technology community, so 4S was already the natural venue for their participation.

To stay with the reflective component of this exercise, I recall being somewhat troubled by the unfolding responses. Our original call for the SHOT workshop actually did not stress the comparative dimensions of disaster, in that we thought it might be possible to bring together scholars who were studying the historical origins of the East Japan Disaster. When we realized that this was something approaching a null set within the membership of SHOT, we quickly broadened the call to include any and all disasters. Desperate to find participants, we broadcast the announcement through the Tensions of Europe network, an active research network for the history of technology in Europe. It should have been apparent at this point what the result of such a call would be. Nevertheless, as a busy academic, already stressed about (if also charged up by) the time it takes to organize such initiatives, it was all too easy to lose sight of our objectives for integration and balance in the attempt to 'make' a successful workshop. In perhaps reflecting a tension found among other over busy academic as well, no one from our initial planning group picked up on the consequences of this move.

This being said, intellectually the SHOT workshop was a great success, representing the best in interdisciplinary exchange. Following a format first developed for the 2006 INES workshop in Blacksburg, Virginia, we organized the event as a pre-circulated papers workshop with no author presentations during the workshop itself. The papers were grouped into four sessions, with each paper being given two assigned respondents. The first respondent helped mainly to refresh everyone's memory of the paper through an emphasis on summary and analysis, while the second filled any missing gaps and extended the analysis.

Each respondent was given just two minutes to talk, so that the bulk of the time during each session was an open conversation among all participants. The four sessions were also set in a particular order, beginning with a study of the natural/anthropogenic dichotomy, disaster preparedness, and nuclear technologies, only after which we turned specifically to the 3.11 East Japan Disaster. In other words, each session was designed to develop ideas that would be instrumental in interpreting the East Japan Disaster.

This format enabled us to pursue lines of inquiry that transcended the individual papers. During the first session, we not only discovered how scholars from various disciplines were breaking down the natural/anthropogenic dichotomy, but how different disciplines ranging from history, anthropology, sociology, philosophy, and environmental studies were contributing to the study of disasters, and pursuing this work in different ways. By the second session, we were playing with concepts that were new to many of us, such as ‘environmental coherence’ and ‘regimes of trust’. By the third and fourth sessions, we were also speaking about the various voids in our scholarship – what remained invisible in our scholarship, specifically because of the disciplinary origins by which we entered this field of study.

I provide no extensive summary of the workshop here, partly because this paper is primarily about scalable scholarship, but also because an extended synopsis of the meeting is posted online.<sup>21</sup> Still, to capture something of the sense of the generative conversation that resulted from our workshop and its chosen format, allow me to quote from one of the participant’s post-workshop reflections, reproduced here with permission:

The most interesting sequence of insights I gained from this workshop is the one encompassed by the concept of ‘regimes of trust’. First of all, talking about regimes of trust enables us to analyze the situation preceding the disaster and identify the elements that created a fertile ground for a state of emergency to evolve into a disaster. These regimes can be shaped by technological optimism, by financial considerations (calculations of cost and gain), or by lack of awareness about the change of environment. All these contribute to a certain psychological disengagement from known risk, and create a specific configuration of ‘risk tolerance’, which varies in different cases. During the disaster, however, existing regimes of trust collapse and leave a void, which is then filled with alternative ‘meshworks’ of trust, leading to such phenomena as DIY movements.<sup>22</sup>

With regard to engineering studies, of the 15 papers at the workshop, four dealt directly engineers or engineering; in addition, engineers or engineering were present in about a half dozen other papers. The four were Phil Brown’s papers on civilian riparian control in early twentieth-century Japan; Ivaylo Hristov’s papers on the Vrancea earthquake and the design of a Bulgarian nuclear power plant; Mats Fridlund’s papers on the engineering aspects of terrorism; and Kenzo Okuda’s papers on the earliest nuclear reactors in Japan. Each receives some attention in the synopsis cited above.

With the 4S annual meeting, we were more successful in getting the Japanese scholars together with US, European, and other scholars outside Japan. Scott Knowles and Ryuma Shineha were in charge of organizing the 4S sessions while I attended to the SHOT workshop, and they were careful to integrate the Japanese and non-Japanese scholars into each of the sessions, including the session chairs and commentators. The four sessions that they organized were on expert authority and risk; citizen science; post-disaster discourses; and social structures and responses to disaster. In addition, those affiliated with the European Association for the Study of Science and Technology organized a session mainly on public

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<sup>21</sup><http://shotprometheans.wordpress.com/workshops/2012-workshop/workshop-summary/>.

<sup>22</sup>Frumer, private correspondence, 2012.

and official responses to the East Japan Disaster outside of Japan. An extended synopsis of the 4S sessions is also available online.<sup>23</sup>

Attention to the engineering dimensions of the disaster at 4S remained modest. Perhaps reflecting as well the tensions inherent to my own interest in disasters, what I gleaned most from the 4S meeting was a thought embedded in Gabrielle Hecht's prepared comments for the first session, wherein she pointed to the quotidian things – the very ordinary social problems associated with bureaucratic function and authority, interested actors, and the political asymmetry between urban and rural regions – that seemed to give shape to nuclear disasters. More germane to engineering studies was her observation that these quotidian things tended to become buried as a result of nuclear exceptionalism. But while engineering may not have been as present in the 4S sessions as during the SHOT workshop, neither was it absent. In particular, engineering was a significant component of a number of the presenters from Japan. Partly because of issues of access resulting from their proximity to the disaster, but also because of the different professional configuration (formation) of engineering in Japan, engineers did appear more routinely in the papers presented by the Japanese authors. This included Yuko Fujigaki's presentation on the experts' responsibility in 3.11; Kohta Juraku on the failures of the 'successful' nuclear program in Japan; and Kuroda's account of the mobilization of the organization, Concerned Scientists and Engineers of Japan, following 3.11.

As regular sessions at an annual meeting with no pre-circulated papers, the conversations at 4S did not build in quite the same way as they had during the SHOT workshop two weeks earlier. Nevertheless, we had taken the time to organize a reception on the night prior to the first session, and the sessions themselves were set up to allow at least 30 minutes of discussion at the end of each session so that those attending all four sessions could feel like they were participating in an ongoing dialog. It is interesting that in our own engineering studies literature, this kind of relationship work is coded feminine and hence a form of uncompensated labor.<sup>24</sup> Those who attended these sessions felt that these were some of the most productive sessions they attended that year at 4S, and expressed their gratitude for the work we were doing to build an international research community.

### Convening the forum

In a way, the final, major event of the Forum was the NSF-sponsored workshop that we dubbed the 'inaugural' meeting of the Forum. I personally found the event to be a bit anticlimactic. There were certainly many who found this gathering to also be highly productive, and nearly everyone commented on the great care with which I and the staff of the Center for Science, Technology, Medicine and Society, and especially Diana Wear worked to create a positive space for conversation. Nevertheless, I continue to don a critical lens so that those who pursue similar initiatives can benefit from our experience.

First, on the mechanics of the event: Like the SHOT workshop in Copenhagen, we conducted the Berkeley workshop as a pre-circulated papers workshop with no author presentations. Papers were posted online with a required pre-workshop comment period, which was extended not only to all members of the online forum, but those who were unable to attend because of capacity. There were again four sessions, this time on disaster investigations, victims, and blame; institutional perspectives; radiation, information,

<sup>23</sup><http://fukushimaforum.wordpress.com/conferences/post-conference-synopsis-of-4s-sessions/>.

<sup>24</sup>Tonso, *On the Outskirts of Engineering*, 2008.

and control; and 'when disasters end', themes specifically chosen to cut across more conventional categorizations. There were other embellishments that we could afford to make because of the extended duration of the workshop – a full 2-1/2 days. This included several plenaries, an early session built around slide shows designed to evoke a sense of place, and an evening keynote by Dr Tatsujiro Suzuki, the vice chair of the Japan Atomic Energy Commission. In addition, we drew upon the reflective writing practices from Peter Taylor's New England Workshop on Science and Social Change, so that everyone had an opportunity to open the day by reflecting on the conversations from the previous day, and posting these thoughts before the discussions began. Opportunities for reflection also followed the workshop, with all writing being captured online.<sup>25</sup> Perusal of this material will reveal that the focus on engineering at the Berkeley workshop was more like at 4S than the SHOT workshop. This was by design. It reflected the orientation of our NSF proposal, which had been faithfully carried through to its execution.

As opposed to reviewing this engineering content, what I can probably do most profitably is to offer my own diagnosis of what did and did not work about this meeting. Many in fact found the intensive writing and reading of each other's thought pieces to be highly productive, both for becoming more familiar with the subtleties of another scholar's work, but also their disciplinary perspective. It also provided an opportunity to learn about how others read and understand one's own work, and this and the general opportunity to write provided an occasion for deep reflection. However, some also noted that the intense online discussion both before and during the workshop detracted from the in-person character of the meeting. Thus, although a number of promising ideas were embedded in the online comments, some clearly felt that they had already put their best ideas forward through this medium, and hesitated from repeating it during the meeting. As the facilitator, I should have recognized this response, and encouraged everyone to speak up regardless, given that many good ideas gain further strength through collective rearticulation.

Perhaps the greater intensity of the reflective writing did get in the way of free-flowing conversation. However, since we had employed something similar for the SHOT workshop, I suspect there were also other factors at work. One probable factor was the more diverse composition of the Berkeley workshop. Given that we had recruited for the SHOT workshop mainly through INES, SHOT, Teach 3.11, and the Tensions of Europe network, most arrived already familiar with STS or the history of technology. This group settled more immediately into the cadences of a familiar conversation, which was conducive to discussing new ideas intensively.

By contrast, the broader publicity that we gave to the NSF workshop meant that there were, through my insistence, a number of people from the broader disaster studies community; several graduate students from media studies and related fields; and three engineers. Two were civil engineers from Japan who were very much engaged with the social sciences and were involved with relief operations there. Another, a member of UC Berkeley's nuclear engineering faculty, we had specifically invited to the event. I know that at least one of the participants was deeply troubled by the fact that our conversations at Berkeley could not reach this one engineer, who was someone who had made a serious overture to the social sciences. I can only imagine that the STS dominated dialog appeared too critical, offering no obvious entry point for anyone from the nuclear engineering community. As for the rest of the participants who came from disciplines beyond STS, they all arrived with an earnest desire to learn what disaster STS was about; they accepted our claim that

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<sup>25</sup><http://fukushimaforum.wordpress.com/workshops/sts-forum-on-the-2011-fukushima-east-japan-disaster/>.

the technoscientific dimensions of a complex disaster were things that we needed to better understand. Yet when compared to the SHOT workshop, too many participants lacked sufficient familiarity with STS to know how to keep the conversation rolling.

Perhaps the interdisciplinary composition of the participants might have still been useful for disaster STS had the goals of the workshop been perfectly clear: giving articulation to disaster STS. But this is where, at least in my judgment, there was a second set of tensions that we had unfortunately built into our NSF proposal, namely our stance towards the Japanese scholars, and the emphasis on disaster STS. We failed to anticipate that there were differing viewpoints surrounding research ethics, and failed to recognize the proposal's bias towards intellectual merit.

In the defense of the latter, and I would include myself in the mix, those of us who wanted to see the development of disaster STS saw real limits to all of the 'single event' scholarship on disasters. As scholars from various disciplines enter into the academic study of the latest disaster because of their physical or personal proximity to the event, they wind up replicating many of the findings produced during previous disasters. For my colleagues who had studied disasters for decades, it was a natural impulse to want to elevate their knowledge to a new level of generality that could somehow transcend a specific disaster. As one person would note in response to some of the frustrations expressed about the workshop, what would be the ethics of a collective decision by disaster STS scholars not to study the latest disaster because of their distance from the event?

However, from the point of view of some – not all – of the Japanese scholars attending the workshop, it also seemed incredulous that some scholars would pursue the academic study of a disaster separate from their desire to understand and empathize with the victims of the specific disaster. A common refrain was, why did so many of the scholars who were committed to disaster STS not ask more about the unfolding situation in Japan? Why was there no interest in learning more about what was occurring on the ground from the people who had spent the most time in the affected areas? This was in fact a position not at all different from the one we ourselves wrote into the NSF proposal, where it was proposed that the East Japan Disaster would provide the empirical foundations from which to give articulation to the field of disaster STS.

I would suggest that there is a need for greater trust on both ends. Those new to disaster studies should strive to understand how those who have dedicated their careers to the study of disasters are pursuing work in a way that they believe will most benefit the victims of present and future disasters.<sup>26</sup> Likewise, those pursuing disaster studies from abroad should strive to understand the different ethical standards and protocols for scholarship that may exist within different countries. Where such cross-cultural and cross-disciplinary awareness is not yet present, it is important for the organizers to do the kind of relationship work needed to open up a space for generative conversation.

Indeed, from the standpoint of the lessons learned for future workshop organizers, there is a clear need to build in processes designed to cultivate trust during the early part of any workshop. This was somewhat disappointing to learn, given that we had spent over

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<sup>26</sup>Here I would especially draw attention to Fortun's work, which since the beginning has challenged the boundary between scholarship and activism, and between understanding and doing. First examined in the context of both understanding and practicing advocacy for the victims of the Bhopal disaster, her current work with her students, for instance, on asthma also reflects a similar dual orientation. Kim's formulation of disaster STS should be understood on this basis, as is also reflected through her commitment to work with the IAEA on curricular issues for Fukushima University's medical students. See Fortun, *Advocacy after Bhopal*, 2001, and also "The Asthma Files," <http://theasthmafiles.org/> (Accessed September 10, 2014).

a year building such trust. However, given that the workshop included new participants, it was necessary to do such work again to bring everyone into the fold. In postmortem conversations held after the workshop, it became very clear that we should have started the workshop with an open conversation about the goals of the workshop, where everyone was given an opportunity to affirm – or challenge – the stated aims of the workshop.

## Conclusions

I want to be very clear that I do not regard our efforts to be a failure. Many people put a lot of time into building up the Forum, and we and others all benefited from our collective efforts. Each of our meetings, including the one in Berkeley, generated robust conversations that many found very valuable. Some felt that the care with which we convened the in-person workshops was extraordinary, and that the virtual conferences that we built through the WordPress platform was not only novel, but extremely rich when compared to other venues for works in progress. Most importantly, our work placed many scholars who were working on the East Japan Disaster in touch with one another, helping to build international bridges as well as bringing many previously isolated scholars into a larger fold. While our online forum at present is less active, these collegial networks have persisted. While it is likely that this would have occurred through normal academic channels, I believe our efforts accelerated the process.

I still remain incapable of rendering a scholarly judgment on the effects that our interventions had on the field of disaster studies and disaster STS. This being said, the papers and ideas shared at the events we organized have been or are in the process of being published. Perhaps the most significant of these is an edited compilation being assembled by Scott Knowles, Ryuma Shineha, and myself (again, in a supporting role) that will appear with the University of Pennsylvania Press. Moreover, Scott has been able to build on our initiative, as well as his prior work in disaster studies, to convince the University of Pennsylvania to launch a new book series on disasters, as co-edited by himself and Kim Fortun. Many other papers from the events we organized have found their way into print.

From the standpoint of scalable scholarship, there have been notable effects as well. Perhaps most visible has been a special issue of *The Asia-Pacific Journal: Japan Focus*, a popular journal with a wider audience. The special issue was assembled by David McNeill and Paul Jobin based on papers presented at the Berkeley workshop.<sup>27</sup> Also, through the invitation of Rethy Chhem, who had attended the Berkeley workshop in his capacity as the Director of the Health Sciences Division of the International Atomic Energy Agency, Kim Fortun and other scholars have visited Japan and have been working with the faculty at Fukushima University to develop an STS influenced curriculum for medical students learning about radiation effects. As intended, Kim has also continued to build the Disaster STS Network by drawing on some of the momentum generated by our work on the East Japan Disaster. A draft report written by Aya Okada, Luis Felipe Murillo, and myself served as a white paper for those attending a meeting convened in Washington, DC in fall of 2013 to launch the Disaster STS Network (see <http://disaster-sts-network.org/>). While the productive tension between scholarship and engagement remains within that network, it is notable that Kim was one of the panelists Gary chose to enroll for Buenos Aires in describing the different ways that scholars were ‘making and doing’ STS.

The ‘criticism’ in this critical participation piece has been directed at the underlying tensions that are integral to the work of producing scalable scholarship: The tension between

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<sup>27</sup>McNeill and Jobin, “Japan’s 3.11,” 2014.

personal and professional life; between scholarship and engagement; and the academic tensions within any interdisciplinary arena, which in this case also fell along international lines. I have often asked myself whether it made sense for someone not involved with disaster research to lead this kind of initiative. The answer that I keep returning to is that I saw a need, as well as something approaching an injustice that no one was stepping forward to correct. And while in hindsight, I have ideas about how I might have done things differently, I believe the underlying lesson is that these kinds of tensions will always surface during any effort to make and do STS. If I were asked to offer advice based on this lesson, they would be very basic: It would be about learning to be intentional in our actions, paying attention to process, and most importantly, taking the time to step back and reflect, especially in light of our over busy academic schedules and the heady excitement of making and doing things.

With regard to engineering studies, the lessons are perhaps less generalizable. All I can say is that in the case of a topic such as nuclear disasters, where there is a clear dominant framing rooted in the broader STS literature, the tensions invoked can be overwhelming. In the end, the work of the Forum that we created brought some attention to the engineering issues associated with the East Japan Disaster, but probably failed to bring engineering into the emerging field of disaster STS in a sufficiently integrated and balanced manner. As Kendra and Nigg point out in their contribution to this special issue, this particular form of interdisciplinary collaboration is not easy. Especially in considering as well the other articles in this issue, there clearly remains more work to do in terms of understanding the engineering dimensions of the East Japan Disaster, and perhaps of disaster STS itself.

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