TSUNAMI



JAPAN'S POST-FUKUSHIMA FUTURE

ESSAYS ON THE MANY AFTERSHOCKS OF JAPAN'S NUCLEAR NIGHTMARE.

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EDITED BY JEFF KINGSTON



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Edited by Jeff Kingston

With proceeds going to the Japan Society for tsunami relief

"For the 20 years before this great earthquake disaster, our nation has seemed, in many ways, to be at an impasse. As we overcome the crisis created by this disaster, we must also overcome the preceding crisis, what could be called Japan's structural crisis."

— Naoto Kan

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INTRODUCTION

By Jeff Kingston

On March 11, 2011, at 2:46 p.m., a gargantuan, magnitude-9 earthquake rattled Japan's main island of Honshu, the strongest temblor to hit the nation in recorded history. The resulting tsunami, as high as 38 meters in places (imagine a 12-story building bearing down), pulverized the northeastern coast of Honshu. Entire towns and villages were transformed into twisted mounds of waterlogged rubble and communities were obliterated. Walking around some of these stricken areas brought to mind photos of Hiroshima 1945; here and there a battered concrete structure poked out of a suddenly flattened, devastated landscape. In Fukushima, the tsunami reached some 15 meters, inundating the now infamous Fukushima Daiichi nuclear power complex. The ensuing nuclear crisis eventually forced the evacuation of 80,000 residents within a 20-kilometer radius, subsequently expanded to include other hot zones beyond the arc, and raised important questions about Japan's plans to expand nuclear power to some 50 percent of its electricity-generating capacity by 2030.

As I write this in early June, more than 100,000 people remain in evacuation centers living in grim and crowded conditions with little hope and no privacy. So many evacuees are traumatized by the loss of family and everything they have accumulated over their lives that it remains to be seen whether they have the emotional, economic and physical resources to overcome this tragedy and to what extent the government and civil society groups can help them do so. The citizens of these pulverized towns face uncertain prospects and a road to recovery that could last a decade or

more. This is also the path that Japan finds itself on. Confronted with tough questions about its dependence on nuclear power, about the competence of its leaders both in the private and public sectors, about the economy's ability to rebound from a shock, the country has been plunged into crisis. After centuries of earthquakes, tsunamis, war, and a long list of other disasters, natural and unnatural, the Japanese people are accustomed to building back stronger — but how do they recover from such a devastating blow, and what will that new future look like?

This unique ebook, the first to respond to the quake in such depth, assembles some of the top writers and scholars working in Japan today to answer these questions: How will Japan rebuild, and what lessons must it learn from its past? Our contributors range from such prominent journalists as *Financial Times* Asia-Pacific editor David Pilling, who writes that "This sense that Japan has, many times before, confronted and overcome crisis is a powerful national talisman" to former *Economist* editor Bill Emmott to best-selling author Robert Whiting, known for his books on the yakuza and Japanese baseball. Prize-winning poet Mariko Nagai has written a powerful short story on the historical recurrence of tsunamis in Japan that addresses the emotional impact as well as the geological. Steven Corbett's first-person account of fleeing the waves gives a visceral connection to the events. And in a complex and smart section on energy, authors Gavin McCormack, Robert Dujarric, Andrew DeWit and Masaru Kaneko, among others, debate Japan's nuclear future, and whether it has one.

Proceeds from this book will be donated to the Japan Society of New York, which will distribute the money to various charities in Japan it has been working with since 3/11. Our goal in compiling this collection is to offer a real-time look at an immensely significant world event and to spark a global conversation about a shock whose reverberations will be felt for years. The essays reveal above all the hazards of forgetting history — and in the case of Japan and natural disaster, it is certainly doomed to be repeated.

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Three months after the quake, it's already clear what some of the immediate ramifications will be. The economic consequences will be massive

and extended, with estimated overall costs of recovery ranging from Y25 trillion ($309 billion), about 3 percent of gross domestic product, to an eye-popping $500 billion, dwarfing the 1995 Great Hanshin Earthquake (Kobe) figure of about Y10 trillion. The government passed a Y4-trillion emergency relief budget and another is in the works. Tokyo Electric Power Co. (TEPCO) faces claims amounting to an estimated Y11 trillion, prompting the Japanese government to provide backing in order to avoid bankruptcy. For fiscal 2010-2011 (April through March), TEPCO posted a loss of Y1.25 trillion ($15.3 billion), the biggest loss by a nonfinancial firm in Japan's history. The Finance Ministry estimates that quake claims covered by insurance companies will be 12 times the Y78 billion paid out following the Kobe earthquake. Although Japan already has the highest public debt-to-GDP ratio in the world (200+ percent), market analysts are confident that Japan can fund the recovery, although ratings agencies have warned of downgrading and criticize inaction on raising revenues to fund the recovery packages. Nobody was that surprised that GDP contracted by an annualized 3.5 percent in the first quarter of 2011. Forecasts vary, however, about how fast the economy will rebound in the second half of 2011 with optimists projecting 1 percent growth for the year and close to 3 percent for 2012. Government emergency recovery spending is expected to boost GDP, but fears of electricity shortages and continued supply bottlenecks raise concerns about cuts in production and exports that might constrain growth significantly.

So will the government turn the disaster into an opportunity? Prime Minister Naoto Kan's DPJ (Democratic Party of Japan) has been embattled since the disaster. But his handling of the immediate aftermath was relatively adept, widespread criticism notwithstanding. On the eve of the tsunami, Kan was on the ropes and headed for the exits as scandals battered his administration and he plunged in public opinion polls. As soon as the quake hit, however, and in contrast to the Kobe earthquake when the government was paralyzed, Kan immediately mobilized 100,000 troops and accepted international offers of assistance. Tsunami disaster relief has been reasonably fast and effective under difficult circumstances. Opposition politicians criticized the government for not meeting its target of building 30,000 temporary houses for evacuees by June, but it managed to build 27,200 units in 10 weeks, an impressive performance given shortages of building materials,

difficulty in finding suitable sites and damage to infrastructure and transport networks. For comparison, in Tamil Nadu, India, nearly seven years after the devastating 2004 tsunami, the government has managed to build only a total of 7,800 units. Kan has promised to have temporary housing ready for all evacuees by mid-August, an ambitious target.

Kan spoke for the nation in dressing down TEPCO and also called on the U.S. Nuclear Regulatory Commission and U.S. military assets in Japan to get better information on the expanding crisis. He also has launched an independent investigation of the Fukushima accident, pressured Chubu Electric to shut down its vulnerable Hamaoka nuclear plant, hit the reset button on the national energy strategy, and advocates changes in how the industry is regulated, ending the utilities monopoly over distributing electricity and rapidly expanding renewable energy. Assertive as these plans are, Kan has been derided in the media for failing to lead while popular frustration with the evolving and prolonged nuclear crisis has translated into falling support in public opinion polls and led to a no-confidence motion in early June that he survived only by promising to step down.

But overall, despite a reluctance to delegate, Kan probably deserves more credit than most observers seem willing to acknowledge. Under the dire circumstances of a complex catastrophe involving the triple whammy of an unprecedented earthquake, tsunami, and nuclear crisis, Kan managed the initial relief operations reasonably well. A lot depends on the yardstick against which he is measured. Compared to America's Hurricane Katrina, the 2004 tsunami in Aceh and Sri Lanka, and the earthquakes in Kobe 1995 and Sichuan in 2008, the current response has been relatively good. The example of the BP oil spill also shows that Japan is not unique in lacking crisis-management skills. Anyone who witnessed the bungling response to the Kobe disaster cannot help but be impressed by how much better the current government's disaster response has been in every respect. This is scant consolation to evacuees, but not meeting people's expectations and assuaging their frustrations does not in itself mean Kan is doing a lousy job. Much of the public dissatisfaction stems from the Fukushima accident, and responsibility for this is mostly TEPCO's and government agencies failing to do their jobs.

When it comes to Japan's energy future, the consequences of the crisis

are only just beginning to make themselves clear. The Fukushima disaster highlighted TEPCO's spotty record of repair and maintenance, the dangers affecting older nuclear power plants, inadequate preparations for tsunami risk, and, most damning, ties between government and industry leavened with conflicting and sometimes inaccurate disclosure of pertinent information. Support for expanding nuclear power dropped to about 10 percent in public opinion polls.

Media reports have drawn attention to the cozy and collusive relations between government and the nuclear industry, an incestuous network of ties known to everyone in Japan now as the "nuclear village." The practice of *amakudari* (descent from heaven) involves bureaucrats taking up positions in companies that they formerly regulated, while industry officials are regularly represented on influential government advisory panels that shape policy in their area. As with the revolving door in the United States, there is considerable connivance between business and government in Japan. The media suggests that this pattern of interaction and the fixed mind-set within the nuclear village has controlled Japan's energy policy and ignored contrarian views. Courts also have helped by usually rejecting claims about unsafe siting or design flaws. Any victories in the lower courts are overturned on appeal, most embarrassingly involving the Kashiwazaki plant that was shut down by a 6.8 earthquake in 2007 — not long after an appeals court sided with TEPCO in dismissing a suit claiming that the site was unsafe because it placed the world's largest nuclear power complex on top of a fault line.

The nuclear industry is heavily regulated, but critics assert that regulators exercise their supervisory duties in a perfunctory, "go along, get along" manner. In 2001, for example, TEPCO estimated that the maximum tsunami at the Fukushima plant would be 5.7 meters, but did not submit any documentation supporting this estimate. The Nuclear and Industrial Safety Agency (NISA) never questioned this estimate or asked for any documentation backing it up. In the event, the 3/11 tsunami was more than twice as high as this calculation. It is also troubling that nuclear safety measures tend to be more reactive than proactive, and rely on optimistic assumptions that downplay risks. In addition, seismic science has made advances in determining faults and assessing earthquake and tsunami potential that utilities have largely ignored because the conclusions undermine prevailing

assumptions and could prove costly.

The fallout from Fukushima casts a cloud over the global nuclear power industry. Already Germany has reversed its decision to extend the operating life of its aging nuclear power plants and has put forward a timetable to close down all 17 of its reactors by 2022. Chancellor Angela Merkel's unpopular plan to extend the operating license of Germany's aging plants became difficult after it was revealed that the crippled Fukushima plant is one of Japan's oldest; its operating license was extended for 10 years only two weeks before the tsunami, despite the government report approving the extension noting repair and maintenance lapses and stress cracks in the backup diesel generators that failed in the event. At the 2011 G-8 summit, Japan, the U.K., U.S., France and Russia reiterated their commitment to nuclear power while calling for stricter safety regulation and review of International Atomic Energy Agency standards and powers. Russia called for mandatory international safety standards and restrictions on building nuclear power plants in earthquake-prone areas.

The impact of Fukushima is not expected to significantly slow China's ambitious nuclear energy plans, with 13 reactors currently online and 27 more under construction. Currently nuclear energy generates about 1 percent of electricity in China and is expected to provide 6 percent by 2020. India is also proceeding with rapid nuclear energy expansion. Currently it operates 20 reactors at six plants and plans to expand nuclear generating capacity from a current 4,780 megawatts to 64,000 megawatts by 2032, accounting for some 9 percent of total electricity generating capacity, up from 4.2 percent in 2010.

Meanwhile, back on the north coast itself, the rebuilding has already been contentious. Some survivors remain keen to rebuild their communities as they were, protected with higher sea walls, partly because of their attachment to their ancestral homes and once-thriving communities, but also because land is the single most important asset of most households. There is also an inclination among some survivors to not give in. In addition, many depend on the sea for their livelihoods and living nearby is convenient. The government has not yet decided on a rebuilding design, but there are indications that planners favor integrating sparsely populated towns into compact towns in safer locations where it would be possible to

provide improved social services for elderly residents. The Reconstruction Design Council is also recommending a consolidation of more than 200 damaged ports into a few large, integrated facilities aimed at restoring the region's key fishing and seafood processing industries, and advocates making the region a renewable-energy hub.

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This ebook owes a great deal to the generosity and expertise of the authors and reflects their collective commitment to raising money and public awareness in order to alleviate the disaster, promote recovery and draw lessons. We see our ebook as building on *Quakebook* (officially *2:46: Aftershocks: Stories from the Japan Earthquake*), a Twitter-sourced book that came out in the immediate aftermath featuring brief impressionistic essays and which is also raising money for charity. *Tsunami* is fundamentally different, providing a more in-depth, analytical look at this complex catastrophe that probes the consequences and implications for the Japanese and the international community. I would like to thank the authors for contributing to this project and express my deep appreciation to Susan Glasser and Britt Peterson for agreeing to take this on for *Foreign Policy*, ensuring that it reaches the right audience.

We hope you will spread word about the book and will be generous in donating to charities involved in the recovery.

Jeff Kingston is director of Asian Studies at Temple University, Japan campus.

CHAPTER 1
What We Saw: Tales From the Hot Zone



IWATE PREFECTURE ON MARCH 19 (PHOTO BY NICHOLAS KAMM/AFP/GETTY IMAGES)

"No matter how many years may pass, do not forget this warning."
—Stone tablet from 1933 marking tsunami's reach

"I cannot trust the government, but no matter how high the radiation may be and whatever compensation I might receive, I don't want to leave here."
—30-year-old mother living in Fukushima

March 11, 2011: Stones in Spring
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MARCH 11, 2011: STONES IN SPRING

BY MARIKO NAGAI

July 13, 869

The land of Mutsuno-kuni trembled and greatly shook. Thunderstorms covered the night sky, lighting it up as if it was daylight. Immediately afterwards, the people cried and screamed, unable to get up from the ground. In some instances, the houses fell on them and they died under the weight, and in other instances, the earth sheared open and some died buried alive under the earth and sand. The cattle ran in surprise, stampeding each other. Numerous walls, gates, storage sheds, and the moat fell and were turned upside down. The mouth of the sea howled, sounding like thunder. And the violent waves and high tides arrived, going upstream into the rivers, continuing until, in the blink of an eye, they reached the wall of the Taga Castle. The scene of the flood that had extended several dozen li was so vast you could not tell where the sea ended and the land started. Plains and roads all turned into the ocean. There was no time to get onto boats or to climb the mountains; a thousand people drowned. Nothing — property and fields — remained; everything was utterly destroyed.

—Nihon Sandai Jitsuroku (901)

A boy has been walking like this for several days now, going from one evacuation shelter to another, still shy around strangers, but he knows that if he does not do this, no one will. *The missing person's report can be filed if someone is still alive and looking for them; if the entire family has died, then there is no one left to file the missing report.* He does not know who told this to him — maybe a helpful adult trying to cheer him up, maybe the man who

took him in — but the boy knows that he is the only person alive in his family. It was only a week ago: He remembers his parents in the front seat; he remembers his cousins and his grandmother in the backseat; he remembers the car speeding along the familiar road, away from the elementary school, as quickly as it could, away from the oncoming waves; he remembers his mother screaming, *The waves, turn to the left, left*, he remembers breaking the window open when the car was suddenly engulfed, underwater, tossed around, with so many familiar objects turning deadly: corpses, vending machines, telephone wires, shelves. He remembers holding his cousin's hands as they broke away from the car, and waves tossing them in, out, as his grandmother screamed for help, and the hands letting go. He remembers losing consciousness, then he woke up, and found himself adrift on a board. That is all he remembers. He does not remember what happened to his family. Nor what happened to the car that was supposed to be carrying them to safety, but didn't. Now, he walks from one shelter to another, walking between homeless people, too shy to call out the names of his family on the sign he holds up, too scared to ask around whether anyone knows anything about his family. Who will look for them if he doesn't? He is the only one left, and even though he is only eight years old, he knows that he is the only person who can look for them, because there is no one else.

May 14, 1585

On this stone by Tokura Village lies a testament to the violent sea waves.

—A stone tablet by Tokura Village, Miyagi prefecture (1585)

The dead die twice in Japan: once, when the soul disengages itself from the body, and again, when the body, the husk left behind by the soul, is cremated or buried. During the Heian period, the sick and dying were driven out of their houses because they were believed to pollute the entire family; corpses were left by family members along riverbanks for nature to do its job. The body was seen as only a carrier of the soul, a vehicle that carries men through their fated lives. Today, however, the body is considered as something more than it had been for many years; the body is the representation, it is the tangible, and the proof. The dead cannot just leave anymore,

hiding the body as a dying cat would, seeking out its last place. For the living, it is not enough for the soul to depart, for someone to have *died*. The living must redefine the body, from the *thing* they called in the morning, *Wake up, you're going to be late*, the thing they used to make fun of, *Look at you, you look like a bear,* the thing they stroked lovingly, the thing that carried names, *Toshio, Kane, Hiromi,* into something that must be let go. The body needs to be there so that the living can outfit them in the final pilgrimage with clothes and canes, so that the living can place the dead one's favorite items – letters, photos, stuffed animals – to take with them to the otherworld; so the living can stroke the cold cheeks and whisper the last words, and to finally let go by closing the lid of the coffin and see the body reduced to its fundamental form: ashes. But what if there is no body to grieve over? The bodies have been carried offshore, miles and miles away from their homes. The living, instead, wonder if perhaps they have not died, that they have survived the catastrophe, and are waiting for them at a shelter, looking and waiting for the living to claim them as their own.

December 2, 1611

Our territory shook greatly, and the sea flooded, drowning and killing 1,783 men and women and 85 horses and cows. Immediately, we command the fishermen to the sea; they say that the color of the sea is not normal, and has not returned to its usual color; with their permission, we have six or seven fishermen take us out on their boat. The waves have reached so many miles inland … in the field of sea, there is no house left standing, so many have drowned, and many boats are tangled in high trees ….

—Sunpuhan Seijiroku Sansho (1611)

Men and women scan through the list of descriptions of the dead: a mole on his shoulder. A surgical scar on her abdomen. Four wisdom teeth pulled out; fillings in molars; a missing pancreas. The familiar bodies, with their small marks that one took for granted, have become the defining feature of the dead, and it is that feature the mourners are looking for, to see for themselves that their missing is as singular in death as they were when alive. Men and women crane their necks, left, right, some following the descriptions

with their tired fingers. One person recognizes the body's signature; the staff in charge takes her aside and shows her a photo, the body so unrecognizably decomposed that the identifier falters. She is not sure. On the other side of the curtain, the medical examiners work in a group of two, three, excavating the body's intimate details, to identify the bodies in front of them so that someone can name them. It is their job, they know; it is their job to pry open the body, to find marks, because the dead cannot speak, because without the details of how these people died, the mourners will not be able to let go. The exact time and day of death for all the dead: March 11, 2011, 3 p.m.

March 12, 1677

Several dozen earthquakes hit the southern part of the territory. Though there were no direct casualties from the earthquake, a tsunami came and engulfed villages. Many houses were washed away.

—A stone tablet (1677)

The land, after a tsunami, is a broken land, so full of sea salt that nothing will yield from this earth for many years, not even the most resilient of crops. The ocean, which gives bounty to the coastal villagers, can turn into an unwieldy beast, rummaging through the land with its claws and fangs, taking everything in its path as it ravages through its journey. And it leaves behind not just the ruin, but a polluted land rendered useless. The harvest will not come this year or the next, but the villagers will do everything to purify the land, and they will keep going, as their fathers have done and their grandmothers.

1689

Tsunami in Rikuchunokuni

—A stone tablet

The warning did come in time, but some did not remember. The warning blared after the earthquake, the tsunami warning that came out of nearly every village and town hall, *There is a tsunami warning, please evacuate to high ground, This is a tsunami warning, please evacuate to high ground.* They were

too used to it, too used to the warnings that came nearly every year, the warning that did not amount to anything more than a mere splash. Those who did not heed the warning went back to retrieve their memories, their past, what they deemed important: photos, documents, the tablets of the dead, cash cards. *Go to the mountain when there's an earthquake, no matter how small*, the old people used to tell them, the ones who remembered the tsunami from Showa 8, the ones who remembered what the one who remembered the Meiji tsunami said. They did not remember that this coastline has been plagued with the angry waves as long as written words have existed, each devastation chiseled into stones. It is grief impressed upon the pages and stone tablets that dot the coast of Sanriku area, though the names have changed with time, with the borders shifting along with the new warlords and governments. It is regrets contained in these words, regrets that translate into warnings for the future, for the present. But some had forgotten. So instead, they went home, thinking they have enough time.

February 17, 1793

An earthquake and tsunami on the Sanriku coast …

—A stone tablet

An old man gets up early at the evacuation shelter, making sure not to wake the people sleeping next to him. He carries with him only a bottle of water and a rice ball. He walks through the now-familiar road, cleared, yet both sides flattened, filled with the ruins of houses and cars and boats, as if someone had painted a new reality: a car perched atop the trees, rooftops right by the earth, everything familiar has been ripped from his memory, and instead, this new landscape that brings with it the unfamiliar death. It has been a month. A long month, but he is still not used to it. His daughter is missing, and to him, she is not dead, only missing. He stubbornly refuses to go to the medical examiner's offices strewn in the neighborhood. If he goes to the offices, if he finds himself looking for her identification marks, then that is admitting to himself that she is dead, and that he will be betraying her; if and when she comes to the shelter to look for him.

August 23, 1836

A big earthquake in the Sendai area; the walls of the castle fell and the area was flooded with seawater. Several hundred houses were washed away, with countless numbers of men and women drowned to death …

—The History of Higashihan

A sign atop the rubble: *XX family used to live here where you stand. Please do not walk atop this rubble. There are bodies underneath.* The police and the soldiers line up and bow when a body is found. Even though the dying came all too quickly, unprepared, taking the lives so quickly, the body is given the dignity it deserves.

June 15, 1896

On June 15, a little past 8 p.m., strange sounds similar to cannon fire came from the sea and soon turned into the roaring sound of a locomotive engine approaching the town of Shizukawa-cho in Miyagi prefecture. While people stood around wondering what the sound was, the angry wave 3 meters high came roaring into the town. The speed and power was so strong that before people had the chance to be surprised, the playhouse was washed away, 90 or so fishermen's huts were dragged to the bottom of the sea. The sounds of houses being torn down, the angry sounds of the water erased the sounds of men and women, the young and the old, screaming and yelling, these horrific sounds deafening the ear. Perhaps 24 or 25 minutes later, the waves receded, but the devastation left by the tsunami was so awful we had to avert our eyes. Dead bodies were strewn here and there, covered in mud and debris, and the severely wounded groaned and called for help amidst the mud. The house of Mr. Suwanari, the secretary of the neighborhood committee, was found in a field so far away from its original spot, and his wife was found dead with their child in her arms, while he himself was on the second floor of the house with his two children. He said that he finally feels like he is alive. There are so many more instances of devastation, but they are so tragic that the words fail to capture everything.

—Jijishinpou (June 19, 1896)

Nearly 2,500 bodies remain unclaimed after five weeks. No one is looking for them. No one is alive to claim them as their own, to name them, and to give them a proper burial fit for a life lived.

March 3, 1933

Houses built on hills will bring peace to the children and grandchildren
With the thought of devastation of the great tsunami,
Remember never to build houses below this marker
Both in Meiji 29 and Showa 8, the waves came to this very point
And the entire village was destroyed; only two survived in Meiji 29, and four in Showa 8
No matter how many years may pass, do not forget this warning.

—A stone tablet

And they did. As soon as the earthquake settled, but just as quickly, the tsunami warning blared in the afternoon, as the villager-fishermen were done with their day's fishing. They instinctively gathered themselves, took the hands of their children, hoisted their elders on their backs, and ran up the narrow road, abandoning their homes and memories tucked in every crook of this palm-sized hamlet just by the sea. They ran nearly a kilometer as the ocean raged behind them, washing away their houses and carrying their boats, chasing them, but they did not look back, not to their past, not to their material goods. They only had one thing on their minds: go to the house beyond the stone tablet carrying the message, No matter how many years may pass, do not forget this warning. And finally, when they were all there, they looked back to find their houses gone, the water rushing toward them, rushing, rushing. And, as if it lost interest, the water stopped, only a foot away from the tablet, and began to recede back to the sea, as if nothing had happened. They lost their houses, their lives' worth made tangible through photos and the tablets of their ancestors; the village drowned under seawater. They lost everything that defined them, but they kept one thing: their lives, each and every life in this hamlet.

Mariko Nagai is a poet in Tokyo. She teaches at Temple University, Japan campus.

MARRY ME

BY KAORI SHOJI

People are getting married.

For over a decade, Japan's marriage and birth rates have been scraping bottom. Especially in urban areas, it felt like men and women just didn't want much to do with each other. Now, among the post-disaster news that businesses are failing, companies are going bust and there's not enough electrical power to tide Tokyo over a long, hot summer, couples are coming together to commit to a lifetime of togetherness, whether they have the means to throw a wedding or afford a quake-resistant house. Wedding and engagement rings represent a sizable market, at a time when people are otherwise avoiding the luxury-items counter to conscientiously stock up on rice and toilet paper.

My friend Ikuko is marrying her ex-boyfriend from college — a guy she had split up with 15 years ago because she couldn't stand the way he neglected his nose hairs. True story. But on that March evening when for many of us in eastern Japan, life as we knew it bent and skewed out of shape, Ikuko got a text message from her ex at 2 in the morning asking how she was and whether she needed help. It was a definitive moment in her life and in the lives of many Japanese who in the wake of the disaster connected unexpectedly, even miraculously — with loved ones far and near, from the past and in the present. The next day, he came over to her apartment with a bottle of sake and a bag of rice. The next week, he proposed and she said yes.

Another friend — a man who lived with his wife on the 30th floor of a luxury condo building in Ibaraki prefecture where all utilities shut down for a week — climbed 30 flights of stairs in pitch darkness after having walked

from his office 10 miles away. He's your typical salaryman in his 40s — tired and out of shape — and as he tackled those stairs step by agonizing step, he couldn't tell anymore whether it was his pounding heart that was causing his whole body to sway like a boat in a storm or whether the building was still being attacked by the residual quakes that reverberated throughout most of the eastern plateau. It was close to 1 a.m. when, panting and sweating, he pushed open the steel door to his apartment. His wife was sitting at the kitchen table in front of a single candle that she had managed to find. He took her in his arms, held and rocked her and stroked her hair. It was the first time in their 15-year marriage that he had done anything like that, and the spontaneity of his own act took him by surprise. They stayed like that, holding each other until daylight revealed that the kitchen was in shambles, almost all the dishes had been smashed to smithereens, books were strewn everywhere, light fixtures had detached and were hanging from the ceiling. He said later that the subsequent week felt like a honeymoon — he and his wife spent the entire time enwrapped in a haze of new-found love for each other. For the first time in a long time, there were tons to do (carrying water, cooking over a camp stove, cleaning up the mess) and talk about (what happened with the tsunami, what about the damage in the Fukushima nuclear power plant, were they all going to die?) and in the process, he fell in love again.

Collecting such stories ease my mind — I store them in a private little evac shelter inside my brain. This is where I run to when facing my parents — and these stories of tenderness envelop me like a blanket, protecting me from the sobs that catch my throat when I try to talk to them. My father is from Miyagi prefecture — the eldest son of six siblings and a member of a huge, sprawling family tree with branches extending to all the areas where the disaster hit the hardest. News footage shows miles of debris and rubble, sniffling women, children left without parents, smoke coming out of crematoriums 14 hours a day — even now, more than two months after the tsunami.

My father's cousins are missing.

One of his nephews is dead.

His mother's house, which contained the mementos and photos of my father's youth — years that his children have no knowledge of — burned

to the ground in the aftermath of the quake. His sisters lost their homes, their livelihoods, a son, and so many friends. I sneak a look at my father's face but as always there is only resignation and the indomitable will to wipe out emotion. What can he be thinking? Whatever else he may be feeling, I do know that the almost magical sense of love and connection that seems to be piped into the air these days is leaving him cold. Love had never been his strong point anyway. Duty and obligation had been his watchwords and in his scheme of things, he had paid all dues to Miyagi a long time ago. He's square with his parents, his siblings, his hometown, his past. He doesn't allow himself to feel much for the devastated region that had fostered his childhood and adolescence, saw him through his university years and nurtured his family for generations. In fact, there's not much he feels for anymore. He plays golf and exchanges platitudes with like-minded, retired salarymen that live in the same condominium, watches TV and goes to bed early. And unlike my friend who rediscovered the art of holding his wife, my father makes sure there's plenty of physical distance away from my mother, in their huge (by Japanese standards) apartment located 100 kilometers west of Tokyo. When I call them, he takes the call and transfers it to her line, in her room, at the opposite end of a long hallway.

Their condo building is a 27-story concrete monstrosity built in the mountains: completely quake-resistant, running solely on electricity and drawing hot spa water from a natural spring. My father, who had spent over four decades of his professional life scouring the globe on behalf of his company, has settled here with his wife who hates his family back in Miyagi with every fiber of her being, and subsequently has raged an internal war with the entire northeastern region throughout their marriage. The rupture is too deep to mend — my mother can never forgive my father for sending money to Miyagi during their lean years when the children were going to school and she couldn't afford to buy one new thing for herself. She bitterly resents the fact that as the eldest son, my father was expected to bear the burden of supporting his Miyagi family, and the way my grandparents lauded his efforts with words but not much in the way of action. "Your grandmother is from typical northeastern stock," she used to say to us. "She sits on her behind and expects her son to take care of her, forever." My mother is from southern Japan, and her personality bears the hallmarks of its people:

a short-fuse temper, gutsy ambition and fierce competitiveness. During the first weeks after the quake/tsunami the Japanese media commented on how, if this had to happen, it was better that it happened to people in the northeast, renowned for their stoic patience and incredibly high endurance levels. My mother more or less said the same thing but with a venom that turned the blood cold: "I won't say those people had it coming to them. But their stay-still-and-bear-it temperament is better suited to deal with this kind of shock. There they are, sitting on their behinds waiting for others to come and help. SO typical!"

My father responded with a terse observation that Japan is earthquake prone and this could happen to anyone and everyone living in the archipelago. Like a true Miyagi man, he took all that happened and swallowed it, and if he choked in the process, he wasn't going to let anyone know. His wife wasn't about to comfort him, and since his mother's death three years ago, most of the ties he had to the land of his birth withered and sank into its own soil. For 40 years my father had toiled at the same securities company, stayed with the same woman who declared she disliked him to the marrow, had said little and smiled even less and kept sending funds to his mother's bank account. During that time he visited his hometown on the very occasional weekend every five years or so, and upon his retirement from the company my father had racked up a total of 488 unused paid vacation days. This was what he said upon returning from New York — the last and final post of his professional life: "I only wish to be left alone. There is nothing else."

The tsunami is like a second retirement for my father. The chains that had bound him to the company unraveled and set him free, and now the disaster which has rendered his hometown unrecognizable — that too, somehow feels like the end of a long prison sentence. He had divested the best years of his life into supporting his families and contributing to the Japanese business world and on both levels, all that he had felt was suffocation and incarceration. During those years his wife avoided him like the plague, his children grew up hardly knowing him, and in her final years, my grandmother mistook him for her long-dead husband. One of his brothers committed suicide after some money trouble, and my father silently made all the funeral arrangements since his sister-in-law refused to have anything

to do with them. He had done his best by Miyagi and what remained in the end was neither nostalgia or joy and certainly not love, but the knowledge that he had done his duty.

"Papa," I called him the morning after the disaster. "Isn't there anything I can do?" There was no pause before he answered, the words coming out with the familiar, slow and lilting traces of the Miyagi dialect: "I only wish to be left alone. There is nothing else."

Kaori Shoji, a journalist based in Tokyo, writes about Japanese culture, fashion and film for publications in Japan, the U.S. and Europe.

DRIVING AWAY FROM A TSUNAMI

BY STEVE CORBETT

My spring break began on March 11, 2011. It wasn't technically spring break, in that I was due to report to the Board of Education office, though they didn't demand that I show up for work. I am a JET Programme English teacher in Ishinomaki City, Miyagi prefecture, Japan, employed by the city government. My office is lenient. I was anticipating having about two or three weeks of utter freedom. In celebration, I bought a bottle of Korean liquor to drink on the night of March 10, while I watched one of my favorite movies. I ended up having a little too much, and woke up the next morning with a slight headache.

My plan for the day was to head out to Ogatsu after finishing my laundry. Ogatsu is a town in which I lived and worked for exactly one year from July of 2009 to 2010. This would be my first visit since moving from the sleepy fishing village to downtown Ishinomaki seven months prior. As I sat in my bed, I decided to put my aching dome back on my pillow. Quickly, I changed my mind, popped up and got in the shower. That sudden impulse may have saved my life.

I got in my car in the late morning and set out for Ogatsu, by way of Onagawa, a port town enveloped by Ishinomaki. I got a coffee and some other things at the grocery store and got on my way. I bought a full tank of gas near Onagawa Station and kept going. I was through town and out on the semi-treacherous coastal mountain road to Ogatsu before 1 o'clock. I arrived in Ogatsu at around quarter after one, and I could see some of my former students leaving school after their graduation ceremony. I would have loved to talk to these kids, but for some reason I never even stopped

my car. I had gone back to the town, and met my goal for the day. I was gone as quickly as I had come.

I drove out of town and back to Ishinomaki along the beautiful Kitakami River, through the town of Okawa. Once safely back in the downtown area, I got lunch at the mall. I ate quickly and moved on. In my car, I was driving somewhat aimlessly when I decided to go back to the mall to read in the coffee shop. As I made a loop around the sporting goods store, my cell phone began to vibrate. I quickly noticed that it was a vibration pattern I didn't recognize, and assumed it was an alarm I had set by mistake. I pulled the phone out of my pocket and read a chilling message.

"Emergency earthquake alert. Earthquake occurs off coast of Miyagi. Prepare for strong shaking. (Meteorological Agency)"

I put the car in park, sat up straight, and put on the hazard lights. I had received this warning once, in 2010. That earthquake was big. This one probably would be too, I thought. It was.

The shaking started within seconds, gradually building its way up to full strength. The feeling was that of extreme turbulence for an airline passenger, except, you never expect that when you're in a parking lot.

Workers raced out of a sushi restaurant, and customers darted out of a drugstore. The hotel behind them was moving. Watching a 12-story building rock back and forth is a scary experience. With what seemed like an emphasized bang, all the electricity in the area shut off. Eight minutes after I received the text message alert, I turned on the radio and put my car in drive. I made an online post, asking how big the earthquake was, whether we were instructed to evacuate, and if any of my friends needed me to pick them up. The message I heard shortly after on the radio gave me all the information I needed.

The man's voice was frantic. The words were replayed on a loop. The reason he was urgently repeating the message was evident in the content. I had to listen a couple of times to make sure I heard him correctly. As I watched telephone poles continue to shake, more than 10 minutes after I stopped my car, I confirmed what I thought I heard. I heard it over the blaring sirens yet again.

"In just a moment, around 3 o'clock, a six-meter tsunami will reach Miyagi prefecture. Escape to the highest ground you can find."

As I hit the gas, I looked in my rearview mirror, thinking that I was going to see a wall of water. Cars were all heading away from the coast, and there was heavy earthquake damage on the roads. I was hitting my steering wheel, yelling, "Go!"

I didn't really understand what a tsunami was. I thought it was going to maintain the shape of a breaking wave, and eat the city whole. In reality what was happening as I drove to the top of the closest hill was just water filling in any place that was lower than it. At this particular moment, that water was supposed to be six meters above normal sea level. In reality, it was almost 40 in some places. A lot of things are lower than that.

I got to the top of a hilly residential development, and found that I wasn't the only person who had thought of that place. I waited and eyed a water tower, not knowing if the hill alone was high enough. I talked to some other people and asked them if this was real. Was there actually going to be a tsunami? Here? In Ishinomaki? Really? The answer I got was a shrugged, "I guess."

I sat in my car as it began snowing, and watched as everything turned white. I turned on the heater. I knew that gas would be important, but it was just too cold. There were now many people on the hill, trying to stay warm. We looked down on the city to see what was going on. One man showed me the television in his car. The camera was focused on the port of Kesennuma. The water was eerily low. It was pulling out of the harbor. The monster was collecting mass, preparing to redeposit it in a tragically different location. It scared me to watch, so I thanked him and went out to stand in the snow.

Hours passed and the snow stopped. The clouds parted. In the distance I could see a plume of smoke from what turned out to be the elementary school around the corner from my apartment. Someone pointed to an area near the highway, and what looked like flooded fields. I thought there was no way. I thought, "That isn't near the water. That's Hebita. There's no way the tsunami came that far. What about everything in between?"

I asked the man who showed me the television if he wanted anything from the convenience store. He asked if he could go with me. We drove down the hill and went to the mall. The roads were broken and the sky was dark. The mall was darker. The electricity wasn't back yet. I thought it would be up soon. The 7-Eleven nearby was closed. We finally found an open store.

There was a line of 30 people inside, and the staff was dutifully running the counters by flashlight, shouting prices across the store, using a calculator to determine the bills, taking cash. The customers were waiting in line with their baskets of whatever they could find. Nobody had water. Water was long gone. We got some chips, vegetable juice, and other supplies. We waited patiently for our turn, and I told the man that I was impressed by the civility of the people in the store. He proudly acknowledged. That was a sentiment echoed by many of my friends.

For a few hours, I sent messages to check in with friends. I would find out almost two weeks later that one of my close friends was already gone. I used social networking to reassure my family that I was safe. I thought I was going to sleep in my car, eat chips, drink vegetable juice, and go home the next morning. I was dead wrong.

I spent a couple more hours on that hill after we found our way back. One thing about an earthquake as big as the one that day is that it throws all the tectonic faults nearby into chaos, or at least it seems that way. There were so many aftershocks that I could not tell for days whether or not the earth was shaking at any given point. If someone cried wolf, saying there was an earthquake when there wasn't, my response probably would have been, "I barely even felt that one; it must have been a 4."

I finally decided to drive down from the hill after the sun had gone down. A friend of mine sent me a text message that the junior high school where she had been teaching was open as a shelter, and people were gathering. She told me she was going to stay there, and that I was welcome. I arrived alone at about 8 o'clock.

After a while, a student came and told my friend that someone was here to see her. We assumed it was the one other friend she also told to meet us at the school. We walked into the gym, and found a frazzled face from the past. It was someone we hadn't seen in a year, and didn't even know was in town. He had arrived in Ishinomaki that morning from Nagoya, and told nobody but his girlfriend that he was coming. We were shocked to see him. He was approaching the verge of hysteria. His girlfriend worked at a school that was deep in the jagged coastline, very close to the water. He told me he wasn't hopeful. Each of us had been to that school. I was his successor, and we each spent a year in that area. It wasn't a good place to be if a tsunami hit.

When he began to talk about what must have happened to her, the only encouraging words I felt morally allowed to say were, "You never know, man." Right around this time, the expected third friend arrived, and we decided to stick together as four.

That night, we rested in a hallway listening to a battery-powered radio. We were hoping for updates about areas in which we had friends. The aftershocks continued all night. The radio kept talking about tsunamis, how the water was still advancing. Someone came in and said there was water across the street. A decision was made to move everyone from the ground to the second and third floors. We started talking about whether we should get in the cars and head for the mountains. We decided to stay, and we set up shop in a classroom on the third floor.

We slept lightly.

Morning came early. We were walking around, trying to find things to do, listening to the radio, and thinking about breakfast by about 4:30. The first morning, we were delivered newspapers. There were pictures of different cities, villages and landmarks. I was utterly shocked to see the damage. Natori was flat. Kesennuma was gutted. I had a friend who had taught in Shizugawa last year until July. She flew in from America to attend the graduation ceremony and arrived in town on the morning of the quake. That city appeared to have been wiped off the map. I thought she had surely been lost.

We decided that we needed to find ways to stay occupied. My goals were to find all my friends, and to get some supplies. The friend who came to see his girlfriend the prior day had decided that he would go to her apartment for some things and he asked me to go with him. We walked toward the apartment before we were cut off by floodwater. The school that had become our temporary shelter was about a 10-minute walk from her place. It took us an hour. He got a bag of food and clothing. He had to walk through a flooded neighborhood to do it. I guarded his shoes and our other supplies.

In the afternoon, I walked to two elementary schools at which I taught English a few times a month. I let the teachers know that I was okay, and told them where I was staying. A nice family who owned a pharmacy let me come in to buy a toothbrush and a vitamin drink.

In the evening, I got in my car with the buddy who was last to arrive the previous night. We drove inland to his place to get more supplies. When I

walked into his apartment, I gasped. Everything was on the floor. You could not see the carpet. We took everything we thought we might need and made our way back to the school, where we took some of the supplies inside. We left the rest in the cars, which we used as lockers.

We collected as much information as we could, from people who had come from different places. We tried to establish who we thought would be okay. The next day, we went out looking. We compiled a list of people we knew. We marked whether they had been seen safe, whether someone said they had heard they were safe, or whether we didn't know.

Day by day, we checked names off the list. There was a rumor that another massive earthquake was supposed to strike within the next three days. We continued with the list, with the feeling that we may eventually have had to start all over. I began writing a letter to my parents just in case something should happen.

On the second night, two of my group of four went out to the Kahoku area near the Kitakami River to see if they could find information about some of our friends. They found out that there were survivors from the deep, rural areas we were worried about. There was a chance that my friend's girlfriend may have made it. We shared a few celebratory beers in the school parking lot while others slept.

The third day began with a two-car, four-hour gasoline run. We waited in a line for a hardware store to open so we could get a gas can, but in the end could not get any fuel. This trip ended up being a waste of gas except we saw some friendly faces from areas we had all but written off. It was a little comforting, but we now had a lot less gas, and just as many people to find.

That afternoon, I looked through the mall, which had also become a shelter. In the food court, I saw one of my students. She and some family members had set up camp in the crowded, dark dining area. She rushed over and we hugged, asking the standard questions about where the other was when it happened and if our things, and in her case family members, were okay. We parted, and I headed down the escalator-turned-stairs with the friend whose girlfriend we had nonverbally agreed we'd probably not see again. He had been tirelessly seeking any information about her area. As we turned the corner toward the maintenance exit, she was suddenly upon us. I gave him a silent thumbs-up as I walked out of the mall, leaving them to embrace. As

I turned out the employee door to the side parking lot, I clapped my hands loudly, knowing that if she made it, assumptions no longer applied.

Sleeping was starting to feel like exposing some vulnerability. I tried to keep it to a minimum to stay on my guard. On the fourth day, the friend who first invited me to the school took me back to her apartment to get more supplies, and to see its condition. The sliding doors had all fallen off of their tracks. The sink was ripped from the wall. Her metal desk had fallen over and spilled all of its contents onto the floor. An aftershock sent us running from the building. After a while, we got what we needed, checked in on a mutual friend in the area, and then made for the hospital to post our list of names, with a message telling all the foreign teachers to go to Hebita Junior High School, where we were gathering.

We arrived to a circus. There were people everywhere. Ishinomaki Red Cross Hospital now looked like a command center. Helicopters were flying in and out and tents were set up all over. There were thousands of people, and none of them were happy. News trucks lined the parking lot, which had more cars than I had ever seen in one place in Japan, other than Disneyland.

After we were told we would have to wait an hour or more to post our list, and while we contemplated just tacking it to a tree, I saw a scruffy Caucasian man carrying a large video camera. I tracked him down and when I approached and called out to him, he got a very suspicious look on his face, said something to his team, and they turned to walk away from me. I called out to them for a second time, and he replied, "Yeah. Can I help you?" I asked if they had any communication with the outside. He aggressively asked who I was, and surprised by his tone, I stuttered, "I … live in Ishinomaki. I'm an evacuee." A light went on in his eyes, and CNN anchor Paula Hancocks came up to me. She introduced the team, and eventually let me use her phone. I spoke to my mother for the first time during the disaster. I gave her a list of names of people who were safe to forward to other concerned parties. They asked if they could film me and air it on television, and I said that was fine. They scratched my back, so I'd scratch theirs.

We continued hearing more good news. One afternoon, a student at our shelter who was one of the people I met on top of the hill, with whom I had become friends during my stay, ran up to me and told me that my friend had just arrived. I anxiously trotted out to the parking lot and when I saw

that it was a very close friend about whom I had heard nothing, my jog turned into a full sprint and I had one of the most emotional hugs of my life. This other English teacher later told me that she had to climb to the roof of the school with everyone inside, and they all watched the water rise, filling up the valley to just inches below their feet. She watched as all of her possessions were swallowed by Mother Nature. She held out her arms and screamed toward the sky, thinking she was next. She was back home in Australia just a week later.

When cell phone service limped back just enough to send out a text message if you found the right spot and held your phone up above your head, I stood in the right spot holding my phone above my head as long as my battery would permit. I posted a short bulletin online, and sent out some text messages. It felt like the ceiling that had kept us in the dark for the last few days had been lifted, but we still couldn't scale the wall around us caused by all the supply shortages, the lack of gasoline in particular.

One of the e-mails that came through was from a friend in Tokyo who was particularly worried. She asked if I was okay and if I needed anything. I reassured her, "I'm fine. Just worried about another big quake."

"And radiation," she replied.

I implored her to explain herself. That's when I heard about the dire situation with the nuclear power plant in Fukushima, just south of Miyagi, maybe 70 miles from where I stood. I decided that maybe it was time to forget being rescued, and actively get out.

As I stood on a knee-high brick wall, trying to contact my embassy in Tokyo to see what they were waiting for (my Australian and Canadian friends were whisked away, and a bus came for the several Chinese people in my shelter), I saw a familiar face that stuck out in the crowd. A particularly large, athletic friend of mine was approaching on a bike with his girlfriend who was only visiting Japan, and I fired his name out over the crowd. They had also heard that there was spotty cell phone reception, and came to try it out. They told me that they had stayed two nights in our apartment building, and that our things were safe. Since I had written my possessions off days before, this was outstanding news. They also told me they were ready to get out of Dodge. This was better news.

The embassy had left us to fend for ourselves with nothing more than pa-

tronizing encouragement. We devised a plan and set our departure time for the next morning. The one hitch was that with the news of our apartments, I needed to go back and collect some things, particularly my passport and a change of clothes.

That evening, we finally confirmed the last of our English teaching friends, and we felt very good. Since we all came to Japan without our families, we felt a responsibility to each other. Everyone for whom we felt responsible was safe, and we were leaving.

I woke up in my car after an extraordinarily cold night. The threat of another great earthquake had gotten so deep into my head that I didn't want to sleep in the old school building anymore. If I was going to die in an earthquake, it wasn't going to be while I slept on the floor, especially the night before I planned to move.

The buddy who delivered the news about the apartments drove me into the destruction just a little after six in the morning. This is when I got my first really good view of the major devastation. We drove as close to the apartments as we could go, and jogged the rest of the way.

We ran through mud, debris and water. Everything was out of place. He guided me through the streets of downtown Ishinomaki, and showed me which ways were passable. At one point, we missed our street, turned on the next one, and came right up to a house and a boat on the road. He calmly said, "Too far." We came up to another building in the road later, and he said, "This one's okay." He turned and entered a hospital through the back door. We stepped carefully over medical equipment and broken syringes. Finally, we reached the apartments.

Trying to spend as little time as possible in the tsunami zone, I filled two of my bags with things, changed my clothes and packed for a possible permanent move home in just 20 minutes. My friend shared some news with four others who had been spending time there. They had not heard much about the Fukushima nuclear power plant, so we gave them a newspaper and told them we were leaving. We also told them we had heard from the embassy that our close friend who lived in the apartment in front of which we were standing, Taylor Anderson, had been confirmed safe.

I ran with my friend back to his car, each of us carrying a heavy bag. We stopped to pick up a few supplies we found on the road. I grabbed a life

jacket and he cut a length of hose for siphoning gas from my car to his. On the way out, we saw another man with a hose, gas can and a pump. When we got to the car, the gas door was wide open. I alerted my friend and he turned on the engine to check the tank. It was fine, thankfully. We never could transfer my gas to his car though, so we left Ishinomaki with just half of a tank.

My friends and I drove as far north as the gas would take us, and we were arguing frantically almost the whole way. We got to Hanamaki Airport in Iwate prefecture on our last drop. We caught a bus to Morioka, Iwate, where we changed to another bus. That took us to a small town in Akita prefecture. From there, we took a train to Aomori and stayed with a very nice family that had been host to one of our teacher friends when he studied abroad in high school.

That night, I watched a video of my friend Taylor's parents receiving the news that she was okay, and then read an article about how that was a premature report, and she had not yet been found. I got on the phone with her boyfriend in America and we shared information. My mood darkened. I left Ishinomaki thinking everyone on our list was okay, and now, one close friend was once again missing.

We stayed in Aomori for a few days, and then three of us flew to Korea, stayed one night, and made it back to America the next day. The other guy went to meet his mother in China.

I was at home with my family when I was told that Taylor Anderson's body had been found. I had prepared myself for that news just in case, but it hit me hard. I also learned that an older gentleman I know, a fire chief and the leader of my English conversation club, was still missing.

I flew back to Japan on April 12, and arrived the next day. Many friends at home assumed I was ome for good. People who never even considered that I might go back were shocked when I invited them over for some going-away pizza. Returning was never a question for me. The only question was when I would go. I spent a few days in Tokyo, waiting for two friends, and we came back to Ishinomaki together.

I now live without electricity or water at my apartment. My neighborhood is badly damaged and still has overturned cars, boats where homes used to be, and other debris all over. Down the street a couple minutes, you

can turn a corner and see a wasteland of rubble where almost nothing was left standing.

I drove back out to Ogatsu on the March 19 and saw the junior high school and a few other buildings standing, but badly damaged. I walked over the foundation of the house in which I lived for a year. I took a picture of the building where my supervisor worked, where I read the news and watched videos online full-time over spring break. I took a picture of the three-story building, complete with the bus that came to rest on top of it. The entire town was submerged; you can still see bedsheets in the treetops. Many people lost their lives there, but I know that some made it out. Those people who were lucky enough to escape lost everything they owned, their livelihoods, and in too many cases, loved ones.

Many people in this part of Japan woke up thinking that Friday, March 11, 2011, was going to be the kickoff to a great weekend and a long, warm spring break. The ones who lived to go to bed that night, as the snow-covered ground continued to rumble in suffocating darkness, knew that they should be grateful to be able to face the task ahead. Nobody wants to pick up the pieces after something like this, especially while mourning such profound losses. There is, however, no alternative. They have accepted the paradigm shift, and quickly learned how to live under these circumstances. Many people are almost back to normal, but some never will be. The one thing that I haven't seen though, is people quitting.

I am fortunate to have been here when this happened. I got to experience something historical. I, however, am still somewhat of an outsider to this situation. I spent some time in America while this region worked up the strength to stand on its own again. For all that everyone has lost, they seem ready to move forward. There are banners and flags flying all over town reminding the people that there is still a lot of work to be done. Everywhere you look, there are people chipping in. From morning of March 12, there were trucks with tanks of drinking water, neighbors with pallets of rice balls, and an endless flow of relief workers. I want to be a part of that.

One of the things I hear a lot is people talking about "getting back to the previous lifestyle." I know that I am just one person, but the reason I came back was to show my students that if people who didn't have to be here chose to stay or come back, there was a reason to believe their home would

get back to normal someday. If I could stand in a classroom for 50 minutes at a time, trying to make the students laugh without crossing any lines with their homeroom teachers, just like I used to, maybe they wouldn't think about what happened. The people here showed that they are willing to be strong and move forward. Like so many of my foreign colleagues, I want to do something to show them that I believe in them.

Steve Corbett is an English teacher in Ishinomaki.

THE VIEW FROM TOKYO

BY ROBERT WHITING

The powerful earthquake that struck Tohoku on March 11, and the tsunamis that followed, was something for the record books. Waves as high as 30 meters wiped entire towns off the face of the earth, carrying vehicles, buildings and debris several kilometers inland, destroying highways and other infrastructure in the process. The aftermath of the 9.0 quake, the strongest in the history of Japan, left approximately 24,000 dead or missing and more than 100,000 people living in cramped, crowded evacuation centers, often with no running water or other basic amenities, and fearing radiation from leaks in damaged nuclear reactors in the region. Hundreds of massive aftershocks made their daily existence all the more frightening.

The enormous scale of destruction along the Tohoku coastline dwarfed 9/11 and the Kobe earthquake of 1995. Many residential houses and condo buildings built on reclaimed land in Chiba prefecture sank or tilted due to ground liquefaction and had to be abandoned.

In Tokyo itself, there was far less damage. The sidewalks buckled in spots and there were cracks in the facades of some buildings, but that was about it. The trains were stopped while engineers checked for breakage and power reductions dimmed the world-famous neon signs of Ginza and Shinjuku. However, only the surrounding suburbs suffered rolling blackouts.

Me, I got off lucky. The apartment building where I live in Toyosu (on the sixth floor) incorporates the latest in earthquake-resistant technology. When the earthquake struck, there was some swaying back and forth, much longer than any quake I had ever experienced, but it was not unlike being on a lazy amusement-park ride. No books tumbled from my bookcase, no

lamps or vases fell over. And although it sits on reclaimed land not far from the proposed new location site for the Tsukiji fish market, the builders had taken the time to treat the soil and the building emerged unscathed.

During the weekend that immediately followed, Super Viva Homes, just down the street, was closed for damage inspection. There was some hoarding of basic commodities like mineral water and rice until local supermarkets began rationing them, but there were no other substantial inconveniences.

There were, of course, some scary moments — some of the major aftershocks (announced 20 seconds beforehand on my building's intercom system) caused heart palpitations and the reports of radiation clouds induced feelings of dread. I first learned about radioactivity in the air in the early-morning hours after the quake, when a friend of mine formerly in military intelligence, Hiroki Allen, emailed to say that the NSA's "Eye in the Sky" satellite had spotted leakage from one or more of the six nuclear reactors in Fukushima prefecture (in a site dubbed "Nuclear Ginza") and informed the Japanese government. Shortly thereafter, with the power out and cooling systems on the fritz at two of the plants, a state of emergency was declared in the area. People living within 12 miles of the Fukushima reactor sites were ordered to evacuate, while those living between 12 and 19 miles from the plant were told to stay indoors due to fears of exposure to radiation.

On that evening, my friend wrote that a radiation cloud was on its way to Tokyo. "Leak has been emitting since last night," he said in an email, "and it is still not under control. A US nuke team was flown in to help get this thing under control, but that is not public record yet. It will come out later, I think. Anyway, the leak from last night means it is hitting us about now. I am not going outdoors for a while. There is nothing, no events, parties, sports, movies, etc that are worth getting more exposure to radiation. The stuff travels far, very far. Wind is all over the place, but we must assume it is heading towards a major area like Tokyo, a city, a heat source. If you absolutely have to go out, wear a mask, and a hat if possible. Take a shower immediately after you return home and wash your clothes."

Another friend, Tokyo-based management consultant Mitch Murata, advised me to get my hands on K1 (potassium iodide pills) and to buy a related list of items in the event iodine-131 makes an appearance.

I was getting an education. Of the many radioactive gases that can be emitted during a nuclear- plant release, you see, iodine-131 causes special concern. Because iodine is readily accumulated in the thyroid, exposure to radioactive iodine can lead to serious, concentrated doses in the small, metabolism-regulating gland. "For years," Mitch writes, "scientists have considered prescribing community-wide ingestion of potassium iodide in regions downwind of a serious nuclear accident to block the thyroid's uptake of radioactive iodine. The problem is that the symptoms of acute radiation poisoning express themselves years later as thyroid cancer which, unfortunately, gives every incentive to the government to indicate that there is nothing to worry about. "

The radiation is why Mitch decided to move his wife and son to Nagoya, 200 kilometers west of Tokyo, before returning to the city to lend a helping hand. He said that two of his friends had already made the move. He said the Japanese government and Tokyo Electric Power Co. (TEPCO) had been consistently denying and then admitting that greater problems exist with the nuclear reactors and that the numbers of radiation poisoning victims in Fukushima were increasing.

By Sunday (March 13), a lot of other people were arriving at the decision that it was time to go. The French Embassy had sent emails to citizens recommending that they leave Tokyo, citing the risk of further earthquakes and the uncertainty about the situation of damaged nuclear plants in Fukushima. The Germans and Australians followed suit. Some Tokyo-based foreign companies were ordering their employees out of the city and, in some cases, out of the country, while Air China canceled flights to Tokyo from Beijing and Shanghai.

By Monday, foreigners in Tokyo were shelling out thousands of dollars to fly to Hong Kong, Singapore, and other points in Asia considered safe. From March 12 to March 18, Japanese immigration records showed that a total of 224, 418 foreigners left the country, of which 45 percent were on tourist visas. In other words, more than half of those who jumped ship were non-tourists. That number, and the ratio, was more than double the totals of a week before.

Their concerns were no doubt exacerbated by the fear mongering that was going on in press reports out of Japan which included frequent refer-

ences to the Fukushima nuclear crisis being another Chernobyl and other alarmist declarations. *The New York Daily News*, for example, ran an image of a Japanese person wearing a gas mask on the front page, with the word "Panic" in huge black letters. BBC's website ran photos of Tokyo commuters wearing face masks, or "radiation masks" as the site described them, implying that they were trying to protect themselves against radiation when in fact they were just the annual prevention measure against pollen allergies.

CNN International reported fewer people in the downtown streets in Tokyo, attributing the decrease to a "mass exodus" from the metropolis — people "fleeing" rather than perhaps just being told to stay home by their companies or choosing to stay home due to difficulty using trains. CNN accompanied reports with videos of a supermarket with the caption "Barren shelves become common across Japan." "Nuclear cooling has failed," ran a CNN banner. "Radiation cloud could reach U.S. Friday."

Neal Cavuto of Fox's "Your World With Neal Cavuto" deserved some sort of prize for misreporting when he showed a screen graphic depicting two nonexistent nuclear power plants in Japan, including one in the Shibuya quarter of Tokyo called the "Shibuya Eggman," which was actually a nightclub.

But perhaps the most hysterical was a story in the March 17 edition of *The Sun*, entitled "Nightmare warning to Brits as nuke crisis continues, Get out of Tokyo now." It featured a telephone interview with a Tokyo resident, a British woman, who described Tokyo as "a city in fear of nuclear catastrophe — with food, water and fuel running out and radiation levels from Japan's stricken nuclear reactors reaching ten times normal."

In an article bearing a subtitle, "My nightmare trapped in City of Ghosts — in Tokyo," the woman was quoted as saying, "I'm stuck in a part of the city that resembles a ghost town. Normally the streets bustle like nowhere else on earth. But I look outside now and they are completely deserted. It's like London in the zombie movie *28 Days Later.* The streets are silent. We live near the center of Tokyo and yet there is no movement at all. ….There is no petrol, no water, no food …. What if every day the radiation continues to double …." This was followed the next day, March 18, by a Reuters wire service report that said millions in Tokyo remained indoors, fearing a blast of radioactive material.

I rode the subways in Tokyo that day — the Yurakucho line from Toyosu to Yurakucho — for a dinner meeting at the Foreign Correspondents Press Club of Japan and saw something completely different. The subway line was operating at 80-percent capacity. The cars were as crowded as they always were and so were the stores I visited, including Bic Camera, the multi-storied electronics store in front of Yurakucho Station, although the indoor lighting had been dimmed somewhat. Salarymen were at work. The schools were open (on a voluntary-attendance basis) and kids were playing baseball in the park across the street from my house. Aside from some food rationing at supermarkets and convenience stores in the area, life largely continued as normal, and I could not find anything about the radiation danger to Tokyo in the Japanese press. The radiation level in Tokyo that day was 0.053 microsieverts, according to *Asahi Shimbun*, which ran daily readings, and this was lower than the annual average of 0.078. If there were any people staying home in other parts of the city it was probably because of the electricity blackouts, which caused some of the commuter lines from the suburbs to stop.

Still, I must admit, my wife and I stockpiled food and water, we bought Isojin gargle, and iodine soap and tablets, like many other people living and working in Tokyo. I was deluged with messages from relatives and friends, wondering if we were okay and wanting to know when we were going to evacuate. Friends in California suggested strongly we fly back to be with them. So did friends in Stockholm, where my wife once worked with the United Nations. But we really had no choice. My wife is Japanese and she had relatives in the city and its environs who needed our help. On the day after the quake her niece had to bunk at our apartment, trekking there after a two-hour hike from the Hamamatsu office where she worked, because the Keihin Tohoku line to her home in Omiya was shut down for the weekend. My wife's brother was in ICU at the hospital after an automobile accident and needs daily attention. We never really considered leaving.

Emails from friends and acquaintances in Tokyo helped put the weird disconnect in perspective. The aforementioned Hiroki Allen was particularly valuable. Hiroki is a West Point graduate and former special ops officer who now works in Tokyo as an equities trader and moonlights as a liaison and interpreter between the U.S. Military in Japan and the Japan Self-De-

fense Forces. He also knows his nuclear reactors, having been trained during his Army days to sabotage them.

That radiation cloud headed for Tokyo turned out to have little harmful radiation in it and Hiroki, having done his research, pointed out that when Hiroshima was hit with an airburst atomic bomb attack in 1945, radiation effects on Kobe 250 kilometers away were minimal, and not recorded. And when Nagasaki was hit with a plutonium bomb, Fukuoka, under 200 kilometers away, did not suffer radiation effects either. "The Fukushima reactors," he said, "were much smaller in power and effect than an atomic bomb, so, I believe we will be OK."

When another radiation cloud hit Tokyo on March 19 and concerns arose about radiation in Tohoku-produced food, Hiroki sent a longer note, expressing, in rather strong language, his views on those who fled the city for safer ground as follows: "Fools with no background in physics, engineering and military training have no idea what they are talking about, and they freeze at the word 'radiation.' These ignorant people believe radiation is some kind of death ray that kills upon contact. Completely wrong. High-intensity gamma rays, perhaps. Wind-blown radioisotopes, no way."

At worst, radiation is a mild carcinogen. Cigarette smoke is proven to be a nastier carcinogen than radiation. The air in Hong Kong is filled with other nasty smoke such as sulfurous fumes from Chinese factories, heavy-metal vapor from industrial activities in Guangzhou and a lot of automobile exhaust gases and cigarette smoke. Anybody who evacuated to Hong Kong from Tokyo to avoid health issues made the wrong choice, and is ignorant of the dangers of Hong Kong air.

It has been over a month since the earthquake. No blowups happened and no deaths from radiation have been reported. TEPCO can hide things, but deaths are difficult to cover up. There have been none from radiation, obviously.

As for food safety, I am not concerned. If anything, the Japanese government overreacts to food issues. This is the only nation that tests all beef for BSE, or mad-cow disease. If radiation is a potential problem, all food will be tested for radiation.

As for the 50-mile exclusion zone the American Nuclear Regulatory Commission has demanded, there seems to be little scientific evidence

backing it. Fifty miles is a round number, like 100 miles. It was easy to claim "50 miles," and the *Wall Street Journal* points out that many do not agree with a 50-mile exclusion zone.

Controversial data exist regarding cancer rates after Hiroshima and Nagasaki, and most of it is flawed because it ignores the Japanese diet with its carcinogens such as high salt content and food grilled over charcoal, and the hard-drinking culture that naturally led to higher liver-cancer rates. Hiroshima and Nagasaki are seriously hard-drinking areas of Japan, as anybody who has ever been to those cities knows.

When reports of explosions at Fukushima hit the news and caused another big stir, another electronic missive, which helped calm fears, came on March 16 from Eric Rockett, a nuclear engineer, who wrote, among other things: " The explosions at the plant are caused by hydrogen gas igniting with oxygen — as a result of the cooling process. It is not the fuel rods or fuel that is exploding; this is important because these hydrogen explosions are NOT causing particulate radiation (that is carried by rainfall or on the wind — which is what made Chernobyl such a major disaster). The danger of radiation contamination to the public is very small. Radiation levels at the main gate of the Fukushima nuclear power plant are at about 0.6 msv (millisieverts) per hour (although they did rise to 1 msv/hour today but have since subsided). To put this into context, an X-ray subjects one to 0.2 msv, living in Tokyo for a year to 2.4msv and living in Washington for a year several times the level of Tokyo because of the natural presence of radon gas. So if one stood at the main gate Fukishima plant for 2 hours and 25 minutes, that would match an average year of radiation from living in Tokyo. The reality is that all radiation however small from an event like this is considered unacceptable, hence the 20km evacuation zone, but in the absence of particulate radiation, of which there is no evidence as yet, the further one is from the site the less significant it is. The real danger to the Japanese public is very, very small but the media have been very poor at explaining this."

Still another email correspondent, Gerhard Fasol, a Cambridge Ph.D. and specialist in radiation, announced he was not leaving Tokyo and that the measurements in Tsukuba, a hour's ride southwest from Fukushima, showed about the same radiation level an average Italian is exposed to all

the time, living in houses where radon accumulates.

The U.S. State Department was aware of this and although it urged its citizens to avoid tourism and no-essential travel to Japan because of the power outages and other difficulties related to the quake, the U.S. Embassy in Tokyo simply advised American residents of Tokyo to "follow instructions from GOJ and relevant local communities," remain calm and stay the course. (The British Foreign Office, and embassy in Tokyo, did the same.)

However, it was then discovered that one embassy official had quietly sent his family out of Japan. Thus it was decided that those who wanted to leave would be provided with a charter flight out of the city.

As one U.S. Embassy employee put it, "There are goat ropes, nut rolls, then there is what we are going through. Actually the embassy isn't evacuating — they have given "voluntary evacuation authorization" for dependents. Mostly it's because many of the embassy dependent wives and children who haven't experienced earthquakes are driving the staff nuts. Many dependents have already left but as next week is spring break and the schools (at least international ones) were shut down this week. So it amounted to an extended vacation which many took advantage of. The Ambassador said the main reason the government decided to do this is to help relieve stress on the dependents (which I understand) and to let the sponsors (DOD, DOS — those of us who work in the embassy) concentrate on their duties and responsibilities without family distractions. I can also understand that."

In light of all this, the only reason I could conceive of for anyone to leave Tokyo is that it was simply inconvenient to do business there for a while with the periodic electricity stoppages outside the Tokyo wards which also affected the public transport system for employees commuting in and out of Tokyo Central; the reduction in electricity usage which caused escalators to stop running and for subway stations to be dimly lit; as well as the shortages of certain products such as AAA batteries, water, bread, rice, fuel; and finally, the absence of certain foreigners (and Japanese, it might be added) with whom to do business in Tokyo.

It was Fukushima where life was truly miserable, where vast crowds of people huddled in shelters without food, heat or water, sleeping on hardwood gymnasium floors or city center hallways and depending on donations for a hot meal and a warm jacket and going without basic items like

toilet paper and sanitary napkins. That was where the living hell was. Not Tokyo..

But many people continued to leave the capital. From March 19 to March 25, a total of 148,930 foreigners departed, of whom 81 percent were not tourists. From March 26 to April 1, 79,228 foreigners left, of whom 72 percent were not tourists. From April 2 to April 8, 58,794 foreigners left the country, 55 percent of whom were non-tourists.

Throughout the crisis one of the more remarkable phenomena involved the difference in reporting styles between the local Japanese and the Western media in covering the unfolding drama. Whereas most foreign media continued to focus on the nuclear reactor problems and the idea that things were getting out of control (alarming family and friends back home who implored their loved ones to flee to safety), the Japanese media had a basic view that was just the opposite — that the situation would be resolved, and, as a result, focused more of their attention on the evacuation centers and the suffering of the evacuees.

Of course there were exceptions. The weekly magazine *AERA* headlined a photograph of a rescuer in a protective face mask with, "Radioactivity is coming." But the magazine was widely lambasted for scare mongering and the editor was compelled to post an apology on the magazine's website, adding a message of condolence to the Tohoku victims. But all in all, the tone was much more subdued in Japan's media, symbolized by the matter-of-fact approach of NHK, Japan's quasi-governmental TV network and Japan's major daily newspapers like Asahi Shimbun.

Part of this difference was due to competition for ratings and circulation, at least in the bare-knuckled word of the American media, where sensationalism attracts more attention. Consider an ABC News headline from March 19 that blared, "Radiation in food supply." The radiation detected in milk and vegetables from the Fukushima area was indeed at a slightly elevated level, but not particularly dangerous. Drinking a year's worth of the milk in question would be the equivalent of a person getting a CAT scan. Moreover, the radiation was found only in milk and spinach taken from farms very close to the nuclear plant, which in no way whatsoever equated to the "food supply". CNN's Madison Park, a day earlier, had compared the problem at Fukushima with Hiroshima, which, as we have seen, was also misleading,

because the A-bomb was far more powerful and wrought more havoc than a damaged nuclear reactor. In fact, the "radiation clouds" released thus far at Fukushima Daiichi had the equivalent of a single dental X-ray, but invoking Hiroshima was more dramatic.

Of course, some of the differences in reporting were also perhaps related to the language barrier and misunderstanding of certain technical terms. In more than once instance, chemical explosions were described as far more sinister and dangerous "nuclear explosions." Melting of fuel rods was reported as a more serious "meltdown." Microseiverts were mistaken for the more harmful milliseiverts. Conflicting information from TEPCO and the Japanese government, both of whom were less than crystal clear, or forthcoming, also added to the confusion. "The reactor is not necessarily in a stable condition," to cite one quote from TEPCO, was a masterpiece of understatement. Then there was the indecisiveness of Prime Minister Naoto Kan and his DPJ colleagues, still new to wielding power. As one acquaintance of mine put it, "Think Obama during the BP crisis — squared."

One problem was that Japan's leaders have never been very good at communicating with the public. Their standard MO was operating behind closed doors in secrecy, and they really did not know how to deal with the public — as witnessed by the initial refusal of the head of Toyota to testify in Congress in 2010 over the problem of defective gas pedals in Toyota cars. The head of TEPCO was a total basket case, spending the first few weeks of the crisis in hiding.

Moreover, in comparison to Westerners who were less trusting of government, Japanese were more inclined to comply with what the authorities wanted without asking too many questions — a product some say of the country's long history of feudalism, highlighted by 265 years of the Edo *bakufu*, where daily life was circumscribed by an all-powerful Tokugawa shogunate.

Generally speaking, it could be argued that reporting by Japanese outlets was more reliable and more thorough than that of foreign media companies because they were able to devote more resources and more staff to their stories. Some foreign news-gathering organizations had a sole reporter, who was often working through a translator. Thus, Japanese reporters had more access to information and more space in the newspapers and magazines, as

well as more television airtime, to report their findings.

But even the Japanese media were flummoxed in mid-April when the governmental Nuclear Industrial Safety Agency suddenly raised the Fukushima crisis from a 5 to the top 7 level on the international scale — on par with Chernobyl. This despite the fact that the majority of nuclear experts had made it clear early on that there would be no "Chernobyl" in Japan. As was reported in several venues, including the *Los Angeles Times* as early as March 15, the design of the Japanese reactors was simply superior to that ancient Soviet design (in part because the Russians built Chernobyl to allow harvesting of material for nuclear bombs). Radioactive smoke was inevitable at Chernobyl because it had no containment structure, whereas the nuclear reactors in Japan do have containment structures. Risks abounded, but radioactive smoke in Japan remained unlikely. An explosion had occurred at Fukushima, but it was chemical and spread material over a relatively small area, unlike at Chernobyl where an explosion lifted radioactive material 10,000 meters into the air. At no point were the levels of radioactivity in Tokyo a risk to public health.

Nonetheless, the new rating scared the hell out of everyone. Stanford closed down its Kyoto Institute for the rest of the school year. Qantas decided to divert flights to Hong Kong as cabin crew refused to land. Risk management groups were busier than ever finding new sites for panicking Tokyo-based companies.

The Japanese government explained that it was simply saying that the crisis itself, and the contamination around the facility, seemed to be worse than it had previously thought. But perhaps it was also playing politics. Observers noted that the new rating was declared only after regional elections were held.

Hiroki Allen chimed in with the observation that "Perhaps nuclear reactors are like figure skating. All scores are subjective, with very little to clearly distinguish between a performance that scores an 8 versus another skater getting a 9 or a 10. Judges can arbitrarily make calls and they do not have an obligation to answer for the scores they indicate. DPJ figure skating and nuclear reactor judge says 7 now, after claiming a lower rating earlier. The judge from the United Federation of Planets may rate it at a different level. The radiation in Tokyo may have been twice what it once was, but was still

less than London, New York, and half of Hong Kong's …. Hard to say exactly what is going on now, but something smells …. I noticed that the Kan administration rammed through a computer eavesdropping bill during the middle of this crisis, with hopes that everyone is distracted and the overseas media doesn't notice. Only the tabloid press picked up on it."

Summing up, I felt guilty about being in the relative safety and comfort of Tokyo in those weeks after the terror of March 11. The biggest daily inconvenience I suffered in Tokyo was when I had to walk down the stairs to get home from my daily workout at Do Sports Club because the escalator was shutdown to save on electricity. And I had also lost the beautiful nighttime view of the Rainbow Bridge across the way from my apartment because all the lights, except for two at the very top, had been turned off.

We did not have to put up with hours of blackouts. We did not have to make daily checks to see which train lines were running, nor did we have to endure hours of waiting in line for an allotment of drinking water or gasoline for our cars. We did not have to sleep on hard floors next to total strangers or tolerate the loss of privacy or bear hour upon hour of evacuation-shelter boredom without complaint — which was what tens of thousands of people in Tohoku were doing, with impressive forbearance.

My respect for them, as well as for the Japan Self-Defense Forces, the fire department, the Japanese police and the courageous workers who are toiling at the reactors is heartfelt — as is my admiration for the U.S. personnel who backed them up.

As I said before, it has been an education. I know more about microsieverts and becquerels than I ever did before this crisis. And I know the difference between a nuclear explosion in a nuclear plant and a hydrogen explosion in a nuclear plant. But more important, this whole experience has moved me, my wife and my circle of friends to help others more — to join charities and volunteer groups — and to promise not to complain about the lack of air conditioning when the summer heat arrives.

Robert Whiting is the author of Tokyo Underworld*,* You Gotta Have Wa*, and* The Meaning of Ichiro.

BENDING MISFORTUNE

BY SHIJURO OGATA

At 2:46 p.m. on Friday, March 11, 2011, when the earthquake struck Japan, I was luckily at the study in my house in western Tokyo. Optimistically assuming that the quake would be short and small like many previous ones I had experienced, I was tempted to stay there, but my son urged me to leave immediately, while smaller and lighter books, particularly paperbacks, started to fall from the bookshelves. Though I knew Tokyo was not its seismic center, the quake and aftershocks were the biggest I had ever experienced.

Usually after any earthquake, our TV reports almost immediately its seismic center, its magnitude and the names of the places affected with respective degrees of intensity as well as the possibility of tsunami. But on March 11, the TV only kept sending tsunami warnings indicating the expected timing of tsunami at widespread locations, mostly on the northeastern coast of Japan's major island of Honshu.

That evening, my wife had to spend five hours to return home by car from her office because of the traffic jam not only on the major roads but also through smaller alleys. Later we were told that so many people in Tokyo had to walk home or stay overnight at their offices, homes of friends or relatives, or even hospitals.

One month after the initial attack of the earthquake with occasional rather strong aftershocks, more than 13,000 persons were reported to be dead, more than 14,000 thousand still missing and more than 221,000 households destroyed. In Tokyo, 250 kilometers away from the areas most affected by the earthquake, there was some confusion for the first few days.

In the evening of March 11, the Tokyo Electric Power Company, TEPCO, should have appealed to all electricity consumers to save electricity voluntarily, but as much as possible considering their own needs and schedules. Instead, cabinet ministers, already in blue uniforms and looking like janitors, announced solemnly through TV the initiation of "rolling blackouts" for specified groups of areas. But most of these planned blackouts were not carried out as the demand for electricity turned out to be within the supply capacity of TEPCO. No blackout was certainly better than any blackout, but this unpredictable "unplanned planned blackout" upset many activities, particularly train services.

There was also some rush to buy daily necessities and gasoline, but nothing like the struggles for toilet paper way back in 1973 (at the time of the oil shock), and this shopping fever calmed down rather quickly. But train services have been reduced, many lights remain off, and quite a few escalators and elevators have stopped. Many events, such as symposia and concerts, have been canceled in order to express our condolences to the victims and/or due to the cancelation of the visits of foreign speakers and musicians and also to save electricity. Such *jishuku* (voluntary restraint) seems to be a bit too much, excessively dampening personal consumption and commercial activities even in the areas not affected by the quakes.

Reading and viewing the constant flow of the news from not only Japanese but also foreign media from morning to night, we have discovered and learned many lessons.

First of all, we are overwhelmed by the almost uninterrupted flow of messages of sympathy from friends all over the world sent by email, fax, telephone or letter. I am particularly touched, among many others, by one of the first emails reaching me on the evening of March 11 from the grandson of the unsuccessful secret Chinese negotiator for peace between Japan and the Chinese regime in Chungking during the final days of the last war; a telephone call from the former associate dean of the Fletcher School where I studied more than 50 years ago; and an email from an Indian former high-ranking IMF official who happened to find my name quoted in the *Financial Times* although I had not met him for about 30 years.

Many rescue teams and financial donations are coming in from more than 130 countries, not only high-income developed countries but also

developing countries which had been recipients of Japanese development assistance, despite their relatively low income per capita, including the Afghan city of Kandahar, and even from North Korea, a country which has no diplomatic relations with us. These developments demonstrate that international assistance is not one-way but two-way traffic, and that the countries of the world are closely interdependent (*mochitsu motaretsu*) regardless of political differences.

In Japan there are those who are skeptical about the importance of development assistance to other countries on the grounds that Japan has its own economically needy sectors and regions that should be taken care of. Those inward-looking people should be reminded of the Japanese phrase *nasake wa hitono tamenarazu* (kindness to others will benefit not only others but also yourself).

We are impressed by the massive assistance from the United States called Operation Tomodachi, and I myself have taken note of the news that after assisting effectively in the reopening of Sendai airport, the American contingent quickly withdrew to Okinawa without drawing attention to their contribution at the reopening ceremony of the airport, a sensitive gesture that old Japanese like myself appreciate most.

While we are very grateful to many foreign friends for their generosity, I felt a bit uncomfortable with the news of official warnings by many governments to their nationals residing or traveling in Japan, even to those far away from tsunami- and/or radiation-affected areas, to leave Japan. Several embassies have closed their offices in Tokyo and moved to western parts of Japan, though some of such warnings were later lifted.

Of course, we are also responsible for such a development. The information released by TEPCO and our government was quite inadequate and insufficient, particularly about the possible impact of the nuclear accident. Probably they themselves were not well informed, or they tried not to cause any sensational, panicky reaction. But the poor flow of information tended to create suspicions that they might be hiding the truth. The chief spokesman of the Japanese government in Tokyo appeared on TV until recently in a janitor-style uniform, probably intending to demonstrate his readiness to cope with the crisis, but this gave foreign viewers a misleading impression as if Tokyo itself was in danger.

One foreign correspondent who visited the damaged areas wrote me afterwards that he was "filled with greater respect and admiration for Japan than ever — TEPCO and the like aside." This comment is a fair observation concerning Japanese responses to the recent disaster, which have exposed both the best and the worst of Japan.

On the positive side, there is a quiet dignity in the calm, orderly, disciplined responses of the tsunami victims despite their unprecedented hardship and losses. In reply to a question posed by a Chinese reporter about the causes of such calm, I said that it must be the combination of the following factors.

First, there is a traditional fatalism in Japan towards natural disasters after suffering from many typhoons and earthquakes over the centuries. Second, Japan is a relatively egalitarian society in terms of income and education, though disparities are said to be widening lately between individuals, families and regions. Third, the freedom of expression of all sorts helped minimize the possibility of violent expressions of discontent. Fourth, there is lingering confidence among the general public in the efficiency of public and semipublic services, such as transportation, distribution, communications, medical care, firefighting and security, though the public confidence in political leadership is declining. I should have added ethnic homogeneity and religious tolerance, though I am by no means xenophobic.

Every day we are moved by the news of courageous victims helping each other by overcoming their personal sorrows. They have done this with the assistance of civilian volunteers and local officials, and also young children in evacuation centers who not only study and play cheerfully, but also even publish handwritten wall newspapers to encourage their parents. Unlike in the case of the 1995 Kobe earthquake, our defense forces were called in immediately after the quake, and they have been working hard to remove destroyed houses and other buildings and to find the missing and dead.

On the negative side, we are frustrated by the poor handling of our nuclear crisis. Despite the fact that Japan is the only country which suffered from atomic bombs, we ordinary Japanese have been too complacent and ignorant about the problems of nuclear energy, having left everything to small groups of specialized scientists, TEPCO and other power companies, and also their supervisors such as the Nuclear and Industrial Safety Agency

(NISA) and the Ministry for Economics, Trade and Industry (METI).

Though I am one of those scientifically ignorant Japanese, I can see serious problems in TEPCO and NISA and the like. Though TEPCO has produced prominent business leaders in the past, I suspect that most, if not all, of them were trained and promoted mostly in the headquarters. They mainly deal with politicians, bureaucrats and business circles without sufficient involvement in the nuclear operations. Likewise, the mainstream METI officials might have little direct experience in the supervision of nuclear operations. I even wonder if the relationship between supervisors and supervisees including a limited number of manufacturers of nuclear plants might have been too close to be properly supervised. There is clear evidence of the fact that nuclear research and operations have been handled almost solely by the group of the people we call *genshiroyoku-mur*a (nuclear village). It can be said also that *genshiryoku-mura* is one of the last bastions of the Iron Triangle of politics, bureaucracy and business, all established during the too long reign of the Liberal Democratic Party since it was established in 1955 until its ouster from power in 2009.

During the second blackout in New York in the mid-1970s, if I recall correctly, the chairman of Con Edison single-handedly responded to the questions posed by TV newscasters. But in 2011 Japan, press conferences have been handled mostly by middle-level managers of TEPCO and NISA who did not look and sound so reassuring. TEPCO's president emerged one month following the earthquake after being hospitalized and only expressed repeated apologies, but did not offer a clear explanation of the accident. Such poor public relations, errant leadership and weak oversight are symptomatic of weak governance regarding Japan's nuclear operations.

However, we cannot blame TEPCO-NISA and the like alone. Many of us are increasingly less interested in the study of natural sciences despite the fact that we still have a few outstanding scientists who have recently received Nobel Prizes. On the other hand, all kinds of sectionalism seem to prevail not only in the bureaucracy but also within business entities with almost exclusive concentration on their own sectors and mutual nonintervention to each other's sectors. The combination of decreased interest in natural science, *rika banare*, and sectionalism at the expense of developing broader perspectives have facilitated the emergence of a secluded nuclear

village.

Before 3/11, the Japanese economy was recovering with improved corporate performance, but at a bit slower pace than last summer and under continued deflation. Prior to the recent disasters, there were at least three important reforms necessary to promote recovery. First, increasing income distribution to labor in order to strengthen personal consumption and thereby domestic demand in general. Second, formulating concrete plans for fiscal consolidation through reform of our pension and social security schemes. Third, initiating agricultural reform to prepare for Japan's entry into more free-trade agreements and even the Trans-Pacific Partnership.

The severe damage of the earthquake and tsunami, estimated at some 25 trillion yen (and possibly more) versus 10 trillion yen for Kobe in 1995, will inevitably delay such reforms. In addition to immediate rescue operations, the reconstruction of devastated areas and the recovery of production facilities in all directly and indirectly affected areas with some restoration of electric power supply are all urgently called for, while overall review of our policies on energy and the environment should start with particular focus on the degree of future reliance on nuclear power.

It will be no easy task to finance these costly operations under the expected decrease in our trade surplus and increase in domestic prices, resulting from such factors as reduced domestic production, foreign hesitation to visit Japan or buy Japanese products suspected to be affected by radiation, increasing demand for materials required for reconstruction, higher prices of commodities, widening interest-rate differentials from other countries, and possibly a weakening yen. The decrease in trade and current account surpluses means a decrease in domestic savings, while higher prices tend to raise interest rates.

Of course, easy monetary policy has to be maintained, while outdated or not urgent programs pledged by the Democratic Party of Japan (DPJ) at the general election in late August 2009 have to be abandoned or postponed and additional steps to increase tax revenue will have to be taken a little later. Even then, we have to make every effort to accommodate such additional financial needs despite decreasing domestic savings and higher financial costs, on top of our already very high level of public debt. This should be done without direct monetization of Japanese government bonds

by the central bank and without undue exposure to the risk of volatile foreign investors.

Politically, the recent earthquake, at least temporarily, saved the Kan cabinet. It had been on the brink of collapse before 3/11, due to strong opposition in the Upper House of the Diet and a lack of unity within the party. We often say *kaze ga fukeba okeya ga mookaru* (if the wind blows too strong, bucket-sellers will gain). Kan has become such an okeya after the quake, but his tasks are formidable.

Despite the DPJ's slogan, *seiji shudo* (politicians' leadership over bureaucracy), the inexperienced DPJ politicians must be learning by now the usefulness of bureaucratic expertise; the bureaucrats in turn must be recognizing by now the urgent need to overcome their traditional sectionalism to work jointly to mitigate the crisis. It is also hoped that both the ruling parties and opposition will realize the need to make practical compromise on urgent issues, by overcoming their minor differences, even without forming the so-called grand coalition, and that business circles also will recognize the importance of better corporate governance by learning bitter lessons from TEPCO's debacle.

These days my standing joke about Japan has been "Japan is a country of good soldiers but poor commanders". The developments after the recent earthquake seem to prove sadly that I am right. It is urgent to produce more reliable leaders while maintaining our still relatively egalitarian society. Probably, we have to carry out constructive reform of our educational system to nurture such leaders.

After reaching the stage where Japanese themselves started to believe in "Japan as Number One" during the 1980s, our excessive optimism and arrogance led Japan to the financial bubble which later burst and ushered in prolonged stagnation over the past two decades. Nevertheless, before 3/11 there was widespread complacency and a lack of urgency about Japan's deep-seated problems.

As I was recently quoted in the *Financial Times*, this crisis might be one of the last chances for *wazawai wo tenjite fuku to nasu* (bend misfortune and turn it into happiness). As a retired Japanese who was fortunate enough to have participated in the unusual process of Japan's postwar reconstruction, I still hope that such a positive turnaround will be possible. Like the *kurofune*

(black ships; shorthand for the Western threat/challenge) of 1853, I hope the earthquake of 2011 can serve as Japan's wake-up call and galvanize Japanese into constructive action and overdue reforms.

Shijuro Ogata is former deputy governor for international relations of the Bank of Japan and deputy governor of the Japan Development Bank.

TRAIN TO NOWHERE

BY KUMIKO MAKIHARA

KORIYAMA, JAPAN — On the first day of Golden Week, Japan's string of national holidays that start in late April, I boarded the just reopened bullet train from Tokyo to the quake-struck northeast. I have taken that line many times before without special thought, but this time I savored the ride as a moving testament to the speed of the region's recovery. The conductor apologized that the train would be slow through some of the damaged areas. But considering that the March 11 temblor left the route with twisted tracks, leaning utility poles and stations with collapsed ceilings, it seemed like a miracle that the supermodern transport service was back at all.

I didn't sense that rosy feeling of progress where I got off in Koriyama, a major city in the center of Fukushima prefecture, about 60 kilometers west of the heavily damaged Fukushima Daiichi nuclear power plant. It doesn't seem right to compare degrees of suffering among the regions devastated by the earthquake and tsunamis, but it would be fair to say that Fukushima is tragically shackled in its efforts to move forward by the additional burden of hosting the reactors. In late April, the governors of the two other hard-hit prefectures, Iwate and Miyagi, handed in reconstruction proposals to an advisory panel led by Prime Minister Naoto Kan. But Fukushima's governor, Yuhei Sato, did not, saying dealing with the power plant took precedence. That may be, but to many residents the politician's inaction came across as yet another sign of the prefecture's isolation from the nation's recovery efforts.

"We've suffered four times over: from the earthquake, tsunami, radiation and chaotic politics," said Satoshi Nisaka, who does car inspections at a Toy-

ota dealership. When the quake struck, Nisaka was going over documents at his office in the coastal town of Haramachi, about 25 kilometers north of the nuclear plant. Like most residents, he didn't anticipate the scale of the tsunami, but wisely went to higher ground. From there he saw a retirement home being washed away and the shoreline, normally blocked from view by houses and pine trees which had all been pummeled by the waters. Throughout the chaos of the first few days, Nisaka, an amateur ham radio operator, kept himself informed by listening in on the fire department's communications.

Nisaka had taken the government's long-standing predictions of major seismic activity in his region seriously. At home he stored plenty of fuel and kept a forklift on hand. Right after the quake he set up a computer network from where he sent out video footage of the area. Like many residents, Nisaka sneaked back into his home after it was designated off limits as part of the dangerously contaminated hot zone. But unlike the majority of people who grabbed a few crucial papers and whatever else they could carry by hand, Nisaka's advance planning allowed him to haul out on a truck his washing machine, refrigerator, TV, futons, books and a computer.

Nisaka feels he did the best he could in dealing with the disaster. He is disappointed that Japan's leaders have not. "A politician's role is to take action and give us dreams. I don't see any faces of politicians here," he said, explaining that no official has presented clear explanations on questions ranging from what happens to his bank loans to the dangers of the radiation. Nisaka wants to see support from other prominent people, too. "What happened to the lawyers' groups?" he asked, referring to the rights-championing attorneys that often band together to support the accused in high-profile criminal cases. He even feels let down that he hasn't heard from the nature conservation groups that in more peaceful times showed up to urge protection of the dragonflies that inhabit the area's rice paddies.

That perception of a dearth of leadership has been felt throughout Japan. Immediately after the quake, nearly all of the official information – made up largely of claims that things were under investigation – came from the government spokesman Yukio Edano and not the prime minister. Meanwhile Tokyo's high-profile governor, Shintaro Ishihara, exacerbated nerves by referring to the calamity as "divine punishment" for selfish behavior. A

popular tweet at the time said, "Edano go to sleep, Kan wake up, Ishihara shut up." Kan began appointing disaster-relief panels whose number swelled to more than 20, giving the impression that the creation of committees was more of a tactic to diffuse responsibility than a means for concrete action.

Official announcements on the hazards of radiation, too technical for most people to understand to begin with, were initially sporadic and confusing. "The government kept saying, 'There is no immediate physical danger,' but does that mean physical danger is coming later? When?" asked Kazuyuki Yamada, from the town of Namie, about eight kilometers from the reactors. "I'd never heard of millisieverts or becquerels before," he said, referring to the units of measurement of radiation. "I don't think I wanted to know so much about them."

It didn't help that in late April, a university professor appointed by the prime minister as a special adviser on nuclear matters abruptly resigned, charging that the leadership was "haphazard" in its decision-making and pointing out that the government-set ceiling for radiation levels allowed in Fukushima schoolyards was too high. "If I were asked whether I would put my children in such a situation, I would definitely not want to," said the tearful Toshiso Kosako in a press conference. Kosako's remonstrations left Fukushima residents even more puzzled as to whether they should let their children play outside during recess.

The absence of pertinent information is partly due to the lack of consensus here on how much data should be made available to the public. Japanese leaders have traditionally operated on a need-to-know basis, arguing that specialized information can be wrongfully interpreted and cause confusion and panic. For example, the government did not release on a regular basis its calculations of the amount of radiation in the air until six weeks after the reactors started spewing toxic materials. Those estimates would have been useful for the public in planning evacuations and in stemming the rush across cyberspace of false and frightening rumors.

Japan's mainstream press also errs on the side of caution when it comes to publishing sensitive information. The weekly magazine *AERA* strayed from the pack right after the quake and put a photo of a man wearing a full-face mask on its cover with the caption "Radiation is coming." Even though the line turned out to be correct, readers barraged the magazine with criticism

of sensationalism, pressuring the editor to issue an apology.

For Takayoshi Watanabe, the sense of Fukushima's isolation was felt in the month that rescue work was stopped in the prefecture's wrecked coastal areas near the power plant. The day after the quake, Watanabe and his colleagues of the volunteer fire brigade were smoking cigarettes and trading banter as they took a break from their recovery efforts within view of the reactors. Their lighthearted exchanges helped mask their fears, the 31-year-old auto mechanic explained. "We were all going a bit crazy," Watanabe said. "We weren't used to so many dead bodies. We have normal jobs."

Just after 3:30 p.m., they heard a blunted but resounding explosive sound. "We all expected to see a mushroom cloud, but there wasn't one," Watanabe recalled. It was the blast of a hydrogen explosion at one of the six reactors. Everyone, including the workers, was ordered to leave the area immediately. Rescue operations didn't resume for six weeks, and by that time they were effectively for the retrieval of bodies. Among them was Watanabe's cousin who had also been working as a firefighter. "He had been abandoned for a month," Watanabe said bitterly.

The closing off of areas with high radiation readings, while understandable, has been torturous for residents who when evacuated were given the impression that they could return very soon. Every day, they have watched the TV coverage of people in the other regions picking through debris to recover photo albums and other mementos. In mid-May, the government started a long-awaited program to let residents of the restricted areas go to their houses, but the visits are strictly limited. Participants are bused in for a two-hour period and can only take out belongings that fit into a designated 70-centimeter-by-70-centimeter plastic bag.

Kazuyuki Yamada had evacuated with no particular possessions and was still wearing his volunteer firefighting outfit of a happi coat and galoshes when he left. His supervisor had suggested that the evacuation was just a precaution. Yamada noted with irony that he has a Tokyo Electric Power Co. calendar at home that instructs residents on emergency procedures in the case of an accident at its reactors. "It says things like, 'Let's board a bus,' and 'Let's drink iodide,' but doesn't offer any details," he said.

On April 12, Yamada snuck back into Namie to check on his home and apartment. He donned two ponchos and a gauze mask. A policeman

stopped him at a 30-kilometer perimeter checkpoint, but when Yamada explained that he just wanted to retrieve his bank documents, the officer told him, "Go get them and leave immediately." He drove into his deserted village that eerily had some working traffic lights.

As soon as Yamada emerged from the hot zone, he changed his clothes and sealed the items he had worn into a bag. He stopped at a local government screening center and confirmed that he did not register any high radiation readings. He also washed his car.

Even with such precautions, Yamada might have gotten the pariah treatment. *Fuhyo higai* (damage from rumors) is a term frequently in the news these days. The phrase refers mostly to financial losses from the decline in sales of products that are regarded, often mistakenly, as tainted with radiation. But the negative perceptions have spiraled hysterically out of control in some cases. Seiichi Nogami, a car salesman from Namie, says he now gets requests from local residents for cars with out-of-prefecture plates. Clients have told him about restaurants and shops from other areas that refused to let in autos from Fukushima. "Of course the rest of the world might be viewing all of Japan this way," he says, referring to reports that Japanese exports were being checked for radiation levels at ports of entry.

The most heart-wrenching tales of *fuhyo* may be those that affect children, such as the cases of evacuees being taunted at their new schools as being irradiated. Schoolteacher Tomoyuki Watanabe noted that even some local children have skewed views of the effects of radiation. He recalled that when one of his students noticed three strands of her hair had come out, she wondered if that had been caused by radiation. "It is these kids that will build the future here," he said. "I don't want them to think their bodies are worthless from radiation or that they can never live here again. I want them to work for their hometown."

That is a tall order for the traumatized children to think of fulfilling right away, but many local adults have never thought otherwise. Shuro Sato, who heads a major Toyota dealership in Koriyama, has continued to come to work every day since the quake. The three-story office building is notably different from before. In one corner of the first-floor sales area sits a vending-machine-sized appliance that removes radioactive isotopes from water. Five construction workers are hammering away to replace the col-

lapsed ceilings on the second floor. A bronze bust of Toyota Motor founder Kiichiro Toyoda sits in a hallway, but it is missing its metallic glasses, which flew off and broke in the quake.

"Fukushima is in a crisis," said Sato. "But I have my company to worry about." A bulletin board in his office displays the photo-bearing name cards of every single one of his 550 employees. Although some lost family members, all of the workers managed to survive.

While I toured Sato's office building, a wagtail flew up from the planters lining the third-floor windows that look down into a courtyard. Although more than half of the window boxes had been knocked to the ground, the wagtail was building a nest in one of the flower beds, just as it had done every year before.

Kumiko Makihara is a freelance writer and translator based in Tokyo.

CHAPTER 2
Japan's Quakes, Past and Future



IWATE ON JUNE 12 (PHOTO BY KIYOSHI OTA/GETTY IMAGES)

"We forget that the sea is close because we build next to it. Then the tsunami comes and washes away the houses and you can see the sea again. And we're reminded."

—Ofunato resident

Remembering the Future
by David McNeill

Building on Fault Lines
by Gregory Smits

REMEMBERING THE FUTURE

BY DAVID MCNEILL

In one of the more heartbreaking early dispatches from Japan's coastal northeast, fleeing refugees from Minamisanriku impotently watch from a high point as a huge muddy wave slowly swallows up their town. Voices behind the shaky handheld camera record the emotions of the crowd, from initial incredulity to horror, then keening despair. Old and young, male and female, weep. An elderly man, possibly the camera operator, keeps repeating "*tomete kure, tomete kure*" (stop it, please stop it). Afterwards, they were surely thankful to have survived. But in the moment captured on film, the overwhelming reaction was disbelief and for some, perhaps, déjà vu.

Journalists heard those sentiments expressed repeatedly after they descended on Tohoku in the days and weeks afterwards. "We thought we were safe," said Kenji Nakajima, a fisherman in the sleepy fishing village of Sakihama, Iwate prefecture. "I couldn't believe it when I saw the water coming over the barrier." Nakajima and the other villagers sheltered for decades behind a 10-meter reinforced concrete wall built in front of the sea after a tsunami raced across the Pacific from Chile in 1960, killing 142 people along the Sanriku coast. The wall of water that inundated his village was twice that high, he says. He and his wife, Yuki, then argued about whether to build on the same spot or move inland at greater cost. "We can't rebuild here," said Yuki, as her husband kicked at the ground and the now ruined tsunami wall loomed in the background. "In 50 or 60 years the waves will come back. We'll be dead, but what about our children?"

In Ofunato, Akio Komukai recalled speeding away from the coast on March 11 after the earthquake struck and meeting children on their way

home from school. "They were walking toward the sea and I rolled down the window of my car and shouted: '*Tsunami tendenko!*' 'There's a tsunami coming, you need to run away!' " The young people looked at the 61-year-old Cassandra, said '*hai, hai*' and kept walking, an episode one imagines being repeated down through the centuries. Tsunami warnings are as common as muck in the city — there had been one a few days earlier. The city's history records a 38-meter wave in 1896. Komukai, who remembers the 1960 tsunami washing away houses, still wonders who among the children survived. "They didn't believe me," he said. "We forget that the sea is close because we build next to it. Then the tsunami comes and washes away the houses and you can see the sea again. And we're reminded."

Memory and forgetting were life-or-death issues for the northeast coast. The Oikawa family in Ofunato lost their house to the sea but the family of five, including 12-year-old Natsuko, 10-year-old Hinako and eight-year-old Masatsugu, remembered the stories of tsunamis from their grandmother and ran toward the mountain, away from the sea. One of the few villages to emerge largely unscathed was Fudai in Iwate prefecture, which shields behind a 15.5-meter seawall and a huge, 205-meter floodgate built at the astronomical cost of Y3.5 billion. Considered a classic rural boondoggle at the time, the man who pushed it through, late mayor Kotaku Wamura, is now considered a local hero, driven it seems not by the grubby imperatives of Japan's voracious construction lobby but by the searing memory of the 1933 tsunami that pulverized the northeast. "When I saw bodies being dug up from the piles of earth, I did not know what to say," Wamura wrote in his biography of the disaster he witnessed and the lessons he learned when in his twenties.

In every area, the old are trying to bring the past back to life. "It was worse than World War II because then we knew what to expect," said Komukai's 88-year-old mother, Atsu. "This happened so suddenly: The earthquake and tsunami came, the electricity, water, gas everything went and we were left alone." In the village of Omaezeki, Shizuoka prefecture, 90-year-old Eichi Nagano, who remembers waving off Japan's legendary doomed *Yamato* battleship as a sailor during the war, has been warning for four decades about the five-reactor nuclear complex called Hamaoka. His tour of the plant outskirts, given to hundreds of people over the years, is the product of distilled

knowledge, delivered in the measured tones of an academic, without a hint of senility, and it ends with a small rock from his pocket. "The government and Chubu Electric was in such a hurry to build [in the 1970s] that they didn't check the foundations," he says, crumbling the rock in his hand. "The rock was here long before them."

Nagano bristles that Chubu Electric, the Ministry of Economy Trade and Industry, the Nuclear Industry Safety Agency, and the government officials 200 kilometers away in Tokyo have forgotten, or chosen not to remember, the quakes and tsunamis that have battered this coast for millennia. Until March 11, 2011, perhaps the most powerful seismic event Japan had experienced was the 1707 Hoei quake, which triggered a tsunami that washed through much of Shizuoka. He could barely believe it when he heard Masataka Shimizu, president of Tokyo Electric Power Co. (TEPCO), tell Japan that the tsunami that stuck the Fukushima Daiichi nuclear plant was "beyond our expectations." Shimizu is 66. Perhaps his father or grandfather remembers the 28-meter waves that demolished Aomori, Iwate and Miyagi in 1933. As the boss of Japan's largest nuclear power company, responsible for 17 reactors and the world's biggest nuclear complex, couldn't he have studied his history to learn about the "unprecedented" 38-meter wave that crashed ashore in 1896?

Inside the Fukushima plant, insulated by some of the world's most sophisticated technology, the past seemed especially far away on March 11. "We had no idea that a tsunami was coming," said Yasuki Murata, head of public relations for the now ruined facility, seemingly oblivious to the ghosts rattling around in that extraordinary statement. "It came completely out of the blue" (*nemimi ni mizu datta*). Engineers and graduates from Japan's top science universities, the Tokyo Institute of Technology and the University of Tokyo, their corporate and bureaucratic bosses, studied history in school like every other Japanese, then brought plutonium, a substance so toxic that a teaspoon-sized cube of it would suffice to kill 10 million people, to this complex. Diesel-powered generators, shielded behind walls barely tall enough to withstand a medium-sized wave, stood between it and catastrophe, which duly arrived at 2:46 p.m. on March 11.

Shimizu, Tepco, Chubu and others are now again trying to remember. Hamaoka, which was engineered to withstand only an 8.5-magnitude

quake and an 8-meter tsunami, has been temporarily closed, following an unexpected directive from Prime Minister Naoto Kan. TEPCO has moved its emergency generators and diesel supply at the Fukushima plant to higher ground and is digging a 500-meter dike, including 10-meter-high concrete barriers between the coast and the No. 3 and No. 4 reactors. Japan's utilities have been ordered to strengthen power lines and protect backup generators from tsunamis. Across the country, an army of technicians has been mobilized to re-study the explosive collision of state-of-the-art atomic power with primordial seismic instability.

The ripples from Japan's disaster are slowly making their way across the Pacific Plate: the so-called ring of fire, home to most of the world's earthquakes and many of its nuclear plants. Taiwan has commissioned experts from the National Central University to model worst-case scenarios for the island's three nuclear plants (a fourth is under construction). Tsunami expert Tso-Ren Wu, who is based at the university, warns that Taiwan is due a strong quake on the Manila Trench. Regulators in the United States have begun reviewing safety at all 104 reactors, but the confidence of the industry remains undiminished. "The United States has an effective, multifaceted regulatory regime that has already addressed many of the mistakes and weaknesses that Fukushima seems to have exposed, including earthquake and tsunami preparedness," said the Heritage Foundation in May.

Can America afford to be so blithe? Two of its western-seaboard plants, San Onofre and Diablo Canyon, are designed to withstand a maximum magnitude-7.5 quake and 25-feet tsunamis. Southern California is not known for big tsunamis. But the Pacific Northwest coast and Canada have been struck by M9-class seismic events roughly every 500 years, says Gregory Smits, an associate professor of history at Pennsylvania State University. "Outside of Native American lore, however, today's Pacific Northwest possesses no collective memory of disastrous seismic events and is in many other ways less prepared for the possibility of a disaster than its cross-plate neighbors in the Tohoku region of Japan," he says.

Why do coastal areas with millennia of collective memories forget such painful lessons? Smits cites several contributing factors to this sometimes fatal lack of historical memory: attachment to ancestral land, urbanization and the shifting of traditional communities, the influx of new people with

no knowledge of tsunamis, and the convenience of low-lying areas for the fishing industry. It's as if, he says, the sense of danger "diminishes after the passing of each tsunami-free decade." Each generation builds stone monuments at the highest point of the tsunami that struck their homes, then forgets their lessons, their faded stone lettering a metaphor for collective amnesia.

Kenji Nakajima and his wife will argue about the next tsunami and, if the insurance pays and they can find land, shift their house a few hundred meters away from the shore and up the Kitasato mountain where their children will be safer. By the time the next tsunami hits Ofunato city, 61-year-old Komukai-san will surely have passed away, and the children he shouted at will have their own painful memories of the 2011 Great East Japan Earthquake and tsunami. The name Masataka Shimizu will long have been forgotten. Most of the towns and villages will have been rebuilt. But what of the 54 nuclear reactors dotted all around the coastline? Will they have been replaced by windmills or solar power, or some unimaginable new technology? Or will there be another Fukushima, or worse? "Maybe it won't come to that," wrote Irish journalist Eamonn McCann in March. "But then, we were assured it wouldn't come to this." As Fukushima's fires still smoldered, Hidehiko Nishiyama, deputy director general of Japan's Nuclear and Industrial Safety Agency, told the BBC that "Nuclear power is indispensible for Japan's economic development." "We need to strengthen the safety of our nuclear plants," he said, not adding, though he might as well: So we just need to move on.

"The struggle of man against power is the struggle of memory against forgetting," Czech writer Milan Kundera once wrote. How will March 11, 2011, be remembered?

David McNeill is the Chronicle of Higher Education*'s Japan/South Korea correspondent.*

BUILDING ON FAULT LINES

BY GREGORY SMITS

The March 11, 2011, Tohoku Earthquake and the tsunami it generated was a classic case of natural hazards such as severe ground motion and seismic sea waves coming into contact with human society to produce a multi-dimensional natural disaster. Throughout Japanese history, writers often initially referred to such events as "unprecedented." As time passed, other commentators would point out that in fact such events were "normal" in that they occurred repeatedly in the past. Similarly, this paper seeks to provide historical context for the recent disaster in two broad senses. First, I examine the earthquake and tsunami as part of a long, ongoing sequence of geological events. Then I focus on the human reaction to earthquake-tsunami combinations similar to those of 2011, with particular attention to events that took place in the modern era.

Tsunamigenic earthquakes originating near the Japan Trench have occurred periodically. The edge of the Pacific Plate subductuing under a portion of the North American Plate — sometimes called the Okhotsk Plate — creates the Japan Trench. Strong earthquakes originating in this offshore region typically generate sequences of seismic sea waves called tsunamis. Tsunamigenic earthquakes originating near the Japan Trench usually, but not always, cause severe ground motion, as was the case on March 11, 2011. This magnitude-9 earthquake is the strongest known earthquake to have shaken any part of Japan, and tsunami heights approached 38 meters in some areas. In the absence of knowledge of the seismological history of the Tohoku region and adjacent offshore areas, the recent disaster may appear unprecedented. Instead, however, it was a recurrence of past seismic events.

Waves as high as 38 meters demolished precisely the same coastal areas in 1896, and waves as high as 28 meters caused vast destruction along the Sanriku coast (Pacific-coast areas of Aomori, Iwate and Miyagi prefectures) in 1933.

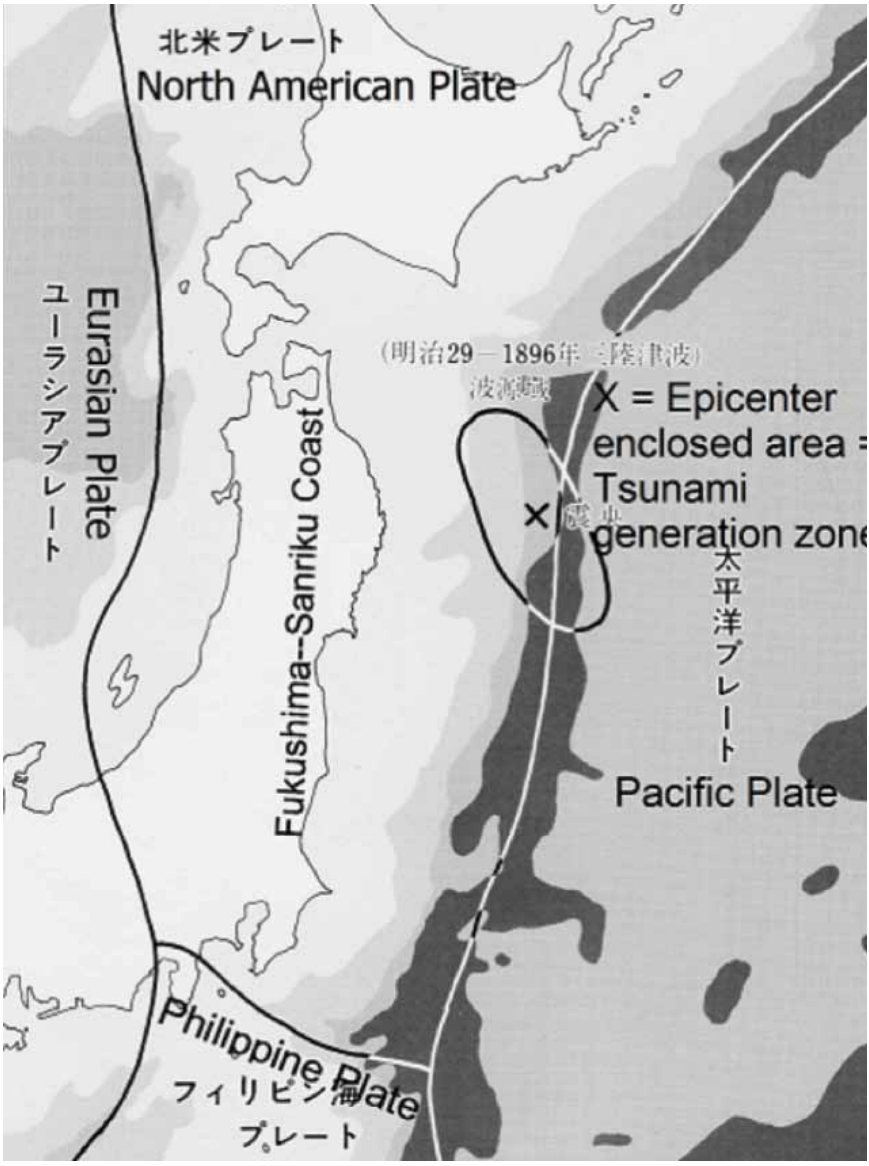
This paper examines past tsunamigenic earthquakes striking the Sanriku coast as context for the March 11, 2011 disaster. For added perspective on the importance of historical memory, I discuss a tsunami disaster in Osaka in 1854 in connection with the Ansei Nankai Earthquake. A close examination of reactions to the 1896 Meiji Sanriku Earthquake and the 1933 (Showa) Sanriku Earthquake suggests that fundamental changes in regional patterns of settlement and building would mitigate any future disaster. If the past is any guide to the future, however, it is unlikely that in the longer term people will avoid dwelling in tsunami-prone areas.

Geographical and Geological Considerations

The Tohoku region is subject to shaking from fault ruptures in four types of locations: ocean trench earthquakes off the Sanriku or Fukushima coast; intra-plate earthquakes originating under northern Honshu or the Pacific; shallow-focus inland earthquakes; and intra-plate earthquakes originating under the Sea of Japan. Three of these four types of earthquakes often generate tsunamis.[1] Along the Sanriku coast, the geographical interface between human settlements and the sea has often amplified the destructive power of tsunami waves. The coastline is deeply indented, and many of its bays and inlets are shaped roughly like a bugle whose bell end opens to the ocean. Fishing villages have been located at the narrow interiors of these bays at the precise point where tsunami wave height would be highest because of a fixed quantity of water being forced into an increasingly narrow, shallow area.[2]

See Map 1 for reference.

One important phenomenon that occurs in perhaps 10 percent of seismic events in the Tohoku region is that an earthquake causing only mild ground motion produces a large, destructive tsunami. These dangerous events are known as "tsunami earthquakes," a term coined in 1972 by Hiroo Kanamori of the California Institute of Technology. The destructive Keicho



Map 1. The Tohoku region, nearby tectonic plates and the locus of the 1896 earthquake and tsunami. Adapted from *Yamashita Fumio, Shashin to e de miru Meiji Sanriku otsunami* (1995), p. 16.

Tsunami of 1611 and the Meiji Sanriku Earthquake and tsunami of 1896 are two examples of the earth shaking so mildly that people did not expect the massive tsunamis that followed. Kanamori has identified six causal factors for tsunami earthquakes. The two especially relevant to the Meiji Sanriku quake are that the fault rupture takes place slowly and that the rupture breaks and displaces accumulated sediments at the plate boundary. The presence of these sediments can function to slow the speed of the fault rupture. Moreover, the movement of large quantities of sediments can displace water and contribute to the size of the tsunami. It is possible to calculate the magnitude of a tsunami using tide gauges to measure the total width and distance between the epicenter of the earthquake and points on shore the tsunami reaches. Ordinarily, tsunami magnitudes closely track the magnitudes of the earthquakes that generate them, but a tsunami earthquake can be defined as an event in which the tsunami magnitude is significantly higher than the earthquake magnitude.[3]

See Map 2 for reference.

If the sea floor moves too slowly as a fault ruptures, there will be no tsunami. Within the range of speed necessary to generate a tsunami, an increase in rupture time will decrease the magnitude and intensity of shaking, but it will not decrease the size of the tsunami. As a rough rule, tsunamis tend to occur from rupture speeds ranging from several tens of seconds to about 100 seconds. In the case of the Meiji Sanriku earthquake, the best estimate is that a portion of the fault about 250 kilometers long ruptured over the course of about 100 seconds. The resulting seismic land waves would have had such a long period that people would barely have felt them. The relatively slow fault rupture pushed unconsolidated sediments upward to produce a massive tsunami. In this case, the earthquake magnitude was roughly 7.2, but the tsunami magnitude was 8.6.[4]

The 2011 Tohoku earthquake was not a tsunami earthquake. Ground motion was severe, which ideally should have prompted an immediate flight to high ground for those capable of doing so. Initial reports indicate high survival rates in localities that heeded the warning that the shaking provided.[5] The maximum height of the tsunami was roughly the same in 2011 as it was in 1896, approximately 38 meters at the village of Ryori in Iwate prefecture (today, Ofunato-shi, Sanriku-cho, Ryori).[6]



MAP 2. Tsumani heights at coastal locations in 1896 and local fatalities. Adapted from Yamashita Fumio, Shashin to e de miru Meiji Sanriku otsunami (1995), p. 30.

Overall History

The Sanriku coast and nearby areas in the Tohoku region have a long history of large earthquakes and tsunamis. At night, on July 13, 869 (Jokan 11, 5m, 26d), an earthquake with an estimated magnitude of 8.3 shook the area, and the tsunami tore through Taga Castle, drowning approximately 1,000 according to *Nihon sandai jitsuroku* (veritable records of the three reigns of Japan). Considering the relatively sparse population at the time, 1,000 deaths was a major human disaster. Geologists have recently discovered a sand layer in the Sendai Plain dating to the time of this event.[7]

In the early afternoon of December 2, 1611 (Keicho 16, 10m, 28d), very mild shaking that many did not feel was the only harbinger of a massive tsunami that struck around 2 p.m. Precise written records indicate the extent to which the series of three waves penetrated inland, farther even than occurred as a result of the Meiji Sanriku quake. The Keicho tsunami death toll approached 3,000 in the Sanriku area and over 3,000 in the Nanbu-Tsugaru area. Considering that the population at the time was one-quarter what it was during most of the Showa era, the human disaster was roughly on a par with the events of 1896 or 2011. There was no loss of life or significant damage from the shaking, and this lack of warning surely added to the death toll.[8]In a study of the Keicho event, Hirakawa Arata of Tohoku University has recently concluded that massive tsunamis have flooded the Sendai Plain every few centuries. Moreover, the stops along the Tokugawa-period coastal highway corresponded to areas just beyond the reach of the water from the 1611 tsunami. Hirakawa claims that in the midst of post-Meiji development modern people in the region have lost their acute sense of tsunami danger.[9]

One item of lore developed in connection with the 1611 tsunami sheds light on a broader trend in Japanese earthquake-related culture. The previous year, there had been reports of fishermen catching giant-sized *ayu* (sweetfish) and sardines in the area. In hindsight, this apparent ecological anomaly seemed significant to many local residents as a precursor to the tsunami.[10] Throughout Japan's premodern and modern history, there has been a tendency to suppose links between earthquakes and the behavior of fish or other marine life. An April 1, 1932, *Yomiuri Shimbun* article, for

example, announced that Tohoku University professor Hatai Shinkishi had demonstrated that when catfish swim in a certain way, an earthquake occurs within 12 hours. The fish in Hatai's lab had allegedly predicted almost 100 earthquakes.[11] The media excitement over Hatai's research soon faded. Despite much research attention during the 20th century, nobody has developed any useful way to employ fish or other animals as earthquake predictors. Such interest continues to this day. Reminiscent of the ayu and sardines in 1610, a recent newspaper article explained that the squid catch was unusually high prior to several earthquakes between 1946 and 2011, implying some kind of link.[12]

Reports of unusually bountiful fish catches appeared in connection with an earthquake and tsunami that struck the Sanriku coast late in the morning of February 17, 1793. The earthquake damage was moderate, and only 12 people died in the shaking, but many more died in the tsunami that struck around 10 a.m. Because the 1611 disaster and the one in 1793 occurred in the winter, a local folk theory developed such that tsunamis only strike when leaves are not on the trees. This notion was part of popular lore in August 23, 1856, when a strong offshore earthquake shook the Sanriku area. Because the trees were full of leaves, some people delayed making their way to high ground and were caught by the four tsunami waves that soon came sweeping through coastal areas.[13] In this case, historical memory contributed to an inaccurate and potentially deadly folk theory. More generally, it has long been customary in Japan to assume links between atmospheric phenomena and earthquakes or tsunamis, and seismologists searched for such links well into the 20th century. The gradual acceptance of plate tectonics by Japan's scientific community during the 1970s put an end to lingering seismological interest in the role of atmospheric phenomena and earthquakes.

The June 15, 1896, Meiji Sanriku earthquake occurred at 7:32 p.m. on the fifth day of the fifth month in the old lunar calendar. Villages in the area had been celebrating the Boys' Festival, and military organizations were celebrating Japan's recent victory over China. Gentle ground motion and the absence of seawalls exacerbated the disaster. The tsunami struck about 35 minutes after the earthquake. Three main waves of the tsunami swept over the landscape, and many villages lost the majority of their inhabitants. The

total death toll was 21,959, more than 10,000 structures were washed away, and more than 7,000 boats and ships were destroyed or damaged.[14] At 2:31 in the morning of March 2, 1933, the magnitude-8.1 Sanriku Earthquake (sometimes called the Showa Sanriku Earthquake) shook residents awake. Originating near the location of the 1896 event, the 1933 earthquake was the result of the rupture of an intra-plate fault. Although geologically different from its 1896 predecessor, the 1933 earthquake was functionally similar in that it threw off a large tsunami. The maximum wave height at Ryori Bay was 28.7 meters. The Sanriku quake and tsunami resulted in slightly more than 3,000 deaths and more than 1,000 injuries. The shaking, waves and fire combined destroyed more than 6,000 houses, and local residents endured 77 aftershocks of magnitude 6 or higher for six months following the main shock.[15]

It should be clear from this overview that large tsunamigenic earthquakes have occurred repeatedly in precisely the areas devastated by the March 11, 2011 event. Writing in approximately 2006, Okada Yoshimitsu pointed out that:

In the Tohoku region, there is a stronger tendency for large earthquakes and the tsunamis that accompany them to occur offshore, owing to plate subduction. In the years to come, there is an extremely high likelihood of a large earthquake originating beneath the sea floor along the Japan Trench. [16]

Moreover, hazard maps in the front matter of Okada's book list the area offshore from Sendai as having a 99 percent chance of experiencing a magnitude 7.5 or greater earthquake during the next 30 years. The earthquake and tsunami of March 11, 2011, was the event which Okada anticipated, reflecting a broad consensus of the seismological community. In this sense, the earthquake was an expected event, at least among a small group of experts.

I should emphasize that current knowledge and technology is unable to predict earthquakes with any degree of precision that would be of practical use in, for example, allowing for orderly evacuations of dangerous areas. To say that the recent earthquake was an expected event means that knowledge of the relevant geological mechanisms and historical experience indicated that moderately large tsunamis are likely to occur in the area every few de-

cades, and extremely large and destructive events are likely to occur every few centuries. With this knowledge in mind, it would probably be prudent to build critical, and potentially dangerous, infrastructure such as nuclear power plants in light of worst-case scenarios to withstand M9-class shaking and tsunami heights on a par with those of 1896 or 2011, plus an additional safety margin.[17] The 2011 event did moderately exceed expectations in terms of the sheer quantity of energy released by the earthquake (magnitude), but the 1896 event still holds the record for tsunami height, if only by an insignificant few centimeters. Had people heeded the warnings on still-extant stone monuments from 1896 not to build below the point of the monument, their houses would have been safe from the recent tsunami.[18]

The case of Osaka

Before taking a closer look at the Tohoku situation, the case of Osaka provides useful comparison. Two massive tsunamigenic earthquakes shook Osaka and large areas along the coast in 1707 and 1854. Until March 11, 2011, many historical seismologists regarded the 1707 Hoei Earthquake as the most powerful known earthquake to have shaken Japan. It generated tsunami waves that washed through the coast of Honshu from Suruga Bay southward, through much of Shikoku, and parts of northern Kyushu. Like Hoei, the December 24, 1854, Ansei Nankai Earthquake (M8.4) was an offshore subduction-zone earthquake that generated a destructive tsunami. Both the Hoei and Ansei Nankai earthquakes were geologically similar to the 2011 Tohoku quake.

The Hoei earthquake and tsunami caused coastal villages to develop evacuation plans that usually involved the entire community assembling at a temple, shrine, or other suitable location on high ground. Anticipating the need occasionally to spend a night or two at such locations, some villages constructed simple shelters at the evacuation area. Throughout the area within range of the 1707 tsunami, generations of rural coastal residents fled to high ground when the earth shook. Sometimes the move proved unnecessary, but the Hoei devastation loomed large in historical memory. A writer living in the Kii Peninsula, for example, explained that "fearing a tsunami, people set up lean-to shelters in the mountains," and letters, di-

ary entries and other documents dealing with rural areas regularly describe lowland villages in terms such as these: "Owing to tsunamis, everyone had set up huts in the mountains, and not a single person was dwelling" in the lowland village. [19] Not all accounts, however speak of an effective response. "There is a saying that complacency is the greatest enemy (*yudantaiteki*)," began a short essay that went on to criticize people of the present for ignoring the lessons of the 1707 Hoei earthquake and tsunami "as if it were an ancient tale" and not currently relevant knowledge.[20] The writer was referring to Osaka.

Although the Hoei tsunami damaged Osaka, between 1707 and 1854 there had been a substantial turnover in the city's population, including an influx of people from inland areas. Historical memory of the type needed to preserve effective tsunami evacuation practices was weak or absent. As early as the 1662 Kanbun Earthquake, many residents of Osaka fled to boats moored in the city's rivers and remained there for several days or even weeks to escape the nerve-racking shaking from aftershocks that usually followed major earthquakes. An order by Osaka's Machibugyo in 1854 prohibiting onboard drinking parties clearly indicates that the city authorities regarded fleeing to boats as a perfectly viable option, provided people remain sober.[21] Inland earthquakes such as Kanbun were more common than offshore tsunamigenic events, and by 1854, the Hoei quake would indeed have seemed like "an ancient tale" to the few people in Osaka who even knew about it. Much more relevant would have been the magnitude-7.25 Iga-Ueno Earthquake of July 9, 1854, approximately six months prior to Ansei Nankai. As many people as possible rode out the many Iga-Ueno aftershocks in the relative comfort of boats in the rivers. Moreover, the Ansei Tokai earthquake on December 23 caused some shaking in Osaka but no tsunami. The result of the mass flight to boats the next day was tragic and dramatic. The massive tsunami waves that swept up the rivers crushed nearly all of the boats, resulting in perhaps 800 deaths.[22]

The case of Osaka in 1854 serves as a preview. Some of the basic conditions of modern life such as the relatively easy movement of people and a weakening of traditions in local communities contributed to the fatal lack of historical memory. Similar forces have been at work in the Tohoku region and elsewhere since the 1890s.

A CLOSER LOOK AT 1896 AND 1933

Returning to the Tohoku region, I examine the tsunamis of 1896 and 1933 in detail, particularly the short-term and longer-term responses to these events. The scope of the disaster in 1896 was overwhelming at first. Without warning, mud and sand buried about 70 coastal communities, bodies mixing in with debris from smashed houses. In Iwate prefecture, where about 20,000 died, 125 women died for every 100 men. The main reason was that men often set out in the evening for night fishing. In one village, for example, about 40 fishermen in five or six boats went out the evening of the tsunami. At sea, they experienced nothing unusual and were shocked to see their demolished village as they approached shore. Many such returning fishermen heard voices calling out for help in the dark as they returned. Local lore regarded voices in the water as those of ghosts. Moreover, answering the calls of such ghosts would result in their pulling the responder into the water. This situation resulted in delays in the fishermen mounting rescue operations.[23]

In the hardest-hit villages, the tsunami killed the majority of residents. Taro Village, for example, lost 83 percent of its residents.

Only 36 of its population of 2,000 survived. The waves washed away all public infrastructure plus 285 of 336 houses, and because the village faced the Pacific Ocean directly, the water swept most bodies out to sea. In the days following the tsunami, a large number of these bodies washed up on shore.[24] Owing to warm summer conditions, a lack of people and a lack of infrastructure, disposal and identification of the many bodies was a major problem. Sometimes debris became a funeral pyre for unclaimed bodies. Hirota Village used fishing nets to recover bodies at sea. As many as 50 came up in one sweep, so many that only half could be brought to shore at a time.

Bodies in the ocean soon became encrusted with sea creatures, and starving dogs set upon corpses on land, sometimes biting people who tried to restrain them. Bodies from one village often floated to other areas, further complicating identification. In Iwate prefecture, 10,200 of the 18,158 bodies recovered were disposed of in mass graves.[25] This gruesome aftermath would have made a strong impression on survivors and people entering the

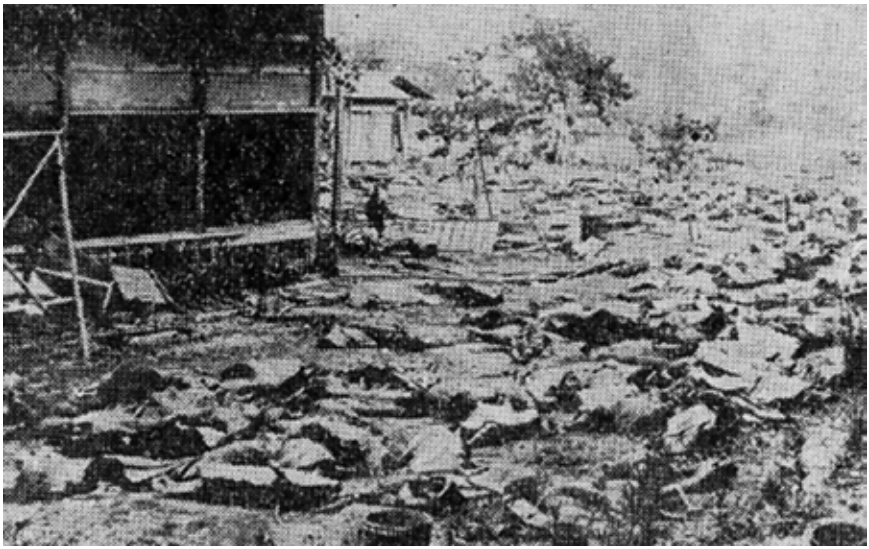


Figure 1. Bodies line the ground outside a local temple in Kama'ishi, 1896. From *Yamashita Fumio, Shashin to e de miru Meiji Sanriku otsunami* (1995), p. 20.



Figure 2. Drawing of the recovery of bodies at Hirota, 1896. From *Yamashita Fumio, Shashin to e de miru Meiji Sanriku otsunami* (1995), p. 21.

area.

The total cost of the 1896 disaster was between Y7.1 million and Y8.7 million, approximately 10 percent of the national budget for that year. The total cost of the 1995 Kobe Earthquake was also just over 10 percent of the national budget, so the financial impact of both events was roughly comparable.[26]

Hattori Kazumi, governor of Iwate prefecture, issued general instructions published on June 20 in the local newspaper, the *Iwate koho*:

The present tsunami that struck 60 ri off the Tohoku coast is an unprecedented (*zendai-mimon*) catastrophe, and it is essential to be alert to maintain hygiene in the affected areas to the best of our ability. Especially after a disaster, fearsome outbreaks of epidemic and contagious disease occur. … It is especially necessary for us to attend to steps such as setting up evacuation centers, treating the wounded and sick, properly disposing of corpses, potable water, and cleaning up the debris widely strewn about the disaster area.[27]

This concern with "hygiene" (*eisei*) appears frequently in documents related to this earthquake, and it was typical of the times.[28] Governor Hattori's general directive became a detailed set of instructions for cleansing, burning, disinfecting, and taking other measures thought to prevent the spread of disease. For example, "Periodically open the windows and light a fire to maintain dryness in houses. In particular, this should be done before sleeping."[29]

Other steps in dealing with the immediate aftermath of the tsunami included dispatching medical personnel and gangs of laborers to the area, measures to control theft and looting (sometimes at the hands of the gangs of laborers), and attempts to control hoarding and price gouging. In one case, the police investigated a rice dealer in Miyako-cho claiming his shelves were empty and found that he had enough rice in stock for 20 days. They lectured him on the evils of price gouging during this unprecedented (*mizo*) emergency and forced him to sell his stock at a moderate price.[30] Although the details were different in 1896, the general problem of hoarding necessities appeared in 2011, even in areas not directly affected by the disaster.

The central government dispatched specialists to the disaster area, and



Figure 3. The seawall at Taro, sometimes called "The Great Wall" by local residents. From *Yamashita Fumio, Shashin to e de miru Meiji Sanriku otsunami* (1995), p. 41.



Figure 4. Taro in the wake of the March 11, 2011, disaster. The great seawall was not tall enough to hold back the tsunami.

interior minister Itagaki Taisuke left Tokyo for a tour of the region on June 22. Each of the affected prefectures established relief centers. Miyagi prefecture, for example, created the Temporary Tsunami Bureau (*Kaisho rinjibu*). It operated for 67 days from June 20 to August 25. People from Iwate, Miyagi and Aomori prefectures living in Tokyo established an agency to coordinate the solicitation, collection and shipping of aid to the afflicted regions. [31]

Of particular interest is the longer-term recovery and rebuilding effort. Let us first consider the specific case of Taro, the village that lost 83 percent of its population. Following the 1896 disaster, those who survived and some newcomers attempted to move to a safer location at the base of a mountain but ultimately failed to do so. The 1933 tsunami once again wiped out most of the village. Instead of relocating, survivors began constructing a 10-meter-high seawall, the full length of which was completed soon after the war. Postwar Taro Town thrived in the shadow of this fortress-like seawall, and not always behind it.

On a recent visit to Taro, Ito Kazuaki was surprised to see houses and shops on the seaward side of the wall.[32] A recent Internet search using the term "田老町" (Taro-cho) reveals photos of the seawall and surrounding areas, memorials to the 1896 and 1933 disasters, a tsunami evacuation direction sign, and, sadly, the twisted wreckage of the town after March 11, 2011.[33]

The Destruction of the "Model City" of Taro

In 2003, on the 70th anniversary of the 1933 disaster, the town formally issued a "declaration of a tsunami defense town" (*tsunami bosai no machi sengen*) in honor of those who died, and styled itself as a "disaster-defense town" (*bosai no machi*, also the title of a booklet published by the local board of education).[34]

Taro boldly standing up to the fury of the sea is, of course, a tragic testament to overconfidence. It is hardly unique in this regard. In examining all of the communities that made plans to relocate after the 1896 disaster, a majority were either unable to put their plan into action or gradually moved back to low-lying areas. Communities that relocated to higher ground and remained there usually suffered little or no damage in 1933. Some specific

examples illustrate the range of possibilities. Funakoshi in Iwate relocated to higher ground by extending a road up a mountain and building houses on either side of it. Tanohama, which had been wiped out, planned to merge with Funakoshi and redistributed land at the same location. New Tanohama residents, however, unaware of the danger, gradually relocated closer to the coast. In 1933, Tanohama was destroyed again, but Funakoshi escaped with no damage. Yoshihama escaped damage in 1933 by similarly extending a lowland road up a mountain and relocating there. Ryori moved several residences to high ground, but over the years, villagers returned to the original location. The village was devastated again in 1933. Hashikami in Miyagi entirely relocated to high ground, assisted by the prefecture building a new road. Damage in 1933 was light.[35] Notice the key role of infrastructure in the form of roads to support communities that successfully relocated.

It is significant that the trend to return to original locations, or otherwise to abandon safe venues and move lower and closer to the coast, greatly accelerated after the passing of 10 years. It is as if historical memory, or at least the sense of danger, greatly diminished after the passing of a tsunami-free decade. Other reasons for remaining in or returning to low-lying areas included convenience for those in the fishing industry, a lack of potable water after moving, inconvenient road networks, the main part of the community remaining where it had been, attachment to ancestral land, a tendency gradually to make temporary huts used for work into permanent dwellings, and an influx of people into the area without knowledge or experience of tsunamis.[36] Many similar issues are likely to play a role in the future of the region.

LOOKING AHEAD

"*Tsunami tendenko*" is a well-known expression in the Tohoku region. It means that when a tsunami is on the way, run for dear life and pay no attention to anything or anyone else. The expression highlights the sense of urgency that became so clear to people around the world watching videos of the sea's deadly advance on March 11, 2011. Although a variety of lessons are prominent now, in the immediate aftermath of the disaster, this study suggests that historical memory and an acute sense of danger will fade fair-

ly rapidly. Individuals and society as a whole obviously face a major challenge moving forward in the region, particularly with respect to rebuilding. Demographics may be a factor in favor of longer-term safety. With the population of the area already declining, rebuilding in safer locations may be slightly more practical than a generation ago. Yet this may be weighed against factors that make the original location desirable.

The recent disaster revealed both strong and weak points in Japan's earthquake and tsunami preparedness. Earthquake-resistant buildings in the Tokyo area generally performed as expected, as did other systems such as emergency-shutdown mechanisms in trains. The shortages of food and fuel in Tokyo — despite the city receiving only a glancing blow — suggest much greater distribution problems in store should a large urban area be hit with a major earthquake. The issue of nuclear power-plant safety, of course, is a relatively new and vexing problem in a country with few energy options.

Ideally, the recent Tohoku disaster should work against complacency in other areas of Japan vulnerable to large earthquake and tsunami combinations. The Tokyo area is vulnerable both to an ocean trench earthquake like the Great Kanto Earthquake of 1923 and to the rupture of faults under the city itself such as occurred in the Ansei Edo Earthquake of 1855 (no tsunami). Strain has been accumulating behind the Nankai Trench such that areas from the Kii Peninsula to northern Kyushu could at any time suffer a Tokai or Nankai earthquake (or both, as in 1707 and 1854), which would almost certainly generate massive tsunamis. All of these possibilities involve major urban areas.

Finally, the 2011 Tohoku quake is directly relevant to the Pacific Northwest coast of the United States and southern Canada. In this region, precisely the same type of M9-class seismic events have happened approximately every 500 years for the same reason, subduction of the Pacific Plate. The most recent such event took place on January 26, 1700. Estimates of the earthquake's magnitude range from 8.7 to 9.2. Extensive Japanese records of an "orphan tsunami" (*namishigo Genroku tsunami*) led investigators to discover that an earthquake and tsunami had devastated coastal areas of the Pacific Northwest, even submerging entire forests. Tsunami evacuation signs are now common in coastal areas of Oregon and Washington state, and researchers have discovered extensive evidence in the myths and leg-

ends of native peoples of massive earthquakes and tsunamis in the past. [37] Outside of Native American lore, however, today's Pacific Northwest possesses no collective memory of disastrous seismic events and is in many other ways less prepared for the possibility of a disaster than its cross-plate neighbors in the Tohoku region of Japan.

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Endnotes

[1] Okada Yoshimitsu, Saishin Nihon no jishin chizu (Tōkyō shoseki, 2006), p. 52.

[2] Itō Kazuaki, *Jishin to funka no Nihonshi* (Iwanami shoten, 2002), pp. 106-7.

[3] Koshimura Shun'ichi and Shutō Nobuo, "Meiji Sanriku jishin tsunami," in Chūō bōsai kaigi, *1896 Meiji Sanriku jishin tsunami hōkokusho*, 2005, pp. 15-17.

[4] Koshimura and Shutō, "Meiji Sanriku jishin tsunami," pp. 15, 17-20. See diagram 2-9 for three possible models for this process. Most reference books do not distinguish between magnitudes for the earthquake versus the tsunami and typically state a magnitude of 8.5 for the entire event.

[5] See, for example, Jay Alabaster, "Tsunami-hit towns forgot warnings from ancestors." Associated Press, April 6, 2011. Alabaster mentions the "tightly knit community of Aneyoshi," part of Miyako City, as a place that fared relative well in the recent disaster.

[6] For details of the complexities of tsunami height calculations and the conclusion that a 38 meter height at Ryōri is a reasonable estimate, see Koshimura and Shutō, "Meiji Sanriku jishin tsunami," pp. 25-30.

[7] Shinsai yobō chōsakai, eds., *Dai-Nihon jishin shiryō,* vol 1 (kō), pp. 38-39, *Itō, Jihin to funka*, p. 107, and Koshimura Shun'ichi, "Sanriku chihō no tsunami saigai gaiyō," in Chūō bōsai kaigi, 1*896 Meiji Sanriku jishin tsunami hōkokusho*, 2005, p. 3.

[8] Koshimura, "Sanriku chihō," pp. 3-4, and Itō, *Jishin to funka*, 107. For an example of a detailed account of the event describing the precise reach of the water, see Tōkyō daigaku jishin kenkyūjo, ed., *Shinshū Nihon jishin shiryō,* ho (supplement), p. 98.

[9] "Higashi Nihon daishinsai: senjin wa shitteita 'rekishi gaidō' shinsui sezu," in *Mainichi shinbun*, April 19, 2011, link.

[10] Koshimura, "Sanriku chihō," p. 4.

[11] "Namazu ga ugoku to kanarazu jishin ga okoru," in *Yomiuri shinbun*, April 1, 1932, morning edition, p. 7. See also excerpts of a presentation Hatai gave on his research, "Namazu no ugoki de jishin o yochi," in *Yomiuri shinbun*, October 14, 1932, morning edition, p. 4.

[12] "Ika toresugi wa dai-jishin no zenchō? . . . senmonka mo kyōmi," in *Yomiuri Online*, May 1, 2011, link.

[13] Koshimura, "Sanriku chihō," p. 5.

[14] Itō, *Jishin to funka no Nihonshi*, pp. 107-113, and Okada, *Jishin chizu*, p. 58.

[15] Okada, *Jishin chizu*, p. 59, and Itō, *Jishin to funka no Nihonshi*, p. 117. For pho-

tos of Ryōri Bay before and after the 1933 tsunami, see this site.

[16] Okada *Jishin chizu*, p 50.

[17] As Rodney C. Ewing and Jeroen Ritsema point out, "In the case of the Fukushima Daiichi power station, the magnitude of the earthquake (9.0 on the Richter scale, or M9) and subsequent tsunami (with a reported wave height of 14 meters) exceeded the credible event on which the nuclear power plant's design was based." See "Underestimating nuclear accident risks: Why are rare events so common?" *Bulletin of the Atomic Scientists,* May 3, 2011, link.

[18] Regarding these stone monuments, see the widely reproduced article by Martin Fackler, "Tsunami Warnings for the Ages, Carved in Stone," *New York Times*, April 20, 2011, A6.

[19] "Zoku jishin zassan," in Shinsai yobō chōsakai, *Dai-Nihon jishin shiryō*, pp. 420, 423. For more examples of villagers fleeing to high ground in advance of tsunamis, see, pp. 419, 462, 467, 469-471, 482-483.

[20] "Jishin nikki," in Shinsai yobō chōsakai, Dai-Nihon jishin shiryō, vol. 2 (otsu), p. 488.

[21] Nishiyama Shōjin, "Ansei nankai jishin ni okeru Ōsaka de no shinsai taiō," in Chūō bōsai kaigi, *1854 Ansei tōkai jishin, Ansei nankai jishin hōkokusho*, p. 51. The decree was issued one day after the main shock of the Tōkai earthquake, just before the Nankai earthquake and its tsunami struck.

[22] Nishiyama, "Ōsaka de no shinsai taiō," pp. 51, 55-59, 62. For an image of the carnage, from the popular press, see this address(upper left image).

[23] Shutō Nobuo and Koshimura Shun'ichi, "Meiji Sanriku jishin tsunami ni yoru higai," in Chūō bōsai kaigi, *1896 Meiji Sanriku jishin tsunami hōkokusho*, 2005, pp. 22-25.

[24] Itō, *Jishin to funka*, p. 113 and Kudō and Koshimura, "Higai," p. 38.

[25] Shutō and Koshimura "Higai," pp. 38-41.

[26] Shutō and Koshimura, "Higai," pp. 45-46.

[27]For a thorough discussion of the emerging concept of hygiene, including in Meiji Japan, see Ruth Rogaski, *Hygienic Modernity: Meanings of Health and Disease in Treaty-Port China* (Berkeley: University of California Press, 2004).

[28] Quoted in Shutō Nobuo and Koshimura Shun'ichi, "Gyōsei no ōkyū taiō," in Chūō bōsai kaigi, *1896 Meiji Sanriku jishin tsunami hōkokusho*, 2005, p. 47.

[29] Shutō and Koshimura, "Gyōsei," p. 48.

[30]. Shutō and Koshimura, "Gyōsei," pp. 49-50.

[31] Shutō and Koshimura, "Gyōsei," pp. 51-59.
[32] Itō, *Jishin to funka*, p. 118 and Shutō Nobuo and Koshimura Shun'ichi, "Meiji sanriku tsunami saigai kara no fukkō," in Chūō bōsai kaigi, *1896 Meiji Sanriku jishin tsunami hōkokusho*, 2005, p. 91.
[33] See also "Bōsai no machi mo kaimetsu . . . Tarō no higeki." Link.
[34] For the text of the declaration, photos and details of the 1933 disaster and subsequent seawall, see Yamashita Fumio, "Sanriku Kaigan Tarō-chō ni okeru 'tsunami bōsai no machi sengen' to dai-bōchōtei no ryakushi," in *Rekishi jishin*, no. 19 (2003), pp. 165-171, link.
[35] Shutō and Koshimura, "Fukkō," pp. 91-92.
[36] Shutō and Koshimura, "Fukkō," pp. 92-93.
[37] For a detailed analysis of the orphan tsunami see Brian F. Atwater, et al., *The Orphan Tsunami of 1700 (Minashigo Genroku tsunami): Japanese clues to a parent earthquake in North America (Oya-jishin wa Hokubei seikaigan ni ita)* (Reston, VA: United States Geological Survey, distributed by University of Washington Press, 2005). Regarding myths and legends as clues to past seismic events, see R.S. Ludwin and G. J. Smits, "Folklore and earthquakes: Native American oral traditions from Cascadia compared with written traditions from Japan," in L. Piccardi and W. B. Masse, eds. *Myth and Geology* (London: The Geological Society, 2007), 67-78, 86-91.

CHAPTER 3
Looking Out on the World



IWATE PREFECTURE ON MARCH 22 (PHOTO BY PHILIPPE LOPEZ/AFP/GETTY IMAGES)

"If it was really bad, I don't think they would cover it [on the news], so I guess it will probably be all right."

—Fukushima resident

Leaks in All the Wrong Places
by Christian Caryl

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LEAKS IN ALL THE WRONG PLACES

BY CHRISTIAN CARYL

As I was trolling through coverage of the Japanese earthquake disaster, I came across a revealing *vox pop*. A man named Takayuki Sato was talking to Reuters in Fukushima, the town that's home to the nuclear power plant damaged by the quake and the ensuing tsunami. "What they're saying on the news is that even if you're exposed, it's only about one-fourth of the level of getting a stomach X-ray," said Sato. "If it was really bad, I don't think they would cover it, so I guess it will probably be all right."

Let's parse that for a second. Sato was saying that he was reassured that the problems at the stricken reactors aren't all that bad because the government doled out a teaspoon of information — whereas a total blackout would mean that something really scary is going on. Doesn't exactly sound like a vote of confidence in the Japanese government or media, does it?

What's more, I suspect that Sato, in his pronounced skepticism, is actually speaking for most of his compatriots. (This assumption is based on my own experience as a foreign correspondent in Japan, where I lived from 2004 to 2009.) That ordinary Japanese citizens might have grounds to question official utterances was borne out early in this latest nuclear crisis. The first explosion at the Fukushima Daiichi power plant occurred at 3:46 p.m. on Saturday, March 12, but Japan's government didn't officially confirm the event for another two hours. And it was only five hours after the explosion that Chief Cabinet Secretary Yukio Edano finally announced that the containment vessel remained intact and that a major release of radioactive material had been avoided — not that he provided much in the way of concrete data.

That prompted a spike of criticism in the media. The *Asahi Shimbun*, one

of Japan's leading daily papers, quoted a senior lawmaker of the ruling Democratic Party of Japan to this effect: "Every time they repeated 'stay calm' without giving concrete data, anxiety increased." The paper ran a headline that said, simply enough, "Crisis management is incoherent" and assailed the government for taking its time to disclose information. "The way the government provided information is questionable," the *Yomiuri Shimbun* said in one of its editorials. That's pretty harsh language by Japanese standards.

History offers ample grounds for cynicism, I'm afraid. Back in 2007, when another earthquake triggered the shutdown of reactors at the world's largest nuclear complex in Kashiwazaki on Japan's west coast, it took Tokyo Electric Power Co. (TEPCO) — the same company responsible for the reactor in Fukushima — a good nine hours to notify local authorities that there was a problem, prompting some harsh criticism from leading Japanese politicians. And that was just one in a long history of cover-ups, major and minor, by the Japanese nuclear industry.

Many Japanese still have grim memories of the 1995 Kobe earthquake, when the government took days to ramp up a proper response to the disaster and compounded its problems by poor coordination and scanty information about what was happening. Many Japanese still have bitter memories of the three days it took the government to approve the dispatch of foreign rescue teams equipped with special rubble-sniffing dogs.

These breakdowns didn't happen by accident. The habit of keeping your cards close to your chest has deep roots in Japanese history and culture. Traditional Japanese etiquette prizes elegant circumspection over crude straight talk. In the Japanese language, forms of address shift markedly depending on whether you're talking to someone within your own group or outside it — an effect sometimes mirrored in the ways Japanese organizations (all the way up to fiercely rivalrous government ministries) handle information. An American friend in Tokyo told me how he once encountered reps from a leading Japanese computer company at an Internet conference in the United States in 1995. "We went to Starbucks together, and they said, 'We don't get it. Why would we want to use the Internet to talk to people outside of the company?' " Politicians in Europe or the United States may sound frustratingly evasive much of the time, but they're generally models of clarity and concreteness compared with most of their Japanese counterparts.

This isn't quite the whole story, though. Cultural reflexes may die hard, but they can certainly change — and so it is in Japan, too, as the pressures of globalization make themselves felt. Whistle-blowers, once virtually nonexistent in Japan, are cropping up with increasing frequency, especially since the government passed a law protecting them in 2004. The Internet is steadily chipping away at old walls that once surrounded colluding interest groups — like the *kisha* clubs, the industry- and institution-specific press organizations where the price of access for reporters is the tacit willingness to not ask too many uncomfortable questions.

Jeff Kingston, a history professor at Temple University in Tokyo, notes that the scandal of the 1995 earthquake actually helped break down a long-entrenched ethos of secrecy and obfuscation in Japanese public life. In 1999, he points out, the Japanese government issued a public-information disclosure law that allowed citizens and nongovernment organizations to register official requests for information with government institutions. The number of applications has since skyrocketed — good evidence that both ordinary Japanese and the bureaucracy are taking the measure seriously. But, as the Sendai earthquake crisis demonstrates, there's still a way to go. "The level of transparency has improved a great deal, but the government track record on managing nuclear accidents makes people skeptical about the ambiguous announcements," Kingston says. "The mixed messages are spreading anxiety."

Newspaper headlines like this one in *Yomiuri* — "TEPCO official hints meltdown may be under way" — probably don't help, either. To be fair, of course, it's a safe bet that no one — government or otherwise — is getting solid information from the quake zone right now. Telephone networks, both mobile and land-line, are still out of commission in large swaths of the quake-affected region. Evacuations, damaged roads and rail lines, and the complex machinery of the huge relief effort now swinging into gear don't make the job of gathering and spreading information any easier. And, of course, there's also the tricky imperative to avoid sowing needless panic. So we should certainly cut the Japanese government some slack on this score. But that doesn't mean we should give them a pass, either. The Japanese public isn't.

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JAPAN AND NEW YORK: CELEBRITIES, THE INTERNET AND GENUINE EMOTION

BY DEVIN STEWART

The day after the September 11 terrorist attack on New York City, Jean-Marie Colombani, editor of the French newspaper *Le Monde*, famously declared, "We are all Americans." At that time, I was living in Tokyo and witnessed abroad the solidarity, as Colombani expressed in his article, the world felt with the United States. Ten years later, I was living in New York City, working at Japan Society, and I witnessed a similar sense of solidarity toward Japan after the March 11 earthquake.

Although global giving has been smaller than in other disasters, for example in Haiti or New Orleans, Japan's relationship with the world has entered a period unlike any other in its history. Whether Japan will seize this moment to shed the recent inward-looking attitude among young people, or its "Galapagos syndrome" as I have written elsewhere, is uncertain. Given the gratitude Japanese have felt toward the U.S. military for its help during this recent crisis, there is a chance that the a new cohort of pro-American Japanese will succeed the generation that experienced a benevolent U.S. occupation after World War II. What is certain, however, is the sense that the world is with Japan as at no other time. As actor George Takei wrote on his blog on March 11, "Today, we are all Japanese."

One of the defining characteristics of this disaster has been the extent to which the world could experience the hardships in real time along with Japan. From the early Friday morning after the initial earthquake, I had my

television tuned to Japan's public station NHK, which broadcast live reports on the crisis. Japan, as a modern, industrial society that leads in many video, camera and phone technologies, could show the world what was happening as with no other disaster. Footage captured from cell phone cameras, security cameras and other video cameras were broadcast, as special reports, clips and rapidly produced documentaries on the major networks and the Internet. Thousands of photographs and videos of the disaster, aftermath and rebuilding have become available. One independent team of Japanese journalists, for example, filmed the area around the damaged nuclear plant, revealing an eerie, lawless ghost town. Unlike with the disasters in Haiti, China and Indonesia, the plugged-in attentive global public could easily identify with the quake's victims in Japan given the similarity of the stage of economic development and the ubiquity of Japanese culture worldwide.

As Colin Harrison, a distinguished engineer with IBM who was in Narita Airport during the quake, said to me, "This was the first disaster in an industrial society postglobalization." Keizai Doyukai's policy manager Takaaki Asano agreed, telling me that now, "Japanese really feel part of the international community," given the support offered from abroad and the reliance on foreigners to help out. He cited the area of robotics — usually an industry that Japanese feel pride in — that needed foreign assistance. Robots from France, Germany and the United States have been deployed to respond to Japan's nuclear crisis and conduct search and rescue. Although Japan was leading the field in the 1980s, due to budget constraints, the most recent robots designed in Japan were not built to handle this type of work.

Here in New York, the outpouring for Japan has been overwhelming.

In less than a day after March 11, Japan Society, a more than 100-year-old American institution, transformed itself from primarily a cultural institution into one of New York's leading charities to support Japan, establishing the Japan Earthquake Relief Fund, which collected about $6 million from 16,000 donors by early May. The first donation of $50 was made at 8:17 in the morning of March 12. During the first week, a donation was made every two minutes. As of early May, donations have ranged from $5 to $250,000, which is the amount the Stavros Niarchos Foundation gave. One million dollars of this fund has gone to Tokyo Volunteer Network for Disaster Relief, JEN, Entrepreneurial Training for Innovative Communities, and the

Japan NPO Center — all on the front lines of relief and recovery in northeastern Japan. Japan Societies across America have joined in, with those in Hawaii and Southern California leading after Japan Society New York.

The amount of work — from stuffing envelopes to answering tax questions — needed to achieve this feat required most of the Japan Society staff to work virtually nonstop for more than a month on a volunteer basis. Japan Society's current operating budget has had to absorb staff time, administrative costs and credit-card fees. This also came at a time when Japan Society had recently pared the size of its staff and was gearing up for two major annual events, one its annual dinner with 650 guests. Without our solicitation, meanwhile, the fund has acquired an extraordinary level of public recognition with celebrities, including David Byrne, Keith Richards, Wynton Marsalis, Yoko Ono, Lou Reed, Laurie Anderson, Philip Glass, Ken Watanabe, George Clooney, Kevin Kline, Martha Stewart, Mario Batali and Chef Masa Takayama, endorsing or supporting it.

Donations to the fund, though mostly from Americans, have come from all walks of life, and many initiatives at schools were driven by Japanese parents living in New York or those with a connection to Japan Society. A Buffalo school had a red-and-white dress-down day that raised $1,300. The Japanese Group of Buffalo (New York) held a Japan Day festival on April 18 and raised about $8,000. A group from Lehman College in the Bronx pledged to the fund, and parents and students from P.S. 59 Beekman Hill International near Japan Society delivered money in person. An English-as-a-second-language teacher in Harlem, who used to work in our membership department, collected donations from concerned elementary-school students. They've raised more than $550 — a demonstration of young students' desire to reach out to kids in Japan. A woman who worked in the Japan Society gallery organized a bake sale with a group of Japanese mothers in Brooklyn, raising $3,800.

Small businesses, such as the famous Magnolia Bakery and numerous renowned restaurants, such as Eataly, En Brasserie, Sushi Zen and Cafe D'Alsace, throughout the city chipped in to support Japan Society's fund. Brazilian martial arts instructors from a Capoeira center in New York City donated $700 from benefit lessons they organized and facilitated, and a man from the Bronx organized an outdoor barbecue in the cold weather and delivered more than

$3,000. Hand in Hand Project did a performance in Central Park and handed in $3,398.15 in cash. The effort was led by Tadaaki Iwaki (DJ Aki), who performed at our concert, and pop-and-lock street-dance performer Kenichi Ebina, who performed at a Japan Society Annual Dinner fund-raiser a few years ago. A swing-dance group organized by Japanese women presented a Swing for Japan fund-raiser and hand-delivered a $5,700 check. A downtown fashion house had a sample sale in March that raised $26,744 for our fund. KOG Transport, a freight company, donated its entire budget for the company's 30th anniversary to the fund. Another somewhat surprising source of donations was from U.S. branches of Japanese corporations.

Within a couple of weeks, Japan Society reconfigured two major events to deal directly with the disasters, educate the public on the situation and create a place where people could support Japan and exchange information and sympathies. We reorganized a March 23 panel discussion that had been in the works for months and originally meant to address Japan's recent turn toward isolation. Japan Society also turned its annual open house into a 13-hour marathon benefit Concert for Japan, which attracted about 2,400 people at Japan Society and more than 200,000 who attended online. Many of those commented on Ustream, "I am touched to tears" and "We are so inspired" in Japanese, which accounted for the majority of the comments, especially when we showed photos of Japan Society staff and friends holding inspiring messages for Japan. The concert raised $88,000.

Beyond Japan Society, in less than 16 hours, James Gannon of the Japan Center for International Exchange (JCIE) convened a special meeting in New York of 30 people representing the major Asia-related organizations in New York City and Washington, DC, to coordinate civil society efforts. He said that people in New York City felt a special obligation to help Japan because of how connected the community felt to Japan and the sense that we were in a position to help in ways others could not. He sees the giving from abroad as essential to the development of Japan's budding civil society.

"The most amazing thing was the funds and the diversity of people doing special things," Gannon said to me. "One of the most touching stories was [that] a couple in California devoted their wedding registry to donations to Japan. People around the country have personal connections with Japan."

At the end of March, a group of professional filmmakers put together a

YouTube video called "Rise Again, Japan!" that sent a "message from New York to the world" that something can be done for Japan despite the country's distance to New York: giving to organizations that are helping such as the American Red Cross, Google Crisis Report, the Mayor's Fund to Advance New York City and Japan Society's fund. The video featured everyday New Yorkers — from cabdrivers and guys playing basketball to parents and children — as well as more well-known figures Robin Williams and Ice-T conveying messages of hope. To illustrate the giving in New York, the video featured footage from a fund-raising effort that produced piles of boxes full of cash and a large sack of coins and a rally of hundreds of people, including Japanese mothers, held in New York's Union Square on March 17. It was organized by Japanese mother Naoko Fitzgerald by using email and social networking and a Facebook group she set up called Japanese New Yorkers and Moms United to Support Japan.

"I first learned about the quake on Facebook from my mommy friends in New York who were offering prayers for Japan," said Fitzgerald, who is married to an American man and lives in New York. "I turned on Japanese TV and saw the tsunami, which was like an unbelievable science fiction movie, and I began to cry. The next day I saw mothers saying they were in need, and I couldn't help talking about it without crying. I knew everyone in New York was probably going through the same emotional period. I wanted to show to Japanese that New York and the American community are doing something to help. There was a *New York Times* article [published after the earthquake] that said Japanese abroad don't stick together, and I wanted to show them it was wrong.

"I believe this could be a turning point for Japan and the world," Fitzgerald said. "I think Japanese civil society is getting so much attention; now is the time to learn from one another. It is a chance for Japanese civil society. JCIE is the best example [of Japanese civil society]." Fitzgerald worked at JCIE's New York office for two years.

Gannon of JCIE reflected on that extraordinary rally in Union Square in support of Japan organized by his former colleague. "When people walked up to Naoko [Fitzgerald] to donate, people were crying. When was the last time you saw the world crying about what happens in Japan? When was the last time you saw Japanese on the street corners trying to raise money

to help Japan?" he asked rhetorically. "Something had changed — it was a moment."

That may be one of the most hopeful effects of this crisis. Stereotypes about Japan have gone through many phases in the American imagination. During World War II, Japan was a foreign enemy, and afterward it was the occupied. In the 1950s and 1960s, Japan was seen as a mystical place offering "exotic" traditions such as tea ceremony, karate, geisha and Zen Buddhism. In the 1970s it was a place that produced cheap manufactured goods, but by the 1980s, Japan was called a threat to the U.S. economy due to its success, which led to Americans bashing the Japanese for their competitive edge. After the bursting of Japan's financial bubble in 1991, however, Japan seemed to fade from relevance during its so-called lost decade. But most recently, Japanese cultural exports, such as video games, cuisine, manga and anime, have simply become part of a global culture. Whereas in the past to study Japan was something specialized, now knowing Japan is considered part of being a globally minded, informed person. In that sense, the recent disaster may have helped extend the trend of Japan becoming a place people relate to. This perspective is shared among the students I teach at New York University.

A new door to the world also has opened for Japan. One potential effect on how Japan views itself in the world may come from its experience with and participation in Operation Tomodachi, the deployment of 18,000 U.S. personnel who helped with disaster relief and the delivery of emergency supplies. Japanese newspaper editorials thanked the U.S. military, and the Japanese foreign ministry ran a video about 400 times through May 15 on CNN that thanked Americans for the disaster assistance and in the spirit of reciprocation sent $125,000 worth of blankets and sheets to the American South after it was hit by deadly tornadoes in May. Other international connections are being made through the introduction of foreign companies helping with the reconstruction and the surge of good will from nonprofits, charities and foundations helping from abroad and in Japan. In the months following the disasters, many Japanese companies will consider pushing more of their operations abroad — to the United States, China or Southeast Asia — to hedge against risk, further internationalizing corporate Japan. With 190,000 small and medium-sized enterprises affected in Iwate, Miyagi and Fukushima, as many as one-third of companies in some industries are

considering relocation.

On the other side of the coin, interest in Japan has reached new heights with searches for and mentions of Japan on Google and Twitter reaching records since those data have been collected. According to a Pew Research Center Project for Excellence in Journalism poll, during March 14-18, 64 percent of blog links, 32 percent of Twitter news links and the top 20 YouTube videos were about the disasters in Japan. Japan Society itself focused on providing helpful postdisaster information and witnessed a 25-percent jump in its number of followers on Twitter during this crisis. Cyndi Lauper tweeted about our fund, creating a burst of buzz and retweets. Through social networks like these, the story about Japan has been kept alive beyond the news cycle.

Many people in Japan and abroad turned to Twitter and Facebook for real-time news, advice on disaster response and rapid communication, especially as cell phone connections were down immediately after the earthquake. Days after the quake, U.S. Ambassador John Roos received requests for help via Twitter to transfer patients from a hospital in Chiba. Roos passed along the message to his staff, and within an hour Japanese Ground Self-Defense Forces troops were dispatched to help, according to an April 12 *USA Today* article. Fitzgerald, the rally organizer, told me that although Facebook usage is comparably low in Japan, she always encourages her friends to try it and "ditch Mixi" (Japan's main social network) because Mixi is only in Japanese while Facebook offers more connection with the world.

Takashi Yoshizaki, a Japanese information technology consultant who lives in New York and follows social networking closely, agreed that these Internet tools provide a connection for Japan and the world. "People in Japan feel a sense of integration with the world, especially because of social networking, which allowed them to share information though Facebook and blogs," he told me. But there are some caveats. First, he was concerned that it took a shock, saying the sense of connection "was induced by an external factor [the quake], so I am not sure if it will be sustainable. Without the quake, they wouldn't have done anything so intimate with the international community — they didn't do it on their own."

Second, these social networks are only a tool or a process. They don't constitute a rallying point or a galvanizing issue. "The fundamental ingredient needed [for] successful social media is having a community dedicated to a

cause. It isn't about technology; it's about people. Without that cultural force, it won't thrive," he said. One possible galvanizing issue is the need for more green technologies and alternative energy in Japan, as Tetsutaro Muraki, CEO of Tokyo AIM, advocated at Japan Society in April. The nation went through a dramatic shift in energy policy after the oil shocks in the 1970s, and perhaps the nuclear crisis could push the country into another revolutionary shift. A second issue that the nuclear crisis has highlighted is transparency, broadly speaking. Japanese have looked abroad for foreign sources of information in frustration with their country's press, and the current dismay in the government's handling of the crisis has a lot to do with a sense that officials, politicians, and companies were holding back information. Transparency could be a rallying cry that weaves all of these issues together.

Yuko Nakamura, a Japanese social media consultant working in Montreal, is hopeful and sees Facebook as a medium for introducing change in Japan. She says that the disasters proved to people in Japan how useful international social networks can be, and these tools can help open peoples' minds to new cultures and ideas. "Japanese people seem to finally realize how to integrate their life on Facebook and Twitter by communicating with each other — even some of them are trying it in English. It's different from what they do on Mixi, which is more like a diary, while Facebook is a communications tool. When they didn't have an access to information about the earthquakes, they used Twitter to know where to evacuate and Facebook to find whether their friends and families were OK." Social networks can reverse Japan's recent inward-looking attitude and its Galapagos syndrome, particularly by empowering Japanese women to start entrepreneurial ventures online, she said.

Whether Japan will take advantage of this crisis is uncertain. What we do know, though, is that Japan is now closer to the rest of the world, and the U.S.-Japan friendship is stronger than ever. More specifically, the deeper bond between Tokyo and New York City, the two largest metropolitan economies in the world, and the affected areas creates a lasting sense of solidarity as Japan rebuilds.

Devin Stewart is senior program director at Japan Society as well as a Carnegie Council senior fellow and a Truman security fellow.

NGOS AND VOLUNTEERS: RESPONDING TO JAPAN'S DISASTER

BY JEFF KINGSTON

John Diksa of the disaster-relief charity ShelterBox always carries a disaster-warning device, and on March 11 in quick succession he got a red quake alert and red tsunami alert for Japan. Within minutes Diksa, who lives in France, was on his way to the airport. He arrived at Narita on March 12, immediately making his way north to Tohoku (the northeastern region of Japan pulverized by the tsunami) with three other team members, all ex-military. They tapped into their Rotary International network in Japan, including the president of Mitsui OSK shipping. High-powered Japanese Rotarians opened doors, obtained permissions, and provided four-wheel drive SUVs, gas and translators, helping the team make a quick assessment. Within a week they had 750 ShelterBoxes — 55-kilogram kits containing large tents (4.5 meters by 4.5 meters), blankets, cooking utensils and other survival gear — delivered by Virgin Atlantic gratis. "They told us Japanese won't use tents, but they do," Diksa said in early April. "First it was as privacy corners in evacuation centers, then as isolation tents for the sick. Now people who want to clean up their homes and businesses are using them rather than staying at the evacuation centers because they don't have fuel to get back and forth." Crucially, tents keep survivors warm and dry in the immediate aftermath of a disaster. Proudly he says, "We are nimble and fast," Diksa said, "getting to the scene of the disaster and getting kits on the ground before anyone else. No country in the world could cope with a di-

saster of this magnitude on its own, but no other country can match Japan's preparation and rollout. We just tide people over until the big boys come in."

By responding rapidly and effectively to Tohoku's tragedy, nongovernmental organizations (NGOs) are showing Japanese how crucial they are. Civic space and economic support for NGOs in Japan has been limited, but their rapid and impressive response is changing the dynamic. Hironobu Shibuya, CEO of Save the Children Japan (SCJ), laments the red tape that snarled relief efforts following the Kobe quake in 1995. "While each layer of decision maker was waiting authorization from one step higher up, more people ended up dying and more buildings ended up burning down," he said. This time around he encountered, at least initially, the same official resistance. "It was, frankly, excruciatingly frustrating to go through the classic case of bureaucratic inertia on the part of local authorities, notwithstanding the fact that, given the prevailing situation, the principal and/or official in charge should just give us permission." Rather than looking at civil society groups as the cavalry, the government continues to view them with suspicion, an attitude not shared by many Japanese who appreciate the good work they are doing.

In Shibuya's opinion, the large amounts of money donated by Japanese citizens and corporations to NGOs are a vote of confidence that is richly deserved. Across Tohoku, NGOs have hit the ground running, constantly adapting to the moving targets of evolving needs and shifting populations. Ikuko Mori of SCJ says this is the hardest part of the job. "We do an assessment one day and the next people have moved, so we have to try catching up with their needs." Kana from Miyagi-ken Kodomonokai (Association for Children), the local partner of SCJ, returned after three years in Australia only days before the quake struck, and never expected to be supervising a child-friendly space in Ishinomachi, trying to help volunteers work with a constantly changing kiddie clientele to cope with life as evacuees.

Daniel Kerr, an emergency logistics manager with Save the Children Australia, flew in with colleagues to pitch in. Ex-military with stints in East Timor, Cambodia, Afghanistan and various hot zones in northern Africa, he has seen dire situations, but nothing prepared him for what we saw in Onagawa (Miyagi prefecture), a town blasted away by an 18-meter tsunami. We saw cars perched precariously on top of what was left of four-story con-

crete buildings that were all that had withstood the blast of seawater. "War doesn't cause this much damage," Kerr said. "This is a massive disaster and the Japanese government's response has been amazing and fast, far beyond what you see anywhere else. The SDF [Japan's Self-Defense Forces] has done an incredible job restoring basic infrastructure and distributing relief supplies."

In Kerr's view, restoring some semblance of normalcy to communities and lives turned inside out will take time, money and creative NGO initiatives. Even as charities drag their feet on distributing the vast amounts of donations they have amassed, NGOs are on the job. In Ishinomachi (Miyagi prefecture) there are herculean efforts underway to shovel away the mud, get rid of the garbage, and repair all that is broken. As survivors pick themselves up, dust themselves off and get on with it, NGOs are lending them a much needed helping hand and jump-starting the recovery.

Jim Sameth, a lawyer from California, flew in for a week in early April to volunteer with Peace Boat (a Japanese NGO) in Ishinomachi. He wrote, "The degree of organization provided by Peace Boat and other NGO groups there was impressive. Truckloads of supplies were sent out each day to remote neighborhoods and shelters, with word spread by radio broadcasts as well as by walking the ruins with a megaphone announcing when and where supplies would be available."

Regarding notorious "flyjins" (*gaijins* — foreigners — who flew out of Japan after the nuclear crisis) Sameth observed, "Volunteers were present from all over Japan, and from all over the world. There are stories of the foreign population fleeing Japan, but I saw many more coming to help, both from within Japan and from abroad. I met an American living in Nagoya who arrived Friday morning with a backhoe on a flatbed truck that he had rented and drove up — something that my experience shoveling mud the previous day made clear would be of tremendous help. "

Post-3/11 Japan is facing its NGO moment, a time when NGOs are earning their spurs and changing public attitudes. They have stepped in quickly and decisively to alleviate the misery and give encouragement.

Save the Children, for example, helped kids get back to school and its reassuring routines by offering uniform vouchers. Kerr tells of contacting school rucksack makers to place a huge order, only to find the industry

generously donating 30,000 of these expensive bags (over $250 each), demonstrating the goodwill that prevails as the nation mobilizes to overcome this mind-boggling catastrophe. NGOs are channeling these good intentions into tangible improvements while helping survivors through the long haul back. This will involve counseling, education, advocacy work, helping survivors navigate their options while shaping government recovery and reconstruction programs to fit survivors' needs and meet their expectations. NGOs will also play a crucial role in organizing the tens of thousands of Japanese and foreign volunteers from all over the nation who want to chip in.

MISSING THE MOMENT?

Government financing is critical to help these ravaged communities rebound and restore livelihoods, but at this NGO moment, the time is ripe for the government to also lighten its regulatory stranglehold and liberalize tax rules to strengthen NGOs and maximize their humanitarian contributions. So far, the government has resisted this opportunity to allow NGOs to blossom.

The government has taken on the gatekeeper role for volunteers eager to help out communities in the tsunami-ravaged northeast. According to Simon Avenell, an expert on Japanese volunteerism at the National University of Singapore, government-organized Shakyo Volunteer Centers (SVC) in Iwate, Miyagi and Fukushima are micromanaging the influx and deployment of volunteers. To some extent this logistical work is helpful, ensuring that volunteers do not become a burden on limited resources and matching volunteers with urgent tasks, but the media have spread the SVC message that volunteers are not entirely welcome, and may be a burden and surplus to needs.

The SVCs have taken the spontaneity out of the volunteerism among young Japanese, and during the Golden Week period in early May when there are a string of national holidays and many people are free, there were repeated warnings against volunteers showing up because there were already too many on hand. It is true that the capacity of the devastated Tohoku region to host volunteers is limited and there are severe infrastructure bottlenecks, but the need for volunteers is very high and many are willing

to rough it and put up with inconveniences. Many civil society groups are working outside this system, conducting their own volunteer programs and accepting as many volunteers as they can recruit, train and put to work. So it is worth emphasizing that the state is not necessarily controlling volunteerism, but is dampening its potential. "I think many people now believe that they will only be a burden if they go to affected areas to help out," Avenell said. Watching all of the meetings between civil society leaders and government officials, I've only seen one person (a Japanese-speaking foreigner) complain that the volunteer centers have too much control over things."

During the Golden Week holidays, April 28 through May 8, disaster-volunteer centers registered some 78,000 volunteers working in Tohoku, averaging 8,000 a day. The numbers peaked at 11,000 a day (Kobe's peak was 20,000), but dropped sharply to 5,000 on May 8. At that time 115,000 people still were living in temporary evacuation centers. Many of these evacuees are elderly and need all sorts of volunteer assistance ranging from psychological counseling and hot meals to clearing debris and assisting evacuees moving to temporary housing as it becomes available.

In 1995 in Kobe during the first month following the earthquake, 600,000 volunteers came to help out, while for Iwate, Miyagi and Fukushima prefectures the comparable figure was only 190,000. Corporate, university and government support has not been sufficient to ensure an adequate flow of volunteers to devastated areas, but access is also far more difficult and Kobe still had a functioning local government. Many in Tohoku don't, and unlike Tohoku, Kobe was surrounded by undamaged towns with extensive facilities that could serve as a base for operations. NGOs in Tohoku have encountered difficulties in finding suitable office space and accommodations and in arranging transport.

There is a tendency for volunteerism to spike just after a disaster and decrease over time. Avenell explained that in Kobe the peak was in the first month following the earthquake and that numbers dropped by a third the following month and by the fourth month into the recovery were only one-sixteenth of the peak. By that time outsiders had returned home and it was largely a local effort. This is not encouraging for Tokhoku because of its high percentage of elderly residents and the far greater swath of destruction. In addition, the Kobe region is wealthier than Tohoku and could mobilize

more resources to address needs in a much smaller area of destruction. In Tohoku, in contrast to Kobe, it was not a matter of only some buildings, highways and bridges collapsing. Rather, entire villages were transformed into piles of debris and in some towns many local government officials perished, creating administrative paralysis.

NGO NICHE

State-managed volunteerism in Tohoku 2011 stands in contrast to the impromptu situation in Kobe 1995. After the Kobe earthquake, tens of thousands of volunteers from all over Japan just showed up and when confronted with bureaucratic resistance did not retreat and found ways to contribute, often through church organizations or small nonprofit organizations (NPOs). This was a spontaneous movement demonstrating the public's goodwill and a youthful idealism unwilling to bend to bureaucratic intransigence. Now the NPOs/NGOs are larger and far better organized and funded. Partly this is because the media badgered the government into passing new legislation in 1998 that facilitated establishment of civil society organizations. The media saw the value of volunteerism in speeding relief and recovery operations in Kobe and played a key role in shaping public discourse and pressuring politicians to jump on board. But the victory was limited as the legislation is flawed and has not worked to fully tap the potential of Japan's civil society. Civil society organizations remain underfunded and understaffed, kept on a short leash by government design.

Partly this is because they can be a nuisance to the government, raising uncomfortable questions, undermining assumptions and providing information to citizens that the government rather they not have. For example, the Tokyo-based Citizens Nuclear Information Center has long lobbied against nuclear power and raised questions about various safety issues. Citizen groups have also been at the forefront of court battles aimed at shutting down nuclear power plants. While the mainstream media has generally been reluctant to investigate nuclear safety and waste disposal issues, at least until 3/11 put nuclear energy into the limelight, the CNIC tenaciously provided information and in a small way, along with like-minded groups such as the Institute for Sustainable Energy Policies, shaped public discourse.

Prime Minister Naoto Kan's request to shut down the Hamaoka nuclear plant in Shizuoka, is something the CNIC and other advocacy groups have demanded ever since it was built, precisely because of the seismic risks and lack of adequate tsunami protection. This nuclear facility is located in an area where scientists expect a massive earthquake relatively soon, and thus Kan's move has won widespread approval in the wake of 3/11. Citizen groups deserve some credit for Kan's choice, challenging the common sense of the blinkered nuclear village, and CNIC has become a go-to website for anyone seeking critical information about Japan's nuclear power program, a subject now attracting great attention. This represents the potential of civil society to influence national discourse and agendas by providing alternative perspectives in a nation where desire for harmony and consensus often stifles needed debate.

From my observations, Japan is reaping the benefits of its generous official development assistance programs and overseas participation of Japanese in NGOs. At JANIC (Japan NGO Center for International Cooperation) for example, Makoto Tajima is heading up disaster response activities after more than two decades working around Asia in projects funded by JICA (Japan International Cooperation Agency), while Futabe Kaiharazuka is an assistant program director at Care International Japan after a decade of overseas experience with JEN (Japan Emergency Network) helping those displaced by war and disaster in various hot spots such as Pakistan and Afghanistan. Save the Children Japan called on its international network, including a Japanese program officer recalled from a refugee project in Pakistan, another from Vietnam, and a former UNICEF program officer who was raising an infant in Nagano. These people had the skills and experience gained overseas to help organize an effective disaster response in Japan, highlighting the virtues of giving.

In addition, 140 countries offered disaster-relief assistance to Japan. Japan has often been a major donor to international relief operations and now is reaping the fruits of its generosity. It is significant that China and Korea, two countries that share a troubled past with Japan that often disrupts contemporary relations, sent relief missions to Japan while Korean charities raised an astounding $52 million in the first two weeks after the tsunami. The tsunami may not propel a full-fledged reconciliation, but the generous

response of neighbors during the crisis will be remembered and create a more positive atmosphere as these "frenemies" seek to overcome the various issues that divide.

Despite government interference and reluctance, media reports from the field and my own observations in Iwate and Miyagi suggest that volunteers are making a huge difference and that their efforts are greatly appreciated by those they are helping. Memories are long, and what they are giving now is an investment in the future, building a growing constituency that understands the importance of NGOs. Volunteers in Tohoku are operating under difficult conditions, but they have certain advantages over the Kobe volunteers, not the least being social networking sites that have facilitated communications.

Social media

Touring the evacuation centers where the elderly are the majority one might think that social media are somewhat irrelevant to the needs of survivors because few of them are adept with new technologies. But volunteer groups point out that social networking has helped tremendously in terms of logistics, helping them recruit volunteers and quickly identify what is needed and where to collect and distribute supplies. Given the fluid situation in evacuation centers where populations fluctuate, rapidly disseminating such information is crucial to relief efforts.

At the beginning of 2011, 14 percent of all tweets were in Japanese, second only to English (50 percent) and it is estimated that 20 percent of all Japanese are using Twitter compared with 8 percent in the U.S.; only about 2 percent of Japanese currently use Facebook. The rapid spread of the "twitterverse" in Japan has enabled it to fend off challengers, and its popularity grew from the allure of anonymity. In addition, the "bot" culture (small software programs that mimic human tweets) has taken hold in Japan, and post-3/11 the most popular service is earthquake alerts. Given all the aftershocks since then, the cacophony of alerts on trains or in cafes can be disconcerting. When the quake cut mobile phone networks, survivors and town officials wanting to contact others and provide or gather information came to appreciate that Twitter is an effective alternative form of commu-

nication. Post-3/11, various town halls, public organizations, the prime minister's office, the self-defense forces and even TEPCO opened Twitter accounts. In addition to coordinating relief work and tracking down missing friends and relatives, Twitter has been useful in raising donations. The power of social networks to strengthen civil society and quickly enable like-minded people and groups to coordinate and make a difference is clearly evident in the aftermath of the Great Tohoku Earthquake. It is also encouraging that companies in Japan are mobilizing employees to participate in volunteer activities and donate money to charities and NGOs. The lessons of Kobe have sunk in, and Japan's tsunami victims are reaping the benefits of a far more robust civil society than existed in 1995.

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"BUT IS IT NOT IN FACT LEAKING A LITTLE?"

BY NORIKO MURAI

This is a reflection on the initial wave of popular responses and images that flooded the mainstream Japanese media following the Great East Japan Earthquake. Since it is impossible to generalize the "Japanese" reaction to this event as such, I merely attempt to characterize some of the responses that were commonly observed in the Tokyo area. The city froze in disbelief and mourning, behind which lurked confusion and fear. If these reactions are likely to be universal and were translated into widely shared acts of generosity such as donations to the Japan Red Cross Society, other common responses to the aftermath of the earthquake were rendered with references that were distinctly topical or Japanese and thus require a bit of explanation. For why did people shed tears to an old schoolchildren's song from 1914, and why has there been a sudden surge of interest in the work of an amateur female children's poet from the 1920s? Why did top government officials decide to appear in clothes reminiscent of a rescue worker or a utility company mechanic? And why would it be considered controversial to write about the nuclear accident in Fukushima precisely by featuring an image of a worker in radiation-protective gear?

The loss of Japan's hometown

The images of the devastated coastal towns have become the most recognizable visual symbol of the Great East Japan Earthquake. The geographical extent and types of damage that were brought about by the recent series of earthquakes were in fact more wide-ranging, but the choice is understand-

able. No other imagery worked as powerfully as these tsunami-annihilated townscapes in portraying nature's ability to wipe out advanced human civilization in a matter of minutes.

The popular Japanese imagination associated with the Tohoku region provided one point of collective reference in coming to terms with the aftermath of what nature destroyed beyond recognition. For example, it was revealing that one of the popularly observed cultural expressions of mourning and consolation was the singing of the old children's song "*Furusato* (Hometown)." The following is the literal translation of words to the first verse:

Chasing the hare on that hill,
catching small carp in that brook,
I dream now and then of
my unforgettable hometown.

I first noticed the singing of this song on NHK news when it reported a free chamber music concert organized by members of the local philharmonic at a shopping arcade in Sendai, the largest city in the Tohoku region that was badly damaged by both the earthquake and the tsunami. The sight of the local audience singing along to this familiar tune, and many in tears, was moving. The playing of this song was widespread from such spontaneous street singing to a grand performance. Even Plácido Domingo sang it as part of the encore in expressing his sympathy for the earthquake victims during his solo concert held in Tokyo on April 10. "Hometown" has been appropriated for other causes as well, including the 1998 Nagano Olympics and the protest against North Korea to release the Japanese abductees.

The song is not specifically about the Tohoku region, but the evoked bucolic landscape resonates with the popular imagination of the region as primarily rural, rich in agriculture and fisheries. As exemplified by this song, the emotionally charged Japanese word *furusato* specifically refers to the place of one's origin that is not urban (Tokyo or Osaka may be someone's hometown but not *furusato*). A childhood nostalgia that permeates this song further made it poignant as expression of loss and remembrance. The song is sung from the perspective of someone who left his pastoral home to

pursue success in bigger society. The memory of homeland is thus precious because he is no longer there. The sense of nostalgia is also increased by the quaintness of the old-fashioned Japanese, as it is an old schoolchildren's song that was published by the Ministry of Education in 1914.

It is possible that the vast destruction of coastal towns by the tsunami on March 11 was experienced on some level as loss of Japan's symbolic *furusato*. It is not only because these communities seem to fit the description of how *furusato* is characteristically imagined to look. It is also because these towns remind today's Japan of what it left behind in the process of urbanization and a decreasing emphasis on the primary sector of the economy. Many victims of the tsunami were elderly. According to the *Yomiuri Shimbun* from March 25, 65.1 percent of the dead were over 60 years old. This number reflects Japan's shrinking and aging population, a demographic tendency that is more acutely seen in the provinces due to migration of the younger working population. The percentage of the elderly (65 years and older) in Iwate, Miyagi, and Fukushima prefectures are on average around 25 percent of the overall population, which is higher than the average (but still high) 20 percent in urban and suburban prefectures. Like the protagonist in "*Furusato*," many of the "children" of these towns have left their ancestral home, and the likelihood of them returning to live in these places seems less than ever. The loss of *furusato* was most violently experienced by the evacuated residents of areas surrounding the Fukushima Daiichi plant, for whom the simple act of going back to their own house is barely possible at this point.

Another culturally encoded response to the earthquake was the media's emphasis on the restraint, the resilience and the humility of the local victims in enduring the crushing misfortune. While these characteristics were similarly admired in the overseas press as indicative of "Japan's" civilized response to the disaster, within Japan they were often more specifically assigned to the "special" characteristics of the people of the Tohoku region. The images of provincial victims quietly surviving with minimal shelter and sustenance were contrasted with the urban greed of those "selfishly" stocking up on food and water in Tokyo, coiled in fear of radiation that was not even there. The people from the Tohoku region have stereotypically been imagined as reserved, hardworking, frugal and rural; they are often imagined as "simple" farmers and fishermen who persevere despite

the harshness of snowy winter. Whether true or merely projected, the point in promoting this imagery of collective resilience seemed partly to console the victims by possibly appealing to their regional pride. In this respect, it is interesting that a representative from the city of Kobe, in a commentary published in the *Asahi Shimbun* on May 12, praised the great capacity of the Tohoku people for quiet endurance, but also gently admonished that right now is a time to speak up more.

Another cultural reference that was frequently evoked as expression of solidarity with the victims was a brief notebook entry by Miyazawa Kenji (1896-1933) that was posthumously made famous as "*Ame ni mo makezu* (not yielding to rain)":

Neither rain
nor wind
nor snow nor summer's heat
will affect his robust body.
Free of anger
and desire
he will always keep a calm smile.
A quart of brown rice, miso
and some vegetables will be his daily food.
In all things
he will not think of himself
but will observe, hear, and understand well
and will not forget.
Living in a small, reed-thatched hut
under pine trees in the field,
he will go to tend
a sick child in the east
or carry a bundle of rice plants
for a tired mother in the west
or try to dispel the fear of a dying man in the south
or stop a trivial quarrel or lawsuit
of people in the north.
He will shed tears if a drought comes

and trudge disconsolately if the summer is cold.
Called a bum by all
he will be praised by no one
and will bother no one.
I should like to become such a man.

The text extols the wisdom and courage of everyman who seeks to live in compassionate simplicity, a life ideal dreamed by one of modern Japan's most imaginative writers. The evocation of this literary reference was not surprising. Miyazawa Kenji is the most popular author from the Tohoku region, who also invented a utopia called "Ihatov" in one of his children's stories in homage to his native Iwate, and "*Ame ni mo makezu*" is one of the most recited pieces of modern Japanese poetry. If any kind of collective consolation was possible, beyond the stale platitude of *ganbare* (hang in there and keep on trying), it was perhaps offered by such poetry of humble and humane heroism that was rooted in the region.

VISUALIZING THE INVISIBLE

The aftermath of natural calamities such as the earthquake and the tsunami, however catastrophic, is in the end "representable." The human experience of natural disasters has been represented for centuries in Japanese culture, with a distinguished list of such accounts going as far back as the early-13th-century essay "*Hojoki*." How to represent the developing accident at the Fukushima Daiichi nuclear plant turned out to be far more difficult and controversial.

The opacity of this (still unresolved) accident was visually reinforced by the blurry aerial view of the damaged Fukushima plant taken from a distance, the single most shown image of the plant on TV for days following the accident, given that precise visual updates were unavailable. Staring at the several images of the damaged plant did not necessarily add to what the general public wanted to know about the accident, however. (But we got to know the cosmetic effort Tokyo Electric Power Co. made to integrate this site "naturally" into the surrounding landscape, upon seeing how the walls of buildings housing the reactors were painted in pastel sky blue with a scat-



This aerial view of Fukushima was the most-seen image of the quake's damage in the days immediately following the accident.

tering pattern of white patches.) What the viewers in the eastern half of Honshu wanted to "see" was not necessarily the physical damages made to various parts of the structure, but the implication of such damages for the invisible leakage of radioactive materials.

Controlling the circulation of information was the approach of the government in preventing the outbreak of a mass panic, the possibility of which felt real. Chief Cabinet Secretary Yukio Edano was often articulate yet inconclusive in his daily press conferences. He famously repeated that the hitherto released radioactive materials are not "immediately" (*tadachini*) dangerous to human health according to the data gathered "so far" (*ima-no-tokoro*). Yet in visual contradiction to the message of provisional reassurance, he and other top government officials appeared until April 1 in what is known as *bosai-fuku*," a "disaster-protective gear" that looks like a rescue worker's uniform or that of a utility company mechanic. The only rationale behind this fashion decision, their jobs being administrative, was to send a symbolic reminder to the public that we were in a state of hyper national



Prime Minister Naoto Kan addresses the nation on March 11 dressed in a rescue worker's uniform.

emergency. This sartorial gesture apparently backfired in the international context, as it was criticized for propagating the image of Japan as "unsafe" to the rest of the world.

Mainstream media followed the government's example in withholding diverging opinions so as not to "confuse" the public. For example, the NHK news closely reported on the Fukushima accident with the visual aid of a meticulously crafted diorama of the Daiichi plant. One was amazed by the speed with which they manufactured such a detailed miniature replica, but the information given did not live up to the appearance of detailed precision. It was essentially a repetition of what was officially released by the government. There was a clear refrain from going beyond the plain reporting of officially released facts to offer multiple interpretations, let alone conjectures or criticism.

In this context of widespread *jishuku* (self-restraint), or self-censorship, arose the controversy over the cover image of the March 28 issue of *AERA*. *AERA* is a reputable weekly newsmagazine published by the Asahi Shimbun Company. The cover of this issue featured a close-up face of a man wearing a radiation-protective suit and mask, with the headline in red stating that "Nuclear radiation is coming (*hoshano ga kuru*)," the implied destination being Tokyo. This cover was heavily criticized for being unnecessarily sensationalist, even if the actual content of the issue was not nearly as sensationalist as what the cover and the headlines might have suggested at first. The criticisms became rampant especially on the Internet such as on Twitter, blogs and the unreliable yet highly visible forum Ni-chan'neru.

As a result, *AERA*'s editor-in-chief was forced to apologize on Twitter, on the magazine's official website, and in the following week's issue itself. Another well-publicized aftermath was that the acclaimed and prolific playwright Noda Hideki resigned from the magazine in protest. Hideki explained his disappointment at the irresponsible sensationalism of *AERA* in his farewell contribution to the magazine in the April 4 issue.

Was this cover too sensationalist? True, there was no factual basis at that point or now in speculating that the Tokyo area would be exposed to an alarming quantity of radiation. Hideki's point is well-taken; responsible journalism should not indulge in conjecturing catastrophic scenarios that verge on false rumors, a powerful message coming from someone whose most recent play, *South (Minami e*), which premiered in February, explores this very issue. This cover was also done in a style different from the magazine's signature style that consists of a photographic portrait of the "person in focus" with a straightforward declaration of the featured topic. The cover of the April 25th issue was more typical in juxtaposing the cheerful portrait of the budding figure skater Murakami Kanako with the main headline of the issue, "Nuclear power plants and the Japanese."

And yet, the March 28 cover is hardly shocking when compared to its international counterparts, such as the cover of *Newsweek* from the same week with a far more tabloid-ish (though ironic) headline reading "Apocalypse now." Within Japan, a more overtly sensationalist treatment of Fukushima has been provided, for example, by the opposing and rival coverage between the two popular weeklies Gendai, published by Kodansha, and

Post, published by Shogakkan, which intensified in the course of April.

The *AERA* controversy was revealing of the fault line in popular Japanese sentiments regarding how one should approach the Fukushima accident at a time when confusion and anxiety dominated. Was it reasonable to expect the public "bravely" to endure the fear of uncertainty in trusting the good faith of the government? According to the poll published in the *Asahi Shimbun* on March 18, 73 percent of the people felt that the government's handling of the information regarding this accident was unsatisfactory. Very few informed predictions were published in the mainstream news media. At such a time, should the magazine be condemned for venturing out to do the guesswork of "worst-case scenario(s)" when many in Japan desperately wanted to know just that?

The March 28 issue of *AERA* was also a watershed in loosening the widespread practice of *jishuku* in the media. From the same week onward, a wider range of representations, including more-sensationalist pieces as mentioned above, began to appear in the popular media. This return to the business of mass journalism as usual was also anchored by the increasing perception that the situation in Fukushima was perhaps not going to take a dramatic turn for the drastically worse after all, but that it is going to drag on for a long time.

THE AMBIGUITY OF ECHOES

Some of the most resonant imagery that was aired on major network TV following the earthquake was a surprise in that it had nothing to do with the tsunami or with nuclear power. It is the so-called "Is this an echo (*kodama deshoka*)?" commercial run by the nonprofit Advertising Council Japan (Nihon Kokoku Kiko), known as AC. This commercial, made by Japan's largest advertising agency Dentsu, was launched last year as part of AC's region-specific advertising campaign for the Kanto and Koshin'etsu (Yamanashi, Nagano and Niigata) areas in 2010-2011. This commercial ended up capturing the general mood of empathy as well as disorientation that hovered over Japan's capital in the aftermath of the earthquake and in the wake of Fukushima, partly by design but ultimately for reasons entirely unrelated to the commercial's original purpose.

The quasi-narrative ad takes place in a generic urban residential setting in showing a sequence of scenes that feature elementary school children, alone and together: an older boy waits for a younger boy on their way back from school; a girl is sitting by herself as other children rush out of the classroom to go play in the schoolyard; a girl is approached by a boy who wants to reconcile after perhaps a small fight, and so on. The ad concludes with the image of shadows of two children, moving back and forth as they play on the swing side by side.

The words accompanying the imagery come from a poem by Kaneko Misuzu (1903-1930). She was an amateur children's poet, and the bulk of her unpublished writings became known only in the 1980s. Several of her poems, including this one, have become popular and are used in a few school textbooks. The poem's literal translation is:

If I say "let's play,"
it repeats "let's play."
If I say "you fool,"
it repeats "you fool."
If I say "I am not going to play anymore,"
it repeats "I am not going to play anymore."
Then, later,
when I get lonely,
if I say "I am sorry,"
it repeats "I am sorry."
Is this an echo?
*No, it may be anyone [*iie, daredemo*].*

The ad is not particularly memorable on its own. The sentimentalism is typical of many AC commercials, and up until March 11 it was just another example of the inoffensive and indistinguishable AC ads. How, then, did this commercial become so ingrained in the people's imagination after March 11?

The first reason is simply the television-viewing public's sheer exposure to this commercial. By late afternoon on March 11, all major networks, at least in the eastern half of Japan, replaced their regular programming with

exclusive coverage of the earthquake. In addition, virtually all corporate sponsors pulled off their advertisements in a gesture of *jishuku* so as not to appear self-serving and greedy during a time of national tragedy. As a result, the airtime that is usually given to corporate advertising was largely taken over by the public service commercials provided by AC. Sekine Tatsuo of CM Databank said in the April 21 issue of *Shukan Shincho* that 75 percent of the commercials aired on major network stations between March 11 and March 16 were by AC. The "Is this an echo?" commercial was one of the most frequently shown.

Advertising Council Japan is known especially for its coordination of widely circulated advertisements that are made to increase public awareness of a range of social issues. These issues can be specific, such as domestic violence, cervical cancer or leukemia, or more general and moralistic as in "treat the elderly with respect" or "conserve the ecosystem."

The "Is this an echo?" commercial is an example of the more general and moralistic kind, its overall message being "communication," according to AC's website. This advertisement promotes empathy as key to genuine human communication; people will react to you by "echoing" the way you act toward them. This message is symbolized by the last line of Kaneko's poem, "*iie, daredemo.*" A descriptive translation would be, "No, it is not an echo. This is how people communicate with one another."

The message reverberated with the universal sentiments of empathy for those who have been affected by the earthquake. The way the poem culminates with the phrase "I am sorry" also felt appropriate. It was furthermore somehow comforting that this sense of remorse was expressed with the innocuous softness of *yasashisa*, or gentle compassion, which is the dominant tone of the ad. The open-endedness of the poem's last line, "*iie, daredemo*," moreover resonated with the atmosphere of uncertainty at the time. The effect of this poetry rests entirely on this last line, yet the meaning of this simple but incomplete sentence is not immediately obvious.

Another, more visceral, reason why the "echo" commercial stuck in people's minds might be that its repetition reminded the viewer of the earthquake experience. Many viewers in eastern Honshu began to experience the repetition of words within this commercial, and the replaying of the same few commercials over and over again, as irritating. If these re-

actions sound a little hypersensitive, it must be understood in the context of constant aftershocks and the eerie outburst of bigger earthquakes after the initial magnitude-9 one, most notably the magnitude-6.7 earthquake in Nagano on March 12 and the magnitude-6.4 earthquake near Mt. Fuji on March 15. Symptoms described as "earthquake sickness (*jishin-yoi*)" — the sensation of continuously experiencing an earthquake even when there is none (similar to the lingering sensation that one is still flying after a long flight) — were widely reported. The hypersensitivity to the earthquake was so great that AC eventually had to remove the familiar, high-pitched utterance of "ey-shee (AC)" with which all of its advertisements conclude; viewers and listeners complained that the sound reminded them too much of the similarly high-pitched and jingle-like earthquake warning that went off frequently throughout March.

Finally, the "echo" commercial was made memorable for the many parodies it generated. It did not take long for them to appear. The most ingenious was made at the expense of Chief Cabinet Secretary Edano, who emerged as the face of the government in the wake of the Fukushima accident. A variation of this joke is recounted in the April 16 issue of the weekly *Shukan Gendai:*

If one asks "is it all right?" it repeats "it is all right." If one asks "is it not leaking?" it repeats "it is not leaking." If one asks "is it safe?" it repeats "it is safe." And then, later, when one gets worried and asks "but is it not in fact leaking a little?" it repeats "it is leaking a little." Is this an echo? No, it is Mr. Edano.

This joke brilliantly captured the public's frustration with the self-possessed, clearly spoken but evasive nature of Edano's responses that was typical of his daily press conferences regarding the Fukushima accident.

In Tokyo, mourning and anxiety were two common responses to the Great East Japan Earthquake. The genuine sense of loss was paradoxically demonstrated by the relative absence of the predictable "*ganbatte*" message of "Hang in there! Keep on trying!" "*Ganbare*" is typically uttered to console or cheer up someone in a difficult situation. After a decade of public-awareness campaigns by the clinical psychology community, we as residents of a country plagued by suicides and depression have learned *not* to say "*gan-*

bare" to people when they are in extreme distress. For how is one supposed to "*ganbaru*" when one has lost one's home, one's livelihood, one's family, relatives, friends, and just about everything that one possessed? The situation looked too devastating for this message to sound humane.

By mid-May, two months after the earthquake, Japanese society on the whole is anxious to move beyond the initial stage of mourning to something more constructive and restorative, or back to the familiar, while more than 100,000 evacuees continue their insecure existence in local gymnasiums or far away convention centers. The wave of "*Ganbare* Tohoku and Nippon!" has become more visible, from shop fronts decorated with posters of this message to the shiny smiles of celebrities and top athletes on TV. Popular reactions to the ongoing Fukushima accident are no longer dominated by panic, but have shifted to pointed anger towards TEPCO and criticisms against the national energy policy. Politicians and public intellectuals have begun talking about reinventing the Tohoku region and even Japan. We do not know how Japan will look a few years from now. The outcome of sustained collective responses to the Great East Japan Earthquake is yet to be seen.

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CHAPTER 4

The Economic Future: Can Japan Turn Crisis Into Opportunity?



CHERRY BLOSSOMS IN IWATE ON APRIL 20 (PHOTO BY YASUYOSHI CHIBA/AFP/GETTY IMAGES)

"Disaster — and it is a Japanese concept — creates space. Things are cracked open, and things can be put in motion."

— John Dower, professor of Japanese history at the Massachusetts Institute of Technology

Look Past Old Habits
by David Pilling

Shake Out of Stagnation
by Bill Emmott

Break Free of the Familiar
by Brad Glosserman

LOOK PAST OLD HABITS

BY DAVID PILLING

The pictograms that spell out *kiki*, the Japanese word for crisis, are "danger" and "opportunity." Perhaps more than any other nation, Japan has used its successive confrontations with crises as a catalyst for change.

One has only to think of the Meiji Restoration, sparked by the arrival near present-day Yokosuka of Commodore Matthew Perry's smoke-belching black ships. That threat set off one of the most rapid social and industrial transformations in human history. Perry brought with him an external threat, that of colonization by a foreign power. It was enough to galvanize a clique of young Meiji leaders to fight fire with fire: by transforming Japan into a modern, industrial state capable of repelling the barbarians from the gate.

After Japan's defeat in World War II, the country dramatically switched tack again. This time, it abandoned its tragic foray down the historical cul-de-sac of militarism and empire-building and concentrated instead on the business of becoming wealthy. That endeavor was spectacularly successful. What Japan had failed to demonstrate through conquest, it showed by peaceful means: A country of nonwhites could match, and often supersede, the achievements of Western nations. That had liberating consequences not only for Japan but for much of Southeast Asia and, eventually, for China itself.

The natural disasters to which Japan is all too vulnerable have also often had a steeling effect. Historians rightly remember the shameful vigilantism in the aftermath of the 1923 Great Kanto Earthquake that devastated Tokyo. As rumors spread that ethnic Koreans were starting fires and poi-

soning wells, sword-wielding thugs butchered several thousand innocent people. Less well remembered is the more uplifting response of rebuilding Tokyo from the ruins of an earthquake that killed 140,000 people, destroyed 570,000 homes and wiped out an estimated 29 percent of Japan's gross domestic product.

John Dower, a professor of Japanese history at the Massachusetts Institute of Technology, describes the energy and imagination that went into reconstructing — and reimagining — the Japanese capital. "The key phrase is the 'New Tokyo,' " he says, adding his hope that something similar may occur when it comes to rebuilding Tohoku. Tokyo was not just reconstructed but reinvented. "You've got the subway system, the transportation system. This is the period when department stores really flourish and café society blooms and parks are built. There's a real sense of 'Tokyo Modern': gas stations, movie theatres, dance halls."

Of course, history records that this sense of hope and rejuvenation was, in Dower's phrase, "devoured by militarism." The new city, built from the ruins of the 1923 earthquake, was destroyed once again, this time by the American firebombs that swept through its wooden structures, incinerating an estimated 100,000 people on the nights of March 9-10, 1945, alone. Yet once again, Tokyo — a city that had traditionally mocked its periodic conflagrations as the "flowers of Edo" — rose anew.

This sense that Japan has, many times before, confronted and overcome crisis is a powerful national talisman. It has raised in many the hope that, this time too, Japan can emerge fortified from calamity. Not only, say the optimists, will it recover economically, restore its energy supply and rebuild the destroyed towns, schools, roads and fishing fleets of Tohoku. More than this, it may use the opportunity born of crisis to reinvent itself once more: to awake from the supposed torpor of the past two "lost decades," to reinvigorate its tired political system, to put its public finances in order and to find a new, more vibrant, economic model. In crude terms, there is a hope that Japan will rediscover its mojo — *konjo* in Japanese — the dynamism that many feel has been lost in the post-bubble Heisei era.

Certainly, there is some precedent for this. As Dower says, "Disaster — and it is a Japanese concept — creates space. Things are cracked open, and things can be put in motion." Naoto Kan, the prime minister, seized on a

similar idea in a recent interview. "For the 20 years before this great earthquake disaster, our nation has seemed, in many ways, to be at an impasse," he told the *Financial Times*. "As we overcome the crisis created by this disaster, we must also overcome the preceding crisis, what could be called Japan's structural crisis."

If, indeed, the earthquake, tsunami and subsequent nuclear disaster of March 11 have cracked open an opportunity, what kind of structural changes might be set in motion? First, we will look at what the triple catastrophe revealed about the country, both good and bad. Using this as a basis, we will examine a number of areas — such as public finance, political structures and energy policy — in an attempt to discover what could change as a result of the 2011 shock.

In doing so, we must not forget that the earthquake of March 11 is by no means the only crisis shaping Japan. Since 1989, the year the certainties of the Cold War ended and Japan's bubble economy spectacularly imploded, the country has faced significant external and internal impetus to change. Greatest among these has been the rise of China, which has challenged Japan's manufacturing base and forced it to reconsider the security stance it has maintained since the end of World War II. Internally, Japan has had to cope with an aging population, a shrinking workforce and the seemingly endless deflation that is arguably a reflection of its own policy failures. It is also had to cope with success: the success of catching up with the living standards of most Western countries and the lack of momentum that often accompanies economic maturity.

Historians have recently shown that, in the late Tokugawa years, Japan was not the unchanging and dark feudalistic society of repute. Rather it was struggling with internal tensions and alive with intellectual ferment. History will judge the past 20 years in similar fashion. Far from drifting helplessly — as is commonly thought — Japanese society, industry and government have undergone a wrenching dislocation. Nor, in the post-Lehman world, does Japan's economy look all the more dysfunctional than that of the United States and Europe, the former struggling with high unemployment and huge twin deficits, the latter with budget cuts and the possible default of some of its members. If Japan is able to use the earthquake of March 2011 as a catalyst for change, it will be change built on two decades of rarely

acknowledged adaptation, experimentation and creative tension.

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Four days after a 9.0-magnitude earthquake shook the sea bed off the coast of Miyagi, unleashing a tsunami with waves up to 100 feet, Kaoru Yosano, economic and fiscal policy minister, sat in his office in Nagatacho. Aftershocks continued to rattle the old building, considered one of the least earthquake-resistant government offices in central Tokyo. Each time the edifice groaned and creaked with the latest aftershock, conversation would come to a halt and Yosano's aides would look anxiously at the ceiling. The 72-year-old minister, recently recovered from throat cancer, invariably used the lull to light a fresh cigarette.

At the time, Yosano, though clearly shaken, professed to be fairly confident that economic damage from the earthquake could be contained. In an interview, he said that Miyagi, Iwate and Fukushima, the three worst-affected prefectures, accounted for only 4.1 percent of Japan's output. Even if one-third of their economic capacity had been destroyed, he reasoned, that would represent a loss of gross domestic product (GDP) of around 1.2 percent. Moreover, spending on reconstruction would compensate for the loss of output. Growth could thus plausibly end up higher than the 1.5 percent originally forecast. "It is far from what is being reported that the Japanese economy is in a miserable state," he said. For basic industries, such as car and electronics manufacturers, he predicted that "the effect of this disaster will be quite limited."

That assessment, admittedly made in the immediate aftermath of the catastrophe, has turned out to be too optimistic. In the first quarter of this year, most of which came before March 11, the economy shrank 0.9 percent in comparison to the previous three months, an annualized decline of 3.7 percent. Consensus forecasts now have the economy growing by about 0.4 percent this fiscal year, one-quarter the rate of prequake expectations.

There are three interrelated reasons for the bigger-than-expected economic impact. First, the Tohoku region turns out to have been more integrated into the manufacturing supply chain than anyone had realized. That may tell us as much about lean manufacturing, just-in-time parts delivery

and supply-chain specialization as it does about Tohoku itself. Far from being merely a region of fisheries and agriculture, as many Japanese had assumed, the country's northeast is deeply embedded in Japan's industrial base.

Renesas Electronics's factory 70 miles northeast of Tokyo supplies 40 percent of the world market for car microcontrollers, a crucial component often described as the brain of the modern car. When production at the plant stopped, the big carmakers sent hundreds of technicians north in a desperate attempt to get production started as quickly as possible. Renesas, which is 90 percent owned by Hitachi, Mitsubishi Electric and NEC, is one of dozens, if not hundreds, of component suppliers whose production problems sent aftershocks throughout Japanese industry and beyond. In the aftermath of the earthquake, Japanese car production slumped to half its normal levels. Toyota said it faced shortages of 150 parts, from electronic controllers to paint additives. In the three months to April, Japan's vehicle exports fell a catastrophic 67 percent. Overall shipments abroad dropped 12.5 percent, pushing Japan — dependent on a trade surplus for much of its growth — into a trade deficit of $5.7 billion.

The concern goes deeper than the latest quarter. In the United States, for example, South Korean companies, helped further by a weak won, have picked up market share from their struggling Japanese rivals in the aftermath of the quake. Once ceded, it will not be easy for Japanese companies to regain their position. In addition, there is a strong incentive for Japanese companies to shift production out of Tohoku or out of Japan altogether. Few will advertise such moves. But economic imperative may mean they have little choice. Again, it will be difficult to bring jobs and production lost to foreign-based factories back to Japan.

Second, the catastrophe also revealed just how dependent Japan was on power produced in the Tohoku region generally and on nuclear power in particular. Tokyo Electric Power Co. (TEPCO), the company that operates the stricken Fukushima Daiichi nuclear power plant, alone supplies 29 percent of Japan's electricity to more than 2 million businesses. Companies are being asked to reduce their electricity use as the hot summer months approach, a request that will have a further dampening effect on economic activity. TEPCO made a $15 billion loss in the first quarter, the largest ever

for a nonfinancial Japanese company. One consequence of the crisis will be to force a decision about how to treat the entity: break it up, allow it to go bankrupt or keep it going with taxpayers' money. Controversy surrounding TEPCO (about which more later) could force a noisy debate that would draw the Japanese public into a discussion many once regarded as too technical or opaque.

Finally, and harder to measure, is the psychological impact on the economy of the earthquake, radiation scares and continual aftershocks. Shintaro Ishihara, the Tokyo governor who initially described the natural catastrophe as heavenly retribution for Japanese egoism, has led a campaign of *jishuku*, or restraint. The power on normally blinding vending machines has been turned low. When cherry blossoms made their fleeting appearance in April, the governor urged Tokyoites to abandon the practice of holding sake-lubricated celebrations. The Japanese — despite the countervailing urgings of other politicians to spend money as normal — appear to have taken such messages to heart. Most measures of consumer demand have fallen sharply.

Such restraint may turn out to be temporary. But there is already talk about Japan needing to lower its living standards and eschew the wasteful lifestyle that characterizes many developed economies. In an interview, former prime minister Morihiro Hosokawa echoed such thinking. "Perhaps we will realize we have been living an overly luxurious life. We can learn from this and go back to a more modest way of living without so much luxury," he said. "For example, we change our car model every year, or change our TV model. Everyone wants to have the latest version. This is pretty nonsensical." Many environmentalists — and even some economists — may applaud that view, though it is quite a leap from there to actually changing the habits of a nation. But if such ideas really do catch on, they would exacerbate the tendency of recent years toward anemic economic growth.

If the earthquake and tsunami brought home the fragility of the Japanese economy, there was a silver lining. With so much talk of Japan's economic decline in recent years — both abroad and in Japan itself — many had forgotten its continued global importance. Not only did a disruption to the supply chain hit Japanese production. General Motors was among the first companies to acknowledge the impact of parts shortages, halting production halfway round the world in its Louisiana plant. For the first time in a

decade, members of the Group of Seven nations took coordinated action on the currency markets to halt the alarming rise in the yen. Perhaps for the first time since China surpassed Japan as the world's second-biggest economy a few years ago, many people thought about the obvious corollary: Japan's economy is roughly the same size as China's — and bigger than that of Britain and France combined.

Outside the purely economic sphere, the tragic events of March 11 revealed much else. Misako Kaji, a deputy director-general at the foreign ministry, was one of many to comment on the support Japan received from no fewer than 140 countries. After the Kobe earthquake of 1995, outside offers of help were sometimes spurned. European rescue dogs were famously quarantined while Kobe residents picked through the rubble by hand. This time Japan was less defensive about accepting international assistance. The foreign ministry dispatched translators to help teams from Turkey, South Africa and elsewhere operate on the ground. Sadako Ogata, president of the Japan International Co-operation Agency, says she hopes the experience, including the historic participation of a rescue team from China, will help Japan learn to live more comfortably with its neighbors.

Indeed, when postquake discussions were held in the Diet about budget cuts, many parliamentarians spoke out against slicing overseas development aid — which has been declining for the best part of a decade — on the grounds that Japan's contributions have brought it much good will. Some Japanese have expressed the hope that this "rediscovery" of Japan's place in the world may help to counter an inward-looking tendency of recent years. Japanese students enrolled in American universities, for example, are now easily outnumbered by counterparts from China and South Korea, and Japan continues to rank poorly in international tables of English proficiency. Few believe that Japan is best served by withdrawing from the world.

Kan, though criticized for his handling of the crisis in many respects, has generally been praised for his swift decision to dispatch tens of thousands of troops from the Self-Defense Forces, the equivalent of the armed forces under Japan's pacifist constitution. This decision contrasted with 1995, when there was much hesitation about dispatching men in uniform because of a lingering mistrust of the military. Similarly, the nongovernmental organizations that had their birth in the Kobe disaster — in what was then seen as

an early flowering of ground-up civic activity — played a bigger role this time around. One has only to think of the U.S. government response to the Katrina hurricane of 2005 to realize how much worse Japan's rescue operation could have been.

Matthew Penney, an assistant professor at Concordia University in Montreal, says: "The government recognized the seriousness of the situation much more quickly [than in Kobe], and the fast dispatch of rescue teams and the Self-Defense Force, as well as coordination with international aid teams and the U.S. military, resulted in lives being saved. The response was not perfect, and there are many stories of red tape and bad decisions. But given the extent of the devastation, Japan's official structures coped well at all levels."

Far more problematic was what the crisis revealed about Japan's nuclear industry. When the earthquake struck, the Fukushima Daiichi plant did shut down automatically as it was supposed to. But little serious thought appears to have been given to protecting the plant from a tsunami of the size that swiftly followed. As recently as June 2009, Yukinobu Okamura, a prominent seismologist, had warned that the northeast coast around Fukushima had a history of much larger tsunamis than TEPCO had planned for. Like many such warnings, Okamura's was dismissed by an industry with a record of arrogance and obfuscation.

In the event, the company's 5.5-meter seafront barriers were no match for the 14-meter tsunami that swept ashore roughly an hour after the quake. Diesel generators located on the seaward side of the plant were flooded, knocking out the cooling system designed to prevent uranium fuel rods from overheating.

That poor planning was partly a result of the overly cozy relationship between TEPCO and nuclear regulators at the trade ministry. The ministry had for decades been a strong advocate of nuclear power as a solution to Japan's dependence on foreign oil and gas. Regulator and regulated have thus often found themselves on the same side, minimizing safety concerns and persuading the public to accept more power stations. That collusion may have been exacerbated by Japan's *amakudari* system, in which government officials "descend from heaven" into cushy industry jobs. (Such a system is hardly unique to Japan, though. In the United States, the relationship is

arguably even more incestuous, with officials moving more or less freely between government and industry.)

Whatever the underlying causes, Japan's nuclear industry has a shocking record of contravening safety standards and covering up scandal. In 1995, the extent of an accident at the Monju fast-breeder reactor was hushed up. Four years later, two workers died at the Tokaimura reactor after blatant disregard of safety procedures led to a large quantity of uranium reaching critical mass in a bucket. Then in 2002, TEPCO was found to have falsified data on 29 occasions relating to cracks in its reactors. After a 2007 6.8-magnitude earthquake, TEPCO admitted that the affected Kashiwazaki plant had not been designed to withstand a tremor of anything like that force. Nor had it known that the facility sat so close to a fault line. The history of collusion and complacency tends to support the idea that Japan remains an overly top-down society in which bureaucrats, industry leaders and politicians have been expected to solve the nation's problems behind closed doors.

These are some of the aspects of today's Japan that were cracked open by the triple catastrophe of March 11. What, to borrow Dower's phrase, could be set in motion as a result?

One area that people are looking at is public finance. In the short term, the need to fund reconstruction work in Tohoku could exacerbate what many economists already consider to be the parlous state of Japanese finances. The taxes collected by the government now account for less than half of expenditure, a position that will worsen if nominal growth continues to stagnate and welfare spending rises. As it is, gross public debt is roughly 200 percent of Japan's GDP, the worst of any advanced nation.

Takatoshi Ito, professor of economics at Tokyo University and formerly a member of the cabinet's Council on Fiscal and Economic Policy, argues that this is unsustainable. He has gathered signatures from economists supporting the view that, instead of issuing more bonds to fund reconstruction, the government should implement a long-discussed rise in the sales tax, currently just 5 percent. "Issuing bonds means you just shift the burden to the next generation," he says. "In the next 10 years, 10 percent of the working population will retire, including myself. So if they issue bonds redeemed in 10 years, we won't pay. But if they raise consumption tax next April, we'll be glad to pay."

Polls conducted shortly after the earthquake suggested that a majority of Japanese supported a higher consumption tax, though there is some indication that enthusiasm has waned as the immediate crisis has passed. But administrations have tried to raise the consumption tax before and come unstuck. Ryutaro Hashimoto famously increased the tax from 3 percent to 5 percent in 1997. Coincidentally or not, the economy slammed into recession in the following year and Hashimoto's administration was finished. Even the redoubtable Junichiro Koizumi, whose six-year premiership was characterized by bold leadership, balked at raising the sales tax. He too feared that an increase, rather than improving the economy, would stifle spending. Kan campaigned for higher taxes in the upper-house election of 2010. For that and other reasons, his party was roundly beaten. The prime minister has been noticeably quiet on the subject since the earthquake. If Ito and others expect him to jump on the crisis to push through an increase, they may be disappointed.

But the hesitation to raise taxes does not merely signal a lack of political will. Just as much, it reflects a genuine debate over economic policy that has never been properly resolved. Some economists argue that an increase in the sales tax is the last way to stimulate the economy. Far from repairing the deficit, they argue, tax revenue could actually fall. Just as there are strong advocates for fiscal consolidation, so there are those convinced that deflation lies at the heart of Japan's economic difficulties. According to this argument, Japan's gross debt has ballooned as a proportion of GDP because nominal GDP has remained almost stagnant. In real terms, accounting for deflation, economic growth has not been nearly so bad — in fact similar on a per capita basis to that of the United States over the past decade. But deflation has held the size of the economy back in nominal terms, making debt proportionally bigger.

Those who blame deflation for Japan's economic ills criticize the Bank of Japan (BoJ) for failing in its remit. From around 2002, the central bank pioneered quantitative easing, an unconventional policy used only when short-term interest rates are already at zero. But critics say it did so too half-heartedly to have a decisive impact. Paul Sheard, chief economist at Nomura, argues that the BoJ should now significantly step up its purchase of Japanese government bonds (JGBs), a policy that would, he says, have the

dual benefit of funding reconstruction and reflating the economy.

Peter Tasker, a founding partner of Arcus Investments, points out that 10-year bond yields are close to historic lows — at about 1.4 percent — an indication the market thinks talk of default is overdone. In addition to low interest rates, the Japanese government is partially shielded from default by the fact that 95 percent of debt is held domestically. There are no foreign bondholders itching to pull the plug. Tasker suggests the government float 100-year bonds or even bonds with no maturity. Some Japanese politicians think along similar lines. Last April, 130 members of the Diet moved to impose an inflation target on the BoJ. Their campaign petered out amidst criticism that it would compromise the central bank's independence.

The point of rehearsing this debate is to underline that crisis can only galvanize a response if there is a consensus about what should be done. Alternatively, one needs leaders willing to go out on a limb, to impose policies that go against the grain. Part of Japan's drift in fiscal policy results from the fact that there are genuine differences about the best way forward. To choose one path entails risk, political as well as economic. The earthquake of March 11 may not break the deadlock.

A second area of potential flux surrounds the discussion of how to rebuild Tohoku. Many argue that it would be foolish simply to restore the region to the status quo ante. Tohoku was not only more vulnerable to tsunamis than many had previously thought. It was already one of Japan's poorer regions: Of 47 prefectures, Miyagi was the 32nd poorest and Iwate the 39th. Many farmers are elderly, and younger people have drifted to the big cities.

Ito of Tokyo University says one possibility is to build so-called compact cities that are more efficient to run. Another idea being pushed, including by Yoshihiro Murai, governor of Miyagi, is to make Tohoku a special economic zone. The idea would be to hand over more authority to the region, which could then offer incentives — tax and otherwise — to encourage Japanese and foreign businesses to invest. Koizumi dabbled with such policies during his administration, but, for the most part, they failed to take off.

Gerry Curtis, a Japan expert at Columbia University, advocates an overhaul of farming laws, which restrict the entry of corporations. "If you had a liberalization of agriculture and fisheries and made it possible for people to get together in a larger corporate framework, you may be able to get some-

thing going," he says. That could conceivably provide a model for the rest of Japan.

Energy policy is a third area up for grabs. Here, the government has taken quite decisive action although not as decisive as Germany, where Chancellor Angela Merkel responded to the Fukushima disaster by announcing the closure of all 17 of the country's nuclear power plants. In May, Kan called on Chubu Electric Power to shut down the Hamaoka nuclear plant in Shizuoka prefecture, considered the most dangerous because it sits directly on top of a major fault line. He also urged "fundamental reform" of nuclear regulation. "The supervisory body and the administration advancing nuclear power both exist in the same office," he said. Potentially more radical still, the prime minister abandoned a previous energy plan that had called for relying on nuclear power for up to half of electricity generation by 2030. That would have required the construction of 18 new reactors in addition to the 54 already constructed. The government would instead build a new energy plan from scratch.

Dower sees a big chance to reposition Japan at the cutting edge of renewable-energy technology. "They have been so focused on nuclear energy, which would become 40 percent, 50 percent, 60 percent of their energy source, that they weren't really moving to see themselves as a pioneer of alternative energies," he says. "But that's precisely where Japanese talent, innovation and creativity should be directed. This is an opportunity. Will these ideas be squelched because of the entrenched, gridlocked system? All I can say is I don't know."

Of course, there are real doubts about the feasibility of any modern economy powering itself by alternative energy alone. Short of major technological breakthroughs, scaling back nuclear power may simply mean an increase in carbon emissions from oil- or coal-fired power stations. Alternatively, Japan could learn to live with a lower generating capacity, an outcome that would probably restrict its ability to grow. Just as likely, advocates of nuclear technology will quietly reassert their position. Even so, they will have to pay greater attention to transparency and minimizing risk if they are to carry the public along with them.

Finally, could the way politics itself is conducted change as a result of natural disaster? Japan has been in an excruciatingly lengthy political tran-

sition since 1993 when the Liberal Democratic Party (LDP) first lost power, albeit briefly. That marked the first crack in the political edifice known as the 1955 System, through which the LDP had used increasing national prosperity and pork-barrel politics to perpetuate power.

The crumbling of that system largely reflected the economic changes the country was undergoing: The era of economic catch-up was over, and Japan's bubble had burst. The money to keep the electoral machine greased was running thin. It took until 2008 for the 1995 System finally to collapse with the election of the Democratic Party of Japan (DPJ). But under the ineffectual Yukio Hatoyama and now Kan, the DPJ has failed to establish anything radically new.

Certainly, Japan has not been able to create what many commentators hope for: a clear two-party system in which the public gets to choose between competing ideologies. Nor is the DPJ's struggle to wrest control from the bureaucrats properly resolved. Indeed, Japan seems to have the worst of both worlds: a demoralized bureaucracy and a political class without the technical capacity to lead.

The result is that some of Japan's most intractable problems continue to be fudged. To cite one example, does Japan want low taxes or a high level of welfare provision? At the moment it has Swedish-style provision with American-style taxes, an untenable proposition that helps explain its chronic budget deficits. To cite another, how is Japan to reconcile itself to a rising China? Some advocate clinging still closer to America; others argue that Japan needs to forge a different kind of relationship with both the U.S. and China.

Can crisis propel Japan to create a clearer political framework capable of answering these and other questions? The immediate omens are not promising. Many feel that the momentum has already been lost and the sense of crisis, at least in Tokyo, is already dissipating. "There was a collective psyche in the aftermath, a rare phenomenon," says Taniguchi of the weeks following March 11. "But Kan and others failed badly. They failed to take advantage. It is still there, but it is unraveling."

After a brief moment of rallying together, the Diet too is now as divided as ever. Few expect Kan to survive long, but no truly promising leader waits in the wings. Talk of a grand coalition — the last solace of the desperate —

has surfaced again. "There is a race against time to do something dramatic," says Curtis. "But I don't get the idea that this government is up to it."

In the area of political realignment, then, the shock of March 11 may not be enough to galvanize instant change. In other areas too, the response is likely to be more ponderous and contradictory than some may wish for. But it is worth casting one's mind back to Meiji, arguably the most dramatic transformation in Japan's modern history. Even then, it took 15 years from the time of the arrival of Perry's black ships for the Meiji Restoration to take shape. Nor did the strongest impetus for change come from the incumbent leaders. Indeed, Ieyoshi Tokugawa, the shogun, took to his bed when Perry menaced offshore, just as Masataka Shimuzu, TEPCO's president, disappeared from sight in the days after the tsunami. That did not mean change would never come, merely that it would originate in unexpected quarters and take time to bubble to the surface.

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SHAKE OUT OF STAGNATION

BY BILL EMMOTT

At first sight, the economic implications of the March 11 catastrophe are simple. With factories, shops, hotels, ports and other productive assets destroyed and with their employees out of work, the country's output and spending during the months following the tsunami has declined. Disruption to infrastructure has made things worse, especially shortages of electricity, as have supply-chain problems for some key components, but these shortages and problems will last only a few months. Relief efforts and spending are mitigating that effect in the short term, but then reconstruction and the reopening of productive assets will boost economic activity sharply, starting as soon as summer and lasting as long as the reconstruction takes.

The simple story is what happened when the 1995 earthquake in Kobe destroyed roughly 2 percent of Japan's gross domestic product (GDP), and it is what happened in the United States in 2005 after Hurricane Katrina. Economic statistics bounce back more quickly than do people's lives, especially the lives of those who have lost loved ones and homes. In rich, developed countries, natural disasters are generally temporary interruptions to economic trends, not causes of permanent discontinuities. They are profound human and scientific stories but not profound economic events. Afterward, economic historians rate other events — oil price shocks, wars, bursting financial bubbles, significant technological change — as having longer-lasting effects than do natural disasters.

In Japan's case, however, there are some big complications to this simple picture. The biggest is the question of how a country that already is bearing a gross public debt equivalent to 200 percent of GDP, by far the highest

ratio in the developed world, can finance the public spending necessary for reconstruction. Or, rather, how will Japan's decisions about how to finance it affect the course of economic progress during the next decade?

A second complication arises from the Fukushima Daiichi nuclear power complex, the scene after the tsunami of the world's worst nuclear accident since Chernobyl in Ukraine in 1986. The nuclear accident adds directly to the reconstruction costs, as local residents and companies that have had to be evacuated from a 20-kilometer zone around the plant will have to be compensated, a task that should fall to the Tokyo Electric Power Co. (TEPCO), which operates the plant, but cannot as TEPCO would then be bankrupt. TEPCO's troubles are thus forcing extra costs on to the government and on banks that may have to forgive loans to the electricity giant. The accident also is forcing a reconsideration of the safety of Japan's other nuclear power plants, which together provided 29.8 percent of the country's electricity supply in 2010, and, more profoundly, a reconsideration of investment plans in nuclear power and in other sources of electric power, such as gas, oil and renewables.

Such a rethinking of the country's energy supply will take time but also, quite probably, add in both the short and long terms to the costs of consumers of electricity, including both businesses and households. If so, that will serve to divert household spending away from other goods and services and make business operations in Japan less competitive. This could contribute to a third complication: the possibility that companies, especially Japanese manufacturers, might decide to transfer more of their production overseas, from Tohoku and even from Japan as a whole. The shortage of parts in the auto and consumer electronics industries worldwide that resulted from tsunami damage to small and medium-sized specialized producers in the Tohoku region will lead buyers of those components to reconsider whether their supply chains need to be more diversified to reduce the risk of future disruptions. Signs of a further "Japan premium" in terms of higher costs and risks could accelerate this process and make it harder to persuade companies to reinvest in Tohoku.

All of these three complications, however, lead to a fourth, which has the chance to mitigate or even neutralize the negative ones. It is that the sheer size of reconstruction, the financing difficulties, the further loss of

competitiveness, is reviving debate about the need for broader, pro-growth reforms, whether of a liberalizing nature or in the form of new types of government intervention. This debate has been proceeding in fits and starts for more than a decade in response to the country's low economic growth rate and the inevitable burdens of an aging population but essentially ceased when the end of the liberalizing Koizumi administration of 2001-06 was perceived as having been responsible for a big increase in inequality and even poverty, leading to its reforms being labeled and denigrated as "market fundamentalism." The landslide victory in the Lower House election in 2009 of the Democratic Party of Japan (DPJ), a party dedicated to reducing inequality and increasing public spending on welfare, effectively put the debate into the deep freeze.

A national crisis, however, is capable of unplugging that deep freeze and of destroying old assumptions and labels. There is no guarantee that it will do so, especially as the first months following March 11 have been characterized by political chaos and a dispiritingly quick return to self-serving political gamesmanship. But the voices for returning to broad economic reforms are there and could yet even penetrate the deafer zones of politics.

Let's put it another way: There is a chance that the aftermath of March 11 could prove a real turning point in Japanese economic policy, finally propelling the country out of its post-bubble stagnation. It is far from inevitable that this will occur, and making it do so would be far from easy. But there is a chance that it will. That chance is arguably the most intriguing aspect of the economic consequences of this disaster.

Dimensions and designs

Those are the complications that make the economic outcome of March 11 a lot more uncertain than for previous natural disasters in Western countries. The biggest immediate difference, from the 1995 Kobe quake, Hurricane Katrina in 2005 and the L'Aquila earthquake in Italy in 2009, is the sheer scale of the damage and of the implications. Anyone who visits the tsunami zone cannot avoid sensing the scale of what has happened, especially when looking at a map and seeing how large an area of the Tohoku coastline was devastated.

To get an idea of the size of the problem in economic rather than geographical or human terms, I visited Kaoru Yosano, one of Japan's most experienced economic policymakers. A minister of finance in Liberal Democratic Party (LDP) governments, he is now an independent member of the Diet and is serving as minister of state for economic policy in the DPJ administration of Naoto Kan. As Yosano explained, superficially, in the economic statistics, the task looks more limited than it really is. The affected prefectures account for 4 percent of GDP, which is double that of the (quite small) area of Hyogo prefecture damaged in the 1995 quake, but the actual direct damage to the productive capacity of the prefectures is only one-third of that 4 percent.

However, that figure fails to take full account of the damage to public infrastructure (roads, harbors, railways), some of which are indirectly productive rather than directly so, and of the cost of the compensation due from TEPCO to local residents — not to mention the potential implications of any actual bankruptcy of the power company. Nor does it include public works in other areas of Japan that the tsunami could now make essential: By overwhelming the defenses that were in place along the Tohoku coast, the tsunami has made it essential that other vulnerable areas of the country should also review their defenses and, where necessary, strengthen them urgently. The Tokyo-Yokohama conurbation, home to 40 million people and responsible for a third of the country's annual GDP, is a prime candidate for such a review.

Yosano's ministry's early assessment of the total loss of public infrastructure, buildings and public utilities was between Y16 trillion and Y25 trillion, compared with a total loss in the 1995 quake of Y10 trillion. But by early April, when I met him, he and his ministry believed that the true total loss would prove to be well over Y50 trillion. That is roughly 10 percent of the country's total GDP in 2010. It would not be surprising if even this figure were to prove an underestimate.

Following the 1995 earthquake, government reconstruction spending during the next five years amounted to Y5 trillion. Private investment made up the rest of the loss. If that same model can be applied this time, with extra public spending equal to about half the total loss, then the equivalent in 2011-16 would be roughly Y25 trillion, or 5 percent of GDP over those

five years. Quite possibly, however, it will end up needing to be a lot more than that once radiation compensation and the strengthening of tsunami defenses elsewhere in Japan are added in.

How to finance it? The obvious answer is to borrow the money, on the basis that the Japanese government's borrowing costs are remarkably low, that the new infrastructure and productive assets will earn a return higher than those borrowing costs and that the economic stimulus from reconstruction will generate rising tax revenues. But, as already noted, with gross public debt forecast to pass 200 percent of GDP this year even before the tsunami, and with the government's budget deficit as high as 8.9 percent of GDP in both 2009 and 2010, there is a strong lobby, both inside and outside Japan, arguing that some or all of the spending should instead be financed by higher taxes.

Opinion polls suggest a clear majority of Japanese are willing to pay higher taxes for the reconstruction. The Organisation for Economic Co-operation and Development (OECD), in its two-yearly Economic Survey of Japan that was released on April 17, 2011, endorsed this approach, recommending that reconstruction be financed by shifting spending from other areas and by raising taxes. Its chief recommendation is one that has long been close to Yosano's heart: raising the consumption tax.

On the Paris-based official international think tank's analysis, even without March 11, Japan's public debts were reaching a critical point. The OECD says that just to stabilize the ratio between debt and GDP would require that Japan run a primary budget surplus — in other words, a surplus of revenues over expenditures excluding the cost of paying interest to service the debt — of 3 percent of GDP. To finance that shift to primary surplus using a hike in the consumption tax from its current 5 percent would require that tax rate to be raised by somewhere between 11 and 15 percentage points, bringing it toward the 20 percent typical in Western Europe for consumption taxes (in its case, value-added taxes). In the OECD's view, the post-tsunami reconstruction costs mean that the rise in the consumption tax needs to happen even sooner than it had thought before March 11.

If the opinion polls are to be believed, there is a good political opportunity for this to happen. The government could implement a tax increase without fearing it would be punished by the electors. But there is a problem

with this argument. It is that to raise taxes sharply just when the economy is weak could cause a new recession or make any economic recovery anaemically slow — with the result that despite higher tax rates, actual tax receipts might not rise very much, if at all.

This is especially worrying in the context of the initial response by households to the disaster. Shocked, reminded of risks to their lives and incomes that are both natural and economic, and conscious of the case for self-restraint in sympathy to the victims of the tsunami, households immediately cut their consumption, worsening the drop in GDP during the following two months. Moreover, a political willingness to accept higher taxes does not mean that the effects on consumer spending of a tax hike would be any less: If consumption tax is doubled to 10 percent or more, consumers will automatically have less money to spend on goods and services. With Japan's household savings rate already in the low single digits, lower now even than in the United States, there is little room for households to maneuver unless their incomes rise (which is unlikely) or they decide to go into debt (also unlikely).

Another side of this argument says that, because of this fear of recession, reconstruction spending should be financed by borrowing, at least in the first year or so, and that that borrowing could be facilitated by direct purchases by the Bank of Japan of government bonds. Put into common language, this would mean that the central bank would be printing the money to finance the rebuilding. The Bank of Japan is likely to resist this, fiercely, both to assert its independence and for fear of inflation. And, although Japan has in recent years been characterized by falling prices, or deflation, rather than inflation, the risk of inflation as a result of this crisis is genuine. Some of the excess productive capacity that causes deflation has been destroyed, and rising energy and commodity prices have been pushing up costs for producers and consumers alike. If this trend became combined with a falling yen (which acts like a monetary expansion, boosting prices) and with the aggressive printing of money by the central bank, inflation could take off. If so, the consequences would be disastrous, for the government-bond market would likely collapse, with bond yields jumping and thus the government's borrowing costs jumping too.

So the Japanese government is caught in a vice. Raising taxes to pay for

reconstruction risks causing an economic contraction. Borrowing more, and financing it by printing money, risks inflation, which could also bring economic growth to a halt.

The result is likely to be some sort of compromise. Most of the initial spending on reconstruction will be financed by borrowing, without purchases of government bonds by the Bank of Japan, and the consumption tax will be raised, but only modestly at first. Quite possibly, a plan will be announced for further rises in the consumption tax in the coming years, although the potential for a Lower House general election may obstruct this.

A GREAT REFORM PROGRAM?

It is from this financing vice that the argument for a broader economic reform effort emerges. It does so for two main reasons. The first is that if a large amount of the reconstruction spending does have to be financed by borrowing, and if it is impossible to stabilize the debt-to-GDP ratio in the near term, then a good way to persuade investors to carry on buying government bonds at low yields would be to persuade them that the country's economic growth rate is destined to increase thanks to a reform program.

The second is that long-term demographic and economic trends are already weighing on growth and on the minds of bond investors: By 2020 the working-age population of Japan will fall by 10 percent. With a potential annual growth rate estimated even by the government at only 0.5-1.0 percent a year, and with productivity growth in industry having stagnated at a mere 1 percent annually for the past decade or so, the prospects for an unreformed Japan look poor. An unreformed Japan burdened by a hike in the consumption tax from 5 percent to 20 percent would have an even bleaker outlook. Moreover, for any government announcing a plan to raise taxes, it is appealing to sweeten the pill with a big dose of optimism, with a vision of how the country might be better able to absorb such burdens in the future.

That is the case for revitalizing the process of reform. As always, the OECD has laid out in its annual survey a comprehensive menu for reform, including measures to increase the amount of competition in the economy, to make it easier to start new businesses (Japan ranks 98th out of 183 countries in the World Bank's latest review of the ease of starting businesses), to

open up cartelized and highly regulated sectors and, most important of all, to reform the country's labor laws to make the labor market more flexible while providing security to workers. Japan's universities and research institutes are also a vital target, as so few are presently world-class, a fact that sits painfully alongside the constant mantra of seeking to encourage innovation in a "knowledge economy."

Whether any of such a program happens depends on politics and on resistance from interest groups. There is no doubt that experienced figures such as Yosano are in favor of it. As he said, Japan's experience during the 1990s showed that to rely on "creating effective demand through public works spending is useless." That will occur thanks to the reconstruction spending, but its effect will be short-lived: It will do little or nothing to raise productivity growth or boost the long-term potential of the economy. To do that requires a willingness, as he said, "to rationalize the inefficient part of the economy" — which is where boosting competition comes in, along with deregulating many service sectors. It needs "Schumpeterian innovation," by which he means accepting "creative destruction," accepting that old defunct businesses and sectors need to close to make way for new ones.

There is little doubt that in technical terms the reconstruction plans will be creative — finding new ways to design communities in disaster-prone areas to make them both viable and better protected. But whether the destruction caused on March 11 can and will prove creative on a national scale, permitting bureaucratic and corporate resistances to liberalization to be overcome and making possible a new flowering of Japanese entrepreneurship and innovation, we cannot yet know. We have to watch the process with fascination and more than a little hope.

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BREAK FREE OF THE FAMILIAR

BY BRAD GLOSSERMAN

Japan will rebuild; of that there is no doubt. The immediate challenges posed by the triple tragedy of March 11 are well within Japan's capacity to overcome. The country has deep reserves of resilience, courage and determination, all of which will be called on as the nation digs out of the devastation wrought by the worst earthquake and tsunami in its recorded history. Even the $300 billion price tag is manageable: Japan has trillions of dollars in foreign exchange reserves and billions of dollars of household savings, and its corporations are flush with cash.

No, the most important question is *what* Japan will emerge from the wreckage of March 11. Will it be a different Japan, one that seizes the opportunity to embrace change, significant and perhaps even wrenching, in an effort to revitalize and reanimate the nation? Or will it opt for the familiar, comfortable and safe option of rebuilding the Japan that existed on March 10, 2011?

THE OPPORTUNITY

RETHINKING THE MILITARY. The most ambitious blueprint for Japanese renewal would advance across several fronts, virtually recreating Japan as it now exists. For a start, it would seize the opportunity created by favorable images of Japanese Self-Defense Forces (SDF) leading efforts to deal with this tragedy and transform their legal status as defined by the nation's constitution. The SDF have existed in a legal never-never land, a military seemingly banned by the terms of Article 9 yet critical to the existence of a

modern nation. This confusion should be eliminated and the institution of the military given official recognition and legitimacy. That step, along with the outstanding work performed by the SDF during this tragedy, will help reshape public attitudes about the armed forces more generally.

Building on that step, defense planners and policy-makers should refocus Japanese security policy and put humanitarian assistance and disaster relief (HADR) at the center of its mission. Of course, any military's first mission is protection of the homeland, but there should be a realigning of priorities to push HADR higher on Japan's list. This will prepare the country for future disasters at home as well as position it to play a leading role in the Asia-Pacific region. Japan should be creating an infrastructure to lead HADR efforts within Asia: developing best practices for a national response (mastering the interagency process), leading multinational coordination efforts, even spearheading a regional emergency response team and fund.

A central part of this effort will include forging a new relationship — a more durable and creative partnership — between Japan's government and its civil society. Historically, relations between the two have been tense, some would say dominated by suspicion. That is changing, but civil society remains an underdeveloped asset in Japan (and in Asia more broadly). This tragedy gives Japan a chance to start over, a process that would unleash new energies within the country. Success in this effort could also boost Japan's soft power (discussed in more detail below).

The U.S. armed forces have been working side by side with the SDF throughout this tragedy. Operation Tomodachi has been an extraordinary success on every level: providing aid and relief to affected communities, giving the two militaries a chance to demonstrate their effectiveness and, by implication, the importance of joint training and operations, and proving that the U.S. is a friend in need, a dedicated ally and committed to the defense and security of Japan. The role of the U.S. armed forces should put to rest any doubts about the need for forward U.S. bases in Japan and the role they can play in situations short of war. An aggressive campaign by Japan (and it must be led by Tokyo) could transform the Japanese domestic debate about its alliance with the U.S. and the presence of U.S. forces in Japan.

A NUCLEAR LEADER. On another front, Japan should use the review of its national energy policy to transform its thinking. That process offers

a host of opportunities to position Japan as a regional and global leader in both nuclear energy policy and energy policy more generally. This effort will proceed on several levels.

As Asia contemplates (and appears set to lead "the nuclear renaissance"), Japan should be at the forefront of efforts to develop and inculcate new cultures of safety and security. The aftermath of the quake and the continuing problems at the Fukushima Daiichi nuclear power facilities have uncovered dangerous shortcomings in Japan's nuclear regulatory structure. Fixing these will ensure that the future use of nuclear energy is safe for Japan and could provide a regulatory model for the rest of the region. Efforts begin at home, of course, but again, the articulation and implementation of a new mindset should also have an international component. Japan should be establishing processes for the review and development of standards that reflect best practices and can be exported to other nations debating the nuclear energy option. In short, Japan should be developing and promoting regional discussions on these topics.

One especially critical — and contentious — issue is regional nuclear reprocessing capacity. Nuclear energy will require those facilities to both deal with waste and ensure fuel supplies. But the spread of reprocessing capabilities is worrisome because it is the vital prerequisite if a country wants to develop a nuclear weapon. Japan has an enrichment and reprocessing facility in Rokkasho. As part of the program to position itself at the heart of regional energy efforts, Japan could propose the internationalization of Rokkasho, offering it to other regional energy consumers. This would reduce proliferation risks and again put Japan at the heart of discussions of a critical regional concern.

As Japan rethinks energy policy, there are other ways to establish itself at the center of regional and global discussions. Other energy sources, especially renewables, should be looked at anew. (This offers a chance to build a new relationship with Russia, one source of natural gas.) At the same time, overall energy consumption can be reduced. Japan is known as one of the most efficient energy-consuming economies, but the prospect of rolling blackouts throughout the summer — by one estimate energy supply will not return to prequake levels for as many as three years — has forced the country to re-examine energy consumption. There is room for substantial

reductions in energy use. Reducing energy consumption at a time of rising energy costs again consolidates the image of Japan as leader in the field. Perhaps even more valuable is Japan's capacity to develop technologies that enable that transition and then market them to the world.

The flipside of energy policy is environmental policy. The Japanese take pride in having a special relationship with nature; many believe this is a defining characteristic of Japanese society. Rebuilding the devastated Tohoku region gives Japan a chance to confirm that ecological/environmental identity and show some real creativity. A truly ambitious plan would set aside destroyed areas as "a green zone" that establishes new standards for mixing development and protected lands. Virtually all of Asia is dealing with the effect of breakneck modernization, the spread of cities, and their encroachment on the environment; a truly groundbreaking (and land protecting) reconstruction blueprint would cast Japan as an environmental leader. The experience of the tsunami should have seared itself into Japanese consciousness as well, hopefully ensuring that any reconstruction becomes a model for other nations looking to protect their coastlines.

Rebuilding offers Japan opportunity on another front: It could use the immense project as an excuse to change visa procedures, opening the doors to an influx of regional workers. Allowing foreigners to work on construction will reduce Japanese labor costs (many of these jobs won't demand an expensive skill set) as well as help spread Japanese building practices, technologies and know-how. It could also change the image of Japan as a host to foreigners and foreign workers.

Shifting economic infrastructure. The destruction of Tohoku is exacting a toll on Japanese businesses. While it isn't an industrial center like Kobe, its businesses will need to be rebuilt, and companies throughout Japan face uncertainties about their own resilience in the event of another catastrophe as well as the more prosaic problems caused by energy shortages. As Funabashi Yoichi has argued, Japan should be more aggressive in the pursuit of strategic economic ties with its neighbors.[1] Companies should be diversifying production facilities so that they are better prepared for future disasters. China is the most obvious partner in such a strategy, but Japanese companies should look more broadly, embracing South Korea in particular. This approach would strengthen and rejuvenate Japanese busi-

ness relations and would spill over into perceptions of Japan more generally, more firmly embedding it in the critical processes and transactions that are defining and shaping Asia's future.

An integral part of economic diversification is a new approach to trade and investment policy. Japan should seize this moment to make an aggressive shift in its international economic diplomacy. As Japan spreads its corporate wings, it should do more to reduce barriers to trade and investment. A first step is signing on to the Trans Pacific Partnership (TPP). While that is being negotiated (and it will take time), Tokyo should be pushing bilateral, regional and global trade deals. This will be difficult. Not only does it go against every Japanese instinct, but it runs full speed into the powerful agricultural lobby that will push with renewed vigor against any reduction in trade protection that is the starting point for serious trade negotiations. A future-oriented policy would steamroll that opposition in the name of economic efficiency and the country's standing in the region and on behalf of Japan's international economic credibility.

This strategy would transform Japan's image. Drawing on the outpouring of support that has occurred in the aftermath of the triple catastrophe of March 11, it would reinvigorate relations with its neighbors, deeply integrating them into Japan's economic future and make them real partners. Ties to South Korea would be especially strengthened: The push for a new nuclear mindset should find a ready partner in Seoul. It shares many of the same energy constraints as Japan, is one of the most aggressive exporters of nuclear technology and will be hosting the 2012 Nuclear Security Summit, which could showcase a new nuclear framework that the two countries develop together.

All these efforts — in the fields of energy, environmental protection, economic diversification, HADR, trade policy — could transform Japan's image and place in Asia and the world. They would put it at the heart of the discussions of problems that governments throughout the region will be facing; successful solutions will contribute to the idea that Japan has broken out of its paralysis and is prepared to lead the region and address and solve pressing problems. In short, it will provide an immeasurable boost to Japan's soft power. In U.S. eyes, it would make Japan a more effective partner and ally.

This historic transformation would pay more immediate dividends. A vision of this nature would renew Japan, uniting the nation around a sense of shared purpose. It would demonstrate leadership not only to the rest of the world but to the Japanese people as well. It would engage all citizens of the country, hopefully shattering the apathy and cynicism that have been ascendant in recent years. It would give them a sense of purpose and restore faith in themselves and their national leadership. It would remind them of the need to engage with the world beyond their shores and of all that Japan can contribute.

Critics will claim that these recommendations constitute a virtual recreation of Japan. They are right. But Japan has experienced two such transformations in its modern history: the Meiji Restoration and the rebuilding of the country after World War II. Japan can do it again.

THE REALITY ...

This ambitious program is a long shot. It depends on three factors: vision, political leaders willing to invest the considerable resources needed to realize that vision and the ambition to remake Japan. I fear Japan lacks all three.

While the cleanup and recovery for a disaster of this magnitude demands a wide-ranging construction plan, that does not mean that such a plan will be visionary. The "blank slate" that Prime Minister Naoto Kan has demanded as Japan reviews its energy policy is a start, but that is one piece in a much larger policy mosaic. More significantly, any plan that relies on the usual policy-making processes and the same institutional participants is almost certain to re-create the existing agenda.

If a creative proposal emerges, political leaders have to be prepared to expend capital to push such a plan. To be blunt, the current crop of Japanese leaders has demonstrated no willingness to take risks and push a creative (and by necessity controversial) program to remake the nation. Moreover, it would be difficult for any individual politician to bring about such a change. The many interests that an ambitious program would take on demand a wide-ranging coalition of forces. Yet even a tragedy of this magnitude could not bury the instinct of politicians to play for advantage: It took just weeks for national unity to fracture under the weight of politics as usual.

Finally, realization of significant change demands opportunism. Pick your aphorism: "Crisis means both danger and opportunity" or "let no crisis go to waste." Both mean the same thing. A politician must be prepared to exploit a political opportunity. Japanese political instincts shy away from such a strategy. At a meeting of experts and officials from the U.S. and Japan a few weeks after the tragedy, Japanese participants uniformly opposed any attempt to use the images or lessons from the incident to push any policy agenda. It may be timidity or it may be common sense (in Japan), but it bodes ill for change.

Other factors contribute to the tendency to stick with the status quo. It is natural to seek to restore lives uprooted by a natural catastrophe of this magnitude to the condition they were on March 10, 2011. That inclination is compounded in Japan by an innate conservatism that favors the familiar.

Equally important is the Japanese tendency to find a target and relentlessly pursue that goal. Unfortunately, in this case the target is in the rearview mirror: recreating Japan as it existed on March 10, 2011. That objective will be realized, but it will take years, perhaps decades, to rebuild Tohoku as it was, and the rest of the world will have moved on. Worse, all the problems that plagued the country when the earthquake hit will still be there — and will have been compounded by another massive layer of debt.

The most compelling reason for sticking with the status quo is pragmatic and humanitarian: The catastrophe created tremendous human suffering, and there is a demand for quick action to ease it. The least contentious road map for the future retraces old steps. The temptation will be to rebuild the devastated areas as they were, only newer and better. That is the easy and perhaps most humane response to a tragedy that claimed 27,000 lives, uprooted 160,000 people and damaged or destroyed 125,000 homes.

THE DANGER OF DISTRACTION

While it may be asking too much of politicians and policy-makers to demand that they consider the opportunity costs of "rebuilding," there is a more immediate concern — distraction. The real danger for Japan regionally is the risk of disengagement as it focuses its energies on rebuilding, no matter what that vision might be. For many Asians, Japan has been flirting

with irrelevance for nearly two decades. While it is hard to imagine that the world's second largest economy could be in any way irrelevant, there is nevertheless a widespread perception in Asia (and elsewhere) that Japan has marginalized itself in recent years as it battled economic stagnation, political confusion and eclipse by China.[2] Japan is seen as unable to influence its environment or shape its future. The last things Japan needs in this environment are additional distractions that oblige it to turn further inward.

Rebuilding will cost hundreds of billions of dollars. Early estimates of the amount of destroyed capital stock range from $196 billion to $306 billion. [3] While Japan can afford this, it is nevertheless a burden for the government, especially one that is already among the most indebted of all developed countries.[4] The initial plans to finance reconstruction avoid some of the more obvious pitfalls. The government has acknowledged the importance of its Overseas Development Assistance (ODA). In April, the Cabinet cut fiscal year (FY) 2011 foreign aid outlays by Y50.1 billion, less than 10 percent of the original Y572.7 billion budget and about half as much as was originally to have been cut. During his April visit to Washington, Foreign Minister Matsumoto Takeaki promised to continue to support reconstruction in Afghanistan at its prequake level. On the African leg of that trip, Matsumoto said that Japan would honor its pledge to double its aid to Africa to $1.8 billion a year by 2012 and provide up to $4 billion in low-interest yen loans over five years. [5] Hopefully the government can hold the line against future cuts as well.

Diplomatic initiatives for Northeast Asia appear to be proceeding. Trade and commerce ministers from Japan, China and South Korea met in Tokyo in late April to push for a trilateral investment agreement, and finance ministers met in early May to discuss cooperation. The readiness to keep pushing cooperation among the three across a range of fields is a promising sign.

Hopes for a more substantive breakthrough among them have been dashed. For one bright shining moment, there were hopes that this disaster would finally provide a way to surmount the tensions that dominate relations in Northeast Asia. China and South Korea were quick to provide aid and comfort to Japan, and newspapers in both countries highlighted the Japanese response and its citizens' stoicism and courage. For a moment, it looked as if its neighbors were humanizing Japan, the inevitable first

step toward a broader reassessment of relations. But that moment quickly passed. Japan's Ministry of Education approved new high school textbooks that made the usual claims on Tokdo/Takeshima, and much of the Korean good will evaporated. Chinese helicopters buzzed Maritime Self-Defense Force ships near disputed waters, and China was again a threat. Both Seoul and Beijing complained about the dumping of irradiated water in the ocean without a warning and began restricting the import from Japan of foodstuffs that might be contaminated. It was back to business as usual.

That is the danger in the aftermath of a tragedy like this. As countries reel from the impact of disasters of this scale, their instincts are toward the familiar, to re-create and restore what was taken from them. Flaws are forgotten in the rush to make whole those punished by forces beyond their control. The tendency should be resisted as Japan contemplates a future after March 11.

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Endnotes

[1] Yoichi Funabashj, "Tokyo has no option but to cleave to China," *The Financial Times*, May 17, 2011.

[2] Any quick examination of its many assets — human, financial, technological — makes plain the absurdity of this proposition. Still, I have been on panels on international conferences that bluntly asked "Is Japan becoming irrelevant?"

[3] Mure Dickie, "Japan falls back into recession," by Mure Dickie, Financial Times, May 19, 2011.

[4] Yes, this money is owed to Japan, but sometime in the near future the savings that financed that spending will be withdrawn as more Japanese retire; when that happens, the economic impact will be wrenching.

[5] "Vow to double Africa's ODA stands: Matsumoto," *The Japan Times*, May 3, 2011.

CHAPTER 5
The Political Future: Who Will Benefit From Disaster?



JAPANESE PRIME MINISTER NAOTO KAN, IN BLUE (PHOTO BY STR/AFP /GETTY IMAGES)

"Kan has been no Churchill
at this time of his nation's trial."

— Rod Armstrong

Everyone but Naoto Kan
by Rod Armstrong

Rebuilding: Lessons From Aceh
by Jun Honna

EVERYONE BUT NAOTO KAN

BY ROD ARMSTRONG

The ruling Democratic Party (DPJ) is saddled with what the Japanese call a "twisted Diet" (*nejiri kokkai*). In 2010, it lost the Upper House majority it had had for three years. The DPJ had used its 2007 Upper House majority to harass the last three Liberal-Democratic (LDP) prime ministers. Now it is payback time for the LDP and its allies. It has become apparent in recent years that the Americans who wrote the Japanese constitution, unfamiliar with parliamentary systems, did not give enough power to the Lower House of the Japanese Diet. The LDP held the system together by disciplined factions united around a proven fund-raiser and by a reasonably firm party policy-making structure. Now Upper House elections often reflect an unfocused lack of voter confidence in the executive power, which in a parliamentary system is the ruling party in the Lower House.[1]

Golden Week is a series of national holidays during the first week of May. In Golden Week 2011, Prime Minister Kan made a dramatic bid to rise above the dysfunctional Japanese political system and establish his leadership of recovery from the March 11 disasters. He held the Diet in session, and public opinion forced the opposition to give Kan his supplementary budget and its implementing laws that deal with such matters as tax exemptions for refugee incomes and purchases of land or houses for reconstruction. Wickedly, the opposition held back on its funding, reserving that tool of harassment for another day.

Until Golden Week, Kan was also beset by the destructive energies of Ozawa Ichiro. A politician since 1969, he has been secretary-general of the LDP and the founder of several parties opposing the LDP. He is one of the

founders of the DPJ and leader of its principal faction, and he was the architect of its victorious 2009 Lower House campaign. He was indicted for campaign finance violations on January 31, 2011. The reverberations of this political earthquake were still rocking the DPJ on March 11. On February 28, the DPJ lost 16 of its Diet members who were unhappy with Ozawa's ejection from the party councils, and they abstained in votes on the fiscal year (FY) 2012 budget.

Ozawa declined to resign even after he came under indictment. He reportedly planned a coup during Golden Week in which he would leave the DPJ and join some combination of his DPJ faction and elements of the opposition to take over the government. The Golden Week coup did not come off, but Ozawa's cat's paw, Lower House member Tarutoko Shinji, was successful in assembling an impressive number of "younger" — less than five-term — Diet members for a study group session on May 17 (87 DPJ and 22 LDP). If the LDP and the New Komeito joined more than 80 of the disaffected "Ozawa children," it would be sufficient to bring down the government. The public is very critical of Ozawa's moves, and the LDP — and even more so their partners in the New Komeito — are cautious about getting involved in his machinations. It is a great pity that Ozawa is ending his long political career with this spasm of doomed and nihilistic ambition.

On the last day of the Golden Week holidays, May 6, Kan threw a grenade into the opposition camp. He made a formal request to the Chubu Electric Power Co. to shut down the Hamaoka nuclear power plant on the Pacific in central Honshu to make a thorough examination — by implication one that would take years — of its safety and readiness for the massive category-eight earthquake and possible tsunami that scientists predict with 87 percent confidence will occur within the next 30 years in a nearby fault.

Kan knows that his action will draw its political power from the fact that all Japanese who pay any attention to these matters understand that Hamaoka is the most dangerously sited nuclear power plant in Japan. Southern Californians might think of Hamaoka as Diablo Canyon plus tsunami risk. Hamaoka provides 10 percent of the power capacity of Chubu Electric and thus has been claimed by Chubu Electric to be vital to the manufacturing heart of Japan in neighboring Aichi prefecture, including Toyota, the nation's largest company.

The Chubu Electric board resisted the Kan decision for three days, saying the company would be able to meet its service area's power needs unless a very hot summer raised demand to a peak experienced several years ago. The Kan directive drew scathing opposition from the chairman of the premier Japanese business group, the Keidanren; probably it represents a major shift in the role of government toward priority for the needs of the public and consumers rather than those of the producers. As nearly as an outsider can tell, this shift was what the Japanese voters were asking for when they brought down the LDP structure in the 2009 election.

The Fukushima Daiichi disaster has some of the characteristics of the tainted-blood scandal of 1996 in which Kan won his political spurs by fighting and winning against an iron triangle of corporate, bureaucratic and political establishments.[2] The Japanese public knows that the reactor units were relicensed for an additional 10 years by the Nuclear and Industry Safety Agency (NISA), which is answerable to the Ministry of Economics, Trade and Industry. The 10-year extensions came despite the fact that after 40 years of service they were past their design life, a substantial number of the proper inspections had not been made and a number of crucial upgrades to the oldest reactors had not been carried out.

Kan's decreed investigation will likely show that TEPCO and NISA were in an incestuous relationship maintained over the years by *amakudari* ("descent from heaven") postretirement sinecures at one or another of TEPCO's 258 subsidiaries, procurement strategies that favored conservative-linked providers, and political activities that gave them one tame member of the Upper House for many years. Kan has promised a complete and independent investigation of TEPCO decision-making after the crisis has wound down. It will doubtless confirm the public contempt for the management of the politics of nuclear power over the 50 years of LDP leadership.[3]

Admittedly, Kan has been no Churchill at this time of his nation's trial. His awkward public appearances at the refugee shelters have been painful to watch. He seems to have no sense of public relations strategy. For example, his announcement of his "administrative guidance" on Hamaoka was so terse it left an opening for the viciously negative Japanese media to criticize him for putting in doubt the future of the entire Japanese nuclear power industry, on which the nation's economy has depended for some 30 percent

of its electric power. He had to explain carefully the following day that his closure guidance had been for Hamaoka only.

Indeed, Kan's overall position since the Fukushima Daiichi disaster has been that Japan should continue its development of nuclear power but put new emphasis on such renewable power resources as solar and wind and do a ground-up review of the safety of Japan's existing nuclear plants. In any case, some 40 percent of Japan's nuclear power plants are offline at the moment for various reasons, including the need for upgrading necessitated by past earthquakes. When the Fukushima Daiichi crisis comes under control and the safety of the other plants is assured, the Japanese nuclear power plant industry will revive. Toshiba has bought Westinghouse and will have to recover its investment. The Japanese still have advanced discussions concerning nuclear power plants in Vietnam and Turkey. The Mongolians are talking with Japanese interests about establishing a nuclear waste facility in their country. Any Japanese government of whatever political stripe will have to support the industry when it restructures for renewed exports.

Kan is receiving indirect public relations assistance from an unexpected source. The emperor went on television to call for national unity — an action for which the only imperial precedent was his father's radio address to the nation announcing Japan's surrender 65 years ago. He and the empress then began to visit gymnasiums and other locations in the Tokyo and Chiba areas, greeting refugees who remained seated on their bedding by kneeling and discussing their situations quietly. Occasionally, the emperor asks questions that have policy implications: "Are you concerned about asbestos in the debris?" Instead of the strange outfits affected by Kan and the bureaucrats, work uniform jackets juxtaposed with white shirts and knotted ties, the emperor wears spiffy turtlenecks against the cold and a golf jacket — with no apparent loss of imperial dignity. In late April, the imperial couple, despite their fragile health, began to make Self-Defense Force helicopter visits to the disaster areas. The televised reactions from the refugees have been of gratitude and respect.

Performance in the aftermath of a disaster sometimes brings a hitherto obscure politician into the spotlight of history. After March 11, the spotlight fell on Edano Yukio, the relatively young (46) chief Cabinet secretary. As such, Edano is the spokesperson for the government, and Kan seemed

to be quite willing to hand over the attention to him. Edano's district is in one of the affected prefectures (Tochigi), and he is a graduate of Tohoku University, the prestigious university that is the soul of the badly damaged city of Sendai. Edano spent hours on television responding to the searching questions of the press in a deliberate and calm manner. His briefings were obviously based on a great deal of staff work that added to their clarity — quite in contrast to the confused and sometimes tearful briefings of the TEPCO executives. They were also models of simple and nonbureaucratic Japanese, bereft of humor but full of obvious sincerity and concern. Edano's performance gave rise to the most popular Twitter hashtag of the day, an affectionate "Edano_Get some sleep!"

As the crisis continued, however, there were complaints that the government was holding back information about the potential health risks of the radiation released by the crippled plant, and Edano admitted that the government had avoided the release of data that might have caused panic. Enter Hosono Goshi, an articulate DPJ Lower House member from Shizuoka. Even younger than Edano, he was elected in 2006 at age 30 and after 10 years is a fairly seasoned politician. Despite the fact that Hosono was originally an Ozawa man, Prime Minister Kan made him a special assistant in charge of coordinating the release of information on the Fukushima Daiichi disaster. His solution is to drown the media and public in data. He has integrated the daily press conferences by TEPCO and NISA, resulting in numbingly lengthy and detailed sessions from which it is difficult for the reporters to extract summary stories.

During Golden Week, Hosono released all the System for Prediction of Environment Emergency Dose Information hour-by-hour data that integrate weather and radiation counter information to show the likely direction and coverage of radiation plumes from the Daiichi explosions and releases. While there have been and probably will continue to be extended controversy about the setting of radiation limits for individual areas, Hosono's actions mean the government cannot be accused of hiding data. By mid-May, the radiation readings meant that additional areas northeast of the original 30-kilometer circle had to be evacuated.

Kan's Golden Week initiatives gave new force and direction to a crisis management program that had already seemed to be coming together — at

least on paper. TEPCO has published a reasoned plan for getting the Fukushima Daiichi plant back under control in six to nine months. There has been an announcement of a plan to set up an independent commission on nuclear plant safety. There have been some preliminary but interesting ideas revealed by the new Reconstruction Design Council chaired by the distinguished political scientist Iokibe Makoto, who is not only very intelligent and personable but has unimpeachable credentials as a victim of the Kobe earthquake.

The debates on the taxes and higher electric rates that will be necessary to pay for the cleanup of the disasters will be bitterly fractious. No group within Japan's voting public will be happy with the final distribution of responsibility. Accordingly, most experienced political observers think that given Kan's improved but still low poll numbers, he will be pushed out in June or July. As long as Ozawa sulks in his tent, putting together a DPJ Cabinet would be very difficult (although some dream of a "next generation" Cabinet that might include such youngsters as Edano and Hosono). Considering that power is returning to the bureaucracy in the current crisis, there will be heavy pressures to move to the right and to revive, perhaps in new forms, at least some of the old producer-first policies. Many are betting on a coalition with the LDP and the New Komeito.

There seems little chance that Kan or his party can gain the political support needed to provide Japanese leadership on any pressing international issue. The Kan government has already indicated that Japan will have to extend the deadlines for its actions to combat global warming. Although Kan has set up a promising advisory structure with the goal of reforming Japanese agricultural policy to prepare the way for participation, he has said that work toward Japan's entry into the Trans-Pacific Partnership negotiations will have to be delayed. This is not the time to battle the farm lobby, a substantial number of whose representatives come from the Tohoku region and form Mr. Ozawa's political base.

East Asia politics

The Ministry of Foreign Affairs has assembled the facts about national and organizational contributions toward relief of the March 11 disasters on

its website. Understandably, the MOFA site makes no attempt to list the multitude of contributions from private organizations and individuals. It makes some attempt to follow the contributions in kind made to resolution of the Fukushima Daiichi catastrophe, but the coverage is incomplete. The discussion below focuses on the political considerations connected with the March 11 disasters affecting Japan's relations with its neighbors.

China. China's response to the Japanese disasters has been correct but somewhat distant and reserved. The Great Sichuan Earthquake of May 2008 resulted in a death toll a little over three times the projected 30,000 of the Tohoku disaster. This in an area where the bulk of the country's supersecret nuclear deterrent force is located. The Japanese, after some delay with the necessary landing permissions, sent a Self-Defense Force aircraft with a search-and-rescue team of some 50 members that stayed for about a month. A picture of team members pausing for a moment of respect upon discovery of a buried body was widely published in China. The team must have done excellent service, for President Hu Jintao himself praised the team's "professionalism."

In September 2010, however, the Japanese arrested a Chinese fishing boat captain after he rammed a Japan Coast Guard vessel in the disputed waters of the Senkaku Islands. The resultant Chinese overreaction took Japanese-Chinese relations to their lowest ebb since the Koizumi visits to the Yasukuni Shrine. The Chinese began to back away from their extreme retaliatory measures in the winter of 2010, and the Japanese put a great deal of effort into smoothing things over.

In response to the Tohoku disaster, a Chinese search-and-rescue mission of 15 members was sent for a week's service on March 13, traveling to Tokyo on a chartered commercial flight. A diverse range of relief goods was sent, the most important contributions being 10,000 tons each of gasoline and diesel fuel. There was an immediate contribution of Y4,500,000 (approximately $55,000) from the Chinese community in Japan. The Chinese Embassy in Tokyo website puts a value of RMB105 million on its contributions (Y1.3 billion or just over $16 million).

The Japanese Ministry of Foreign Affairs released a summary of an April 12 telephone conversation between Prime Minister Kan and Premier Wen

Jiabao. Premier Wen was warm and courteous in response to Kan's expression of gratitude for Chinese assistance: "[A]s a neighbor, China felt as if the earthquake had occurred in China, and [he was] confident that the government and the people of Japan would surely overcome this difficult situation and succeed in [Japan's] reconstruction." The problem is that Wen visited Japan in May 2010 after the North Korea sinking of the Republic of Korea's *Cheonan*, made an apparently heartfelt statement of regret about the South Korean loss of life — fully up to the President Clinton standard — and then was unable to do anything about controlling his North Korean clients. And then there was the disgraceful behavior of his government at the time of the Senkaku ramming.

The Chinese government has a great deal to answer for in terms of its hyping of anti-Japanese sentiment in China. Even at this time of tragedy in Japan, three generations after Japanese aggression in China, the chatter on Chinese websites was distressingly cruel. There were some widely publicized and positive stories that demonstrate the ties of human respect among Chinese and Japanese as the two nations' economic ties continue to multiply geometrically. These instances of good will at the private level cannot, however, assure the Japanese of stability in the relationship.

Republic of Korea. Although the U.S. was the major contributor to the post-March 11 relief, search and rescue operation by a wide margin, the Republic of Korea was almost certainly the next largest. In addition to a large search-and-rescue mission sent promptly after March 11, the Koreans have responded on an ad hoc basis to the needs of the Americans in carrying out Operation Tomodatchi and to TEPCO as it fights the meltdown at Fukushima Daiichi, supplying at least one water pump vehicle and probably a great deal more.

At the private level, Koreans have been astonishingly generous. The early days of the Korean fund-raising, led by the substantial Korean Christian community, are believed to have set new records for the most money raised in the shortest amount of time. There was a glitch in the Korean fund-raising when it became known that the Japanese educational authorities had once again included a reference to Japanese sovereignty over the rocks (and their fisheries zones) known as Dokdo in Korean and Takeshima in Japa-

nese. The Japanese Ministry of Foreign Affairs released a diplomatic white paper that made the same claim. Despite this stumble, the total of Korean private donations is reported to stand at some KRW56 billion ($51 million). The contribution of the American Red Cross, by comparison, was $20 million (contrasted to the Japanese contribution of $30 million at the time of the Katrina disaster).

Conservative South Korean President Lee Myung-bak has been determined to improve South Korean-Japan ties in the face of North Korean provocations. The Japanese welcomed his restraint during last year's ceremonies marking the centennial of Japan's annexation of Korea, and Kan responded with a new statement of regret for Japan's past actions there. Japan promised to return the records of the last Korean dynasty, currently in the possession of the Imperial Household Agency, but LDP right-wingers killed the necessary legislation at the end of the last 2010 Diet session. It seems unlikely, however, that this action or the Dokdo/Takeshima flare-up will disturb the progress toward greater Japan-Republic of Korea cooperation in the face of North Korean threats. Cooperation has now extended as far as the presence of Self-Defense Force observers at U.S.-Republic of Korea naval exercises.

Trilateral China-Japan-Republic of Korea cooperation. The major diplomatic question in Northeast Asia remains the restraint of North Korean development of weapons of mass destruction. The diplomatic instrument for attempts to accomplish this goal has for several years been the Six-Party Talks among the two Koreas, Japan, China and Russia. The talks have been suspended since North Korea's second nuclear test in 2009. American, Japanese and Republic of Korea policy in recent years has been to pressure the Chinese to control their North Korean clients, and the pressures on China increased with last year's sinking of the Republic of Korea Navy corvette *Cheonan* and the shelling of Yeonpyeong island. The Chinese have been attempting to split off the Japanese from their American and Korean (tacit) allies, but the Japanese have held firm.

It had been agreed prior to March 11 that the tripartite Japan-Korea-China summits, discontinued last year because of the Chinese snit over the Senkaku islands, were to be resumed this year for a two-day meeting in

Tokyo starting May 21. Two sets of preparatory talks have been held at the trade and finance minister levels, and everything appears to be on track for a constructive summit. The Japanese were not, however, able to get the issue of radiation checks of their exports onto the agenda, which is now confined to disaster preparedness, nuclear power plant safety and "other matters." It is doubtful whether this meeting will be as exciting as the 2009 summit in the ancient Korean city of Gyeongju, when Chinese Foreign Minister Yang Jiechi walked out of one session when then-Foreign Minister Okada asked him why China was the only country in East Asia adding to its military weaponry.

Russian assistance. Japan's relations with Russia were at a very low point on March 11. The decision of President Medvedev to visit the disputed Kuril Islands in early February of 2010 and later to direct a strengthening of the islands' defenses set off a bitter war of words. Kan raised the dispute to a new level in February 2011 at a rally where the Russian flag was burned when he called the Russian actions an "unforgivable outrage." The Russians responded to March 11, however, with expressions of sympathy, a two-week dispatch of a large search-and-rescue team and a moderate number of relief goods. They also provided some assistance to TEPCO that appears to be unrecorded either by the MOFA or on the Tokyo Embassy Web page.

Nuclear power plants are, along with arms, one of Russia's few manufactured goods for export. One of the country's major sales points is that it will store the nuclear waste from the plants it sells. Very rightly, it fears the competitive power of the Japanese industry once it recovers from the Fukushima Daiichi disaster. This presumably is the reason for the dog-in-the-manger nature of Russian public commentary on the disaster. Generally speaking, Russian commentators criticize the Japanese for what they call their exaggerations of the gravity of the Japanese disaster in comparison with Chernobyl. Apparently they believe that the commercial worth of their own safety claims depends on the gravity of the lessons they have learned from Chernobyl. Reportedly, they attempted to turn one International Atomic Energy Agency meeting into a forum for advancing this line of sales effort.

The Russians have announced that they will double the availability of crude oil exports to Japan this year and will improve availabilities of liq-

uefied natural gas (LNG) and coal as well in an action meant to augment Japan's energy supplies during its problems with its nuclear power plants. There was considerable fanfare when a large Russian LNG tanker arrived in Chiba in April. Industry analysts said they doubted that energy brokers would receive the Russian proposals enthusiastically.

North Korea, itself a desperate candidate for famine relief, told the press March 24 that Kim Jong-il was sending $500,000 to relieve the sufferings of Korean expatriate victims of the disasters. The North Korean Red Cross was to forward another $100,000. The donation is not listed on the MOFA Web page, and in view of the financial sanctions being enforced against the rogue North Korean regime, it is not clear how Kim's donation could be transferred.

Alliance Politics

At an appropriate time, there will probably be a formal and complete report of the enormous American rescue-and-relief mission known as Operation Tomodachi (Japanese for "friend"). Its general outline is known, but we have only an $80 million Bloomberg News estimate of its cost. The American military mobilized 20 ships, including the enormous carrier *Ronald Reagan*, 160 aircraft, and some 20,000 personnel. The peak number of 20,000 for personnel includes the crews of the Tomodachi naval fleet. From press reports, it would appear that about 8,000 troops were involved in ground operations. The operations of the Australian military were tightly integrated with those of their American allies, and the Americans provided a great deal of transportation and liaison services for the rescue-and-relief missions of other countries. The MOFA Web page gives all the statistics of supplies and services provided together with brief reports of some of the major projects accomplished by the Americans, perhaps most notably the impressively rapid restoration of partial services at the drowned Sendai airport.

The MOFA site also details American military support of the TEPCO efforts at the Fukushima Daiichi site. The American Nuclear Regulatory Commission has played a vital role in advising Japanese authorities on response to the Daiichi emergency, but it has not published any summary

of its actions. According to a *Japan Times* report, an unnamed American senior technical adviser arrived very soon after March 11, was initially rebuffed, but as the situation worsened was invited to live for 10 days at the Japanese White House, the Prime Minister's official residence. NRC Chair Gregory Jaczko told the Senate Environment and Public Works Committee on April 12 that the NRC has a team of 250 specialists working on the Daiichi response and that by rotation the team keeps 11 or so in Japan. The latest NRC Commission meeting was closed. Obviously there is a story yet to be told about Japanese-American cooperation in response to the Daiichi emergency.

What one might call the diplomacy of Operation Tomodatchi was handled very well. The American effort, while large and involving a great deal of highly specialized equipment and skill sets that made key contributions,[4] was rightly positioned by the U.S. spokespeople as supplementary to the operations of the Japan Self-Defense Forces, which had 100,000 members in the field. The Self-Defense Forces have perhaps the most extensive experience in disaster relief of any military in the world; they still have a unit operating in Haiti. There seems to have been quick mutual agreement on directing American efforts to projects such as the restoration of Sendai Airport where the American equipment and skills could do the most good. The American military were modest in their relations with the Japanese media, and they were rewarded with coverage that, in the end, left the impression that the American military was sincere, modest, efficient and extremely well equipped.

It was ironic that the first American military aircraft to arrive over Tohoku after March 11 were flying reconnaissance from the Futenma Marine Air Facility on Okinawa. Futenma, a minor base in the structure of American military power in East Asia, has been for some years the principal issue of alliance politics. The Futenma facility is a noisy and dangerous air base sited in the hole of a doughnut formed by Ginowan City (population 85,000), a city that merges into a surrounding conurbation of a quarter of a million souls. After a horrific gang rape of an Okinawan schoolgirl by three American military personnel in 1995, Secretary of Defense William Perry decided that the base should be closed. The question then arose as to where to put the Marine Air. Most assumed that a new facility could be carved

out of the vast stretches of unused land at the huge Kadena Air Force Base reserved for "aircraft parking in emergencies" (i.e., another Vietnam War).

The Marines, however, had dreams of having their own, new-built base. Part of their motive for demanding their own base was to have a place to tuck away their Osprey aircraft. These "vertical takeoff," hermaphrodite crosses of a helicopter and an airplane cost $80 million each to transport 24 Marines into combat. Okinawa is an island crowded with American bases and about one-third the size of Long Island. About the only spot available — and then only after extensive land fill — was Oura Bay on the relatively underpopulated northern tip of Okinawa, adjacent to the Marines' Camp Schwab. It is a lovely and fragile environment, home to dugongs, the Asian manatee, several species of turtles and other endangered species of plant and animal life.

More than 10 years of negotiations ensued. Many different concepts were proposed and then abandoned. The LDP instituted a program of enormous subsidies to the northern area of Okinawa, running at the yen equivalent of $100 million a year. However, opposition by the Okinawans continued to build, particularly after a helicopter crashed into a building of Okinawa International University at Futenma in 2005 and burst into flames.

In 2006, the failing Rumsfeld Pentagon and the failing LDP agreed on a complex arrangement that bribed the Marines with more than $6 billion of Japanese money to send half the Okinawa Marines to a new base on Guam and build a new air facility at Henoko Village on Oura Bay. Very large anti-base demonstrations began and grew in size and intensity. The Pentagon held firm, however, insisting that the Marines were vital to protecting Japan from North Korean aggression.

The DPJ came into power in 2009 thinking naively that the new Obama administration would quickly agree to back off from such a clearly unworkable arrangement. It was surprised when Obama appointed a retired Marine four-star general who had served on Okinawa as his national security adviser and that the State Department assistant secretary for East Asia, Kurt Campbell, was a former Pentagon official in the Clinton administration.

Moreover, the DPJ discovered that as a result of the North Korean missile and nuclear weapon tests, the main island electorate in Japan had developed an intense sense of reliance on the U.S. military for its security. No matter

that its real security from North Korean aggression was provided by the 600,000 well-trained and equipped military of the Republic of Korea. Suddenly the Marines assumed great symbolic importance, and the Okinawans would just have to make some additional sacrifices for the greater good.

The Americans treated the Hatoyama administration about as rudely as it is possible to treat an ostensible ally. The dwindling American press corps in Tokyo, unfamiliar with Okinawa and uninterested in base issues, did no investigative reporting. The American-based Japan studies community and the friendship societies either stood by idly or joined the Pentagon and its State Department agents in talking self-righteously about Japan's responsibility to provide bases under the Mutual Security Treaty and exaggerating the inexperience of the DPJ.

The onslaught of American insults played a large role in bringing down Hatoyama in June 2010. His last-minute pledge to fulfill the 2006 Rumsfeld-LDP agreement brought him no American support. The State Department and the Pentagon did, however, seem somewhat abashed. There appeared to be a tacit agreement between the two governments to shelve the agreement temporarily. And there matters rested on March 11.

Unfortunately for the ambitions of the Marine generals, the splendid performance of the American military brings no promise of any change in adamant Okinawan opposition to any new bases.[5] The Okinawans are developing a tourism connection with the Chinese on Taiwan and the mainland and are developing a high-tech sector based on their geographic location on the Internet and their geological stability that makes them a good site for backup storage. They are in no mood to remain forever an American military colony.

On May 11, three powerful senators — Democrat Carl Levin of Michigan, chairman of the Senate Armed Services Committee; Democrat James Webb of Virginia; and Republican John McCain of Arizona, ranking minority member of the Armed Services Committee — at long last intervened to end the stasis. They called the 2006 agreement "unrealistic, unworkable and unaffordable." Unbelievably — but somehow reflective of this strange chapter in American-Japanese relations — Secretary of State Hillary Rodham Clinton, a former senator, had her press spokesman reject the senators' criticisms and say that U.S. policy was still to support the 2006 agreement.

Edano, speaking for the Japanese government, must have felt that he had no choice but to go along with Clinton and pretend that the zombie agreement is still alive.

Levin said the senators' report was largely the work of Senator Webb, a former Marine and secretary of the Navy under President Reagan. While well considered, it is mostly only common sense. It deals with matters that should have been resolved by ambassadors and undersecretaries long ago.

Japan and the U.S., together with the Republic of Korea, need to think more deeply about security issues in East Asia. The U.S. is in an "assured mutual destruction" relationship with China, its principal banker and leading trade partner. With rise of Chinese missile power, last year's report to the U.S. Congress by its U.S.-China Economic and Security Commission noted the vulnerability of the runways of the American Air Force bases in Korea and Japan. The U.S., on the other hand, has brought in huge Ohio-class submarines surplus to the quotas of START II reconfigured to fire salvos of Tomahawk conventionally armed missiles. These developments are the raw material for arms limitation negotiations. Perhaps Henry Kissinger's new book on the U.S.-China relationship highlighting some of these issues will get American creative juices flowing.[6] It is a great shame that the Japanese educational and military establishment produces so few security experts and that the Japanese political system is dysfunctional to the point that it seems incapable of producing leaders with broad strategic views.

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Endnotes

[1] For a clear and more complete explanation of the political science involved, see Iinuma Yoshisuke, "Behind the gridlock: Why Japan seems ungovernable," *Oriental Economist*, March 2011, pages 5-6 (subscription only). The *Oriental Economist*, edited by the excellent political economist Richard Katz, is very good on current Japanese politics. Another good source that adds a sharp focus on Washington policy-making is the DispatchJapan blog written by the skilled journalist Peter Ennis.

[2] While Health and Welfare minister in the brief Murayama coalition government, Kan investigated and dealt forcefully with collusion among bureaucrats, ultra-rightist politicians and Green Cross, a corporation founded by three former members of the notorious Unit 731 that had used humans for biochemical warfare experiments in Manchuria during the war. For 13 years, while some 1,500 to 2,000 Japanese, mostly hemophiliacs, were dying, the ministry had been shutting out the American technology for heating blood to eliminate contamination with HIV. Some of the key ministry bureaucrats were provided well-paid executive jobs after retirement. On Unit 731, see Sheldon H. Harris, *Factories of Death* (London: Rutledge, 1994). For a skeptical analysis of the significance of Kan's actions, see Eric A. Feldman, "Deconstructing the Japanese HIV Scandal," Japan Policy Research Institute, Working Paper No. 30, February 1997, available on the JPRI website.

[3] The best English-language review of the Japanese iron triangle in the nuclear power industry has been done by Yuri Kageyama of the Associated Press in this May 1 report, "Ties that bind Japan's nuke sector, regulators." Americans, however, should look to their own lax regulation of their nuclear power industry. See the May 7, 2011, report in the *New York Times:* Tom Zeller Jr., "Nuclear agency is criticized as too close to its industry." See also the Wikipedia page on the blundering way in which Diablo Canyon has been reinforced and the courts' denial of remedies to activist groups.

[4] The most complete coverage of Operation Tomodachi now available is on the website of the National Bureau of Asian Research. The list of special equipment and skills used is very long. Examples of equipment: side scan sonar to identify underwater debris hampering the reopening of harbors, U.S. P-3 Orion and satellite capabilities for wide-area observation for locating bodies at sea and identifying debris fields hazardous to navigation, the 40,000-ton *USS Essex*, with its helicopter landing deck and the capability of mothering two landing craft and landing troops and equipment directly on beaches, U.S. Navy barges to bring vast quantities of fresh water to cool the Daiichi reactors and more. Skill sets: In addition to the special U.S. Air Force detachment

that so quickly restored Sendai Airport for use by relief flights, there were underwater construction crews and demolition experts, a substantial and highly trained radiation cleanup crew that thankfully did not have to be deployed, radiation monitoring specialists and aircraft fitted with the appropriate equipment and more.

[5] Even the U.S. military's own newspaper drew this conclusion: Travis Tritten and Chiyomi Sumida, "U.S. relief mission likely will do little to ease tensions over Futenma," *Stars and Stripes Pacific Edition*, April 10, 2011.

[6] Henry Kissinger, *On China* (New York: Penguin Press HC, 2011).

REBUILDING: LESSONS FROM ACEH

BY JUN HONNA

Soon after the March 11 disaster in Tohoku, northeastern Japan, the Indonesian media spotlighted Zahrul Fuadi, 39, and his family, who amazingly experienced and survived the two biggest tsunamis in history. Seven years ago, in December 2004, this doctoral engineering student lost his house in Banda Aceh, the capital city of Aceh province in Indonesia, when a 9.1-magnitude quake and massive tsunami entirely destroyed the city, killing some 126,660 people — with more than 90,000 people still missing — and displaced more than 500,000 people in the province. Fuadi came to Japan after obtaining a scholarship to complete his doctorate at Tohoku University in Sendai city, where he experienced another 9.0-magnitude earthquake and a tsunami that destroyed the city's coastal areas and inundated Sendai Airport on March 11, 2011.

For many ordinary Indonesians, the story of Fuadi gives a sense of togetherness with Japanese people who shared the nightmare of a disastrous tsunami. But for political elites in Jakarta, it was equally impressive that the Kan administration did not withdraw its commitment to dispatch troops of the Self-Defense Forces (SDF) to Manado, Indonesia, for co-chairing regional exercises for disaster relief with Indonesia, which started on March 14. During the five-day training for ASEAN Regional Forum's Disaster Relief Exercise, Japan and Indonesia practiced regional military cooperation for disaster relief — an event that earned sympathy in Indonesian government circles, according to a Japanese diplomat stationed in Jakarta.

Indonesia's official response to Japan's March 11 has been greatly influenced by these two stories, and it is against this backdrop that the Yudhoyono

government has clearly taken a leading role in mobilizing Southeast Asia's support for Japan's post-tsunami recovery. Apart from many private-sector initiatives, Yudhoyono — within a week after March 11 — announced his decision to provide $2 million as Indonesia's official emergency assistance to Japan, which is perhaps the largest among Southeast Asian governments. Also on Yudhoyono's initiative, a Special Association of Southeast Asian Nations (ASEAN)-Japan Ministerial Meeting was held on April 9 in Jakarta to express ASEAN's collective will to assist in the relief and recovery efforts and support medium- and long-term rehabilitation and reconstruction plans for Japan. Then in early May, Indonesia's National Agency for Disaster Management provided 1.5 tons of emergency food to Tohoku. These efforts by Indonesia have boosted bilateral relations.

Japan has long seen Yudhoyono as a future bridge between the two countries and invited him to has take part in the Japan International Cooperation Agency-sponsored regular bilateral meeting since mid-1999, when he was still an active three-star army general. In Japan's diplomatic circles, Yudhoyono's presidency since 2004 has been welcome, and it is reaping the fruit of the decade-long friendship.

Learning from Aceh

In Facebook, blogs and tweets, we see many Indonesians communicating with victims of March 11 and nongovernmental organization (NGO) workers in Tohoku, encouraging their activities for the postdisaster recovery. In particular, people in Aceh seem to have special compassion for the Tohoku victims, as they still remember Japan's post-tsunami assistance in Aceh. A slogan such as "Aceh for Japan: We are a family" can be found in many places in cyberspace. Despite the psychological proximity, however, Indonesians typically believe that conditions in the two countries are so different that it is hard to find Aceh's lessons for Japan. Many note that Tohoku is not experiencing civil war, unlike Aceh; its economy is not exploited by the central government; society is not suffering from poverty; it is not strongly influenced by religious values and so on. With these differences in mind, Indonesians are hesitant to teach Aceh's lessons to us.

Regardless of differences in sociocultural contexts, however, there is a

great similarity in the politics of post-tsunami recovery, and this is what we have to learn from the experience of Aceh. In the case of Aceh, there was an obvious lack of local governance capacity to handle the huge amount of donations for relief and recovery, including Japan's bilateral donation of $146 million. It was mainly due to the military takeover of local governmental functions in escalating martial law against the Aceh separatist movement since 2003. Thus, after the tsunami, the central government established the National Agency for Rehabilitation and Reconstruction (BRR) to channel the donations for Aceh's recovery projects, and — as easily anticipated — civil society organizations soon accused it of systemic corruption as it suffered from low transparency and accountability. In 2006, a reputable Jakarta-based NGO, Indonesian Corruption Watch, claimed that BRR officials embezzled more than 97 billion rupiah (around $9.7 million). This high figure is not unlikely given the nature of the construction sector and the opportunities for graft in building 120,000 temporary housing units for millions of displaced people. Many ordinary Acehnese knew that these local building contractors were ex-militia who had been fighting against the government. The tsunami brought the end of armed conflict in Aceh, but the subsequent "peace" was built on co-opting ex-combatants through corruption.

This is not to say that Tohoku will be similarly vulnerable to massive corruption but to underline the significance of immediately restoring and strengthening local governance capacity in response to the booming of the reconstruction business in the coming years. Projects such as the removal of rubble, rezoning of land, rebuilding of public infrastructure and reconstruction of tsunami walls, agricultural dams and fishing ports greatly empower concession hunters involving bureaucrats, Diet members, local politicians, developers and — of course — organized crime. During the last two years of the Democratic Party of Japan administration, government ministries have faced drastic cuts in their budget for construction projects, and now is a perfect chance for them to recover the lost territory in the name of post-disaster recovery. In particular, the Ministry of Land, Infrastructure, Transport and Tourism, Ministry of Agriculture, Forest and Fisheries and Ministry of Health, Labor and Welfare seem to have great ambitions to take regain budget allocations in the reconstruction projects involving highways, land

improvement and housing. The possible booming of these public works will surely invite wily concession hunters, and they may silently undermine the very aim of post-tsunami recovery if the government fails to implement strong governance. In fact, a story of a homeless man in Nishinari district, Osaka — who was recruited by a dubious construction company and ended up being deceived and forced to work at Fukushima No. 1 to remove a pile of rubbish — strongly indicates that the criminal underworld is already active in the disaster business.

Aceh's experience also reminds us about the politics of anti-reformists. In the process of rebuilding post-tsunami Aceh, the international community and local civil society organizations struggled to promote universal values such as gender equality, minority protection, children's rights and village democracy for local conflict resolution. It was an attempt to reform the society as Aceh had long been dominated by local power elites that controlled land and accumulated capital during Suharto's three decades of authoritarian rule. As the tsunami destroyed the basis of elite domination, the local civil society expected that the recovery process — which was supported and observed by the international community — would bring fundamental social transformation to eliminate the past legacy. However, five months after the tsunami, with the establishment of the BRR in April 2005, we saw the fading international interest in the Aceh issue, and the momentum was effectively recaptured by Aceh's old elites, which mobilized feudalistic patronage power to emasculate the civil society movement. Thus, in many places in Aceh, the post-tsunami recovery ended up rejuvenating and reproducing the old power structure rather than promoting social transformation.

Tohoku is not Aceh, of course, and civil society is seemingly stronger in Tohoku and Japan overall. Nevertheless, Aceh's case illustrates the talent of antireformists that — in the case of Tohoku — can be seen in an attempt to legitimize the policy of a tax increase on the pretext of promoting post-disaster recovery. It is not surprising to see the shadow of the Ministry of Finance behind the campaign that often presents a poll saying that many respondents agree to help Tohoku with the money collected by a tax increase. In tandem with this, a month after March 11, the Reconstruction Design Council was established directly under Prime Minister Kan, and its first public announcement interestingly emphasized the need for increasing tax-

es for the Tohoku recovery, without sketching the grand design for reconstruction. This invited public criticism that bureaucrats are transforming the disaster into an opportunity to implement their longstanding agenda.

Government discussion on the post-tsunami recovery tends to focus on restoration of what has been lost rather than boldly conceiving reconstruction of the region. Just restoring what has been lost will be ineffective if it is operated according to a bureaucratic mindset that easily authorizes projects to restore useless breakwaters, local railways in the red, unused recreational facilities and so on. These projects merely benefit local strongmen in the construction sector and reproduce social problems that have long contributed to the serious depopulation of communities in Tohoku. In other words, the recovery process can be hijacked by politico-business elites and may shortchange the real needs of the local people. Taro Kono, a young outspoken politician from the Liberal Democratic Party, in commenting on the crisis at the Fukushima nuclear plant, openly criticized Japan's nuclear industry as a hotbed of collusion and cozy ties with government that puts the public interest and safety at risk. It is an important warning that should be extended to the broader postdisaster recovery business.

In sum, despite the indifference of many Japanese to Aceh's post-tsunami experience, there are many important things to learn from it. As discussed, the lack of governance and weak civil society control over the recovery plan resulted in the unintended re-empowerment of local politico-business elites in Aceh. The same thing could happen in Japan where antireformists have attempted to promote their old agenda under the pretext of postdisaster recovery. It is a challenge for Japan's developing civil society to take initiatives for promoting a vision of reconstruction, demanding wider participation in policy-making, greater transparency and accountability to avoid such a bleak scenario. The beleaguered people of Tohoku deserve no less.

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CHAPTER 6
The Nuclear Future: New Questions



NAMIE, JAPAN, APRIL 14 (PHOTO BY SANKEI VIA GETTY IMAGES)

"TEPCO was a paper tiger — a highly leveraged house of cards held together by trust and respect."

— Paul Scalise

Could the Meltdown Have Been Avoided?
by Lawrence Repeta

How American Nuclear Reactors Failed Japan
by Andrew Horvat

Can TEPCO Survive?
by Paul J. Scalise

Moving Out of the "Nuclear Village"
by Andrew DeWit and Masaru Kaneko

Why a Nukes-Free Future Is a False Dream
by Robert Dujarric

Building the Next Fukushimas
by Gavan McCormack

COULD THE MELTDOWN HAVE BEEN AVOIDED?

BY LAWRENCE REPETA

Someone interviewed a nuclear plant worker who scrambled out of the path of a great wave on March 11. From his vantage point, he saw the wall of water strike the Fukushima No. 1 power plant and pour over the countryside. Then he spotted a big barrel-shaped item bobbing up and down in the surge. To his horror, he watched one of the tanks intended to supply fuel to emergency power generators floating away.

The 9.0-magnitude earthquake hit the country so hard that it moved the entire island of Honshu by more than two meters. The epicenter of the quake was about 100 kilometers offshore and about 100 kilometers north of the six nuclear reactors in the Fukushima No. 1 complex. It produced tsunami waves said to be nearly 15 meters high at the point where they came ashore and struck the nuclear power station. Despite the terrible shock of the quake, early reports suggested that the nuclear reactors themselves stood solid, all of them automatically shutting down as designed and with minimal damage.

But as the startled worker could see, the emergency cooling systems were gone. Under normal conditions, Japan's nuclear plants access electricity from the national power grid. When that connection is broken, as it was on March 11, the plan calls for emergency diesel generators to take over to provide power to run the cooling pumps that draw water from the sea to be circulated within the plant to keep the reactor cores from overheating.

Loss of the cooling systems on March 11 would lead to severe damage to the facilities; radiation leaks into the air, land and sea; the meltdown of nuclear reactor cores; and the evacuation of at least 80,000 people.

As I write this, the radiation leaks continue, the evacuees wonder if they will ever be allowed to return home and we still have no clear answer to the question: "Who is responsible for the failure to provide adequate protection against the great tsunami?"

Fukushima No. 1 and Fukushima No. 2

With annual revenues of approximately Y5,000 billion (more than $50 billion), approximately 28 million customers and 38,000 employees, the Tokyo Electric Power Co. (TEPCO) is commonly described as the world's largest private power company. It enjoys a near-monopoly for the provision of power to the world's largest metropolis, so this is no surprise.

TEPCO owns and operates 17 licensed nuclear reactors with several more in various stages of development. Ten of the company's reactors are located in two big complexes to the north of Tokyo on the Pacific coast of Fukushima, only 11.5 kilometers apart. The world's worst nuclear radiation crisis since Chernobyl emanates from only one, known as Fukushima No. 1 The other survived the earthquake and tsunami with no significant damage or radiation leak. The reason for the difference seems clear.

Fukushima No. 1 is one of Japan's oldest nuclear power stations. Construction began in 1967, and the four reactors in its main cluster came online throughout the 1970s. Fukushima No. 2 was planned and built about a decade later. Like most of Japan's nuclear power plants, both complexes were built on the coastline to provide ready access to large volumes of cooling water. The builders undoubtedly learned from the experience gained in the first complex. They showed more concern for tsunami risk the second time around. The main reactor buildings for Fukushima No. 2 were placed on land that is 15 meters above sea level, and the emergency generators were put inside the stout concrete walls of the same buildings that house the reactor cores, thus providing much stronger protection from the external shock of the tsunami. This strategy worked. The emergency generators at the Fukushima No. 2 complex survived the tsunami, and the reactors achieved

cool shutdown without significant problems.

Ring of Fire

The Japanese people live atop the so-called Ring of Fire, the giant arc that traces the Pacific coastline from New Zealand north to the Bering Sea and back down the western coastlines of the Americas all the way to Cape Horn. Ninety percent of all earthquakes take place somewhere along the ring (including all five of the Tohoku-class megaquakes recorded in the past half century) and 75 percent of the world's volcanoes are located here, too. All of the major islands of the Japanese archipelago lie along the ring. Minor earthquakes are commonplace throughout the country.

Every now and then, there is a big one. Prior to March 11, the most memorable recent quake was the 6.8-magnitude temblor that ripped through the city of Kobe in the early morning of January 17, 1995, bringing buildings and elevated highways and train tracks to the ground and killing more than 6,000 people.

The Kobe quake is memorable not only because of the massive damage and many human victims but because it was totally unexpected. Authorities were said to be unaware that a fault line ran beneath the city. It was the surprise of the Kobe quake that got officials started on the comprehensive review of safety standards to be discussed below.

But if this is such an earthquake-prone country, why did it build nuclear reactors at all?

National Policy

Japan is resource-poor. Nearly 100 percent of fossil fuels consumed here are imported. With a population of about 120 million people and one of the world's most advanced and largest economies, Japan imports large volumes of oil, coal and natural gas.

All Japanese political leaders and most ordinary people are painfully aware of Japan's dependence on foreign sources of energy. Anyone who is old enough also remembers an incident known as the oil shock of 1974, when the world oil price jumped by a factor of four within the space of a

few months. Shortages and price increases led to widespread panic in Japan, which even took the form of hoarding of basic consumer goods. The shock triggered a serious downturn in the economy.

Just as drivers were lining up at gas stations and shoppers were stripping the shelves of toilet paper and other daily necessities, the new TEPCO nuclear generators were coming online at Fukushima. Nuclear power promised liberation from the tyranny of uncontrollable world politics; it inspired the hope for some degree of self-sufficiency and abundant energy at a predictable cost.

With the passage of a series of promotional statutes in the 1970s, the race to expand nuclear power was on. National government officials joined power industry leaders in a campaign to expand nuclear power production. Using generous subsidies and the promise of tax revenues and even jobs building and operating the new plants, they persuaded poor fishing and agricultural communities to accept nuclear power plants in their midst. Although nuclear power produced less than 5 percent of the country's electricity at the time of the 1974 oil shock, by the mid-1980s the level had reached 20 percent and by the mid-'90s nearly 30 percent, where it has remained. Eventually, 54 nuclear power plants were built, and Japan became the third-largest nuclear power producer in the world. The deal struck between government and business leaders in Tokyo and residents of the countryside looked like a win-win; the nation was provided a secure source of power, and the locals received much-needed financial support. Of course, there was a catch.

SAFETY FIRST?

Production of nuclear power is an inherently dangerous activity. A single accident can present the threat of widespread harm. For nuclear power to truly serve the national interest, production must meet very high safety standards. Japan's nuclear reactors are owned and operated by private companies. In a capitalist system, their sole objective is to maximize profit. Business leaders sometimes take actions that imperil all of society. Ordinary people must rely on government agencies to impose safety standards to protect them.

An organization within the Prime Minister's Cabinet Office called the Nuclear Safety Commission (NSC) assures the Japanese people that the government maintains a high degree of safety in nuclear power generation through what it calls a "double check" system. An English statement on the commission's website describes this double check as "direct regulation of nuclear operators by government regulatory agencies (METI, etc.) and supervision/auditing of those agencies by the NSC."

"METI" refers to the Ministry of Economy, Trade and Industry, throughout Japan's postwar history one of the most important organs of the national government, credited by many with leading the country through the era of the postwar economic miracle that made Japan one of the richest countries of the world. Among its many duties, METI is charged with regulating power generation. This includes nearly all aspects of government involvement, from promoting development of new sources of power to approving licenses to build and operate and conducting safety checks and ordering repairs. METI performs its safety control function through a subordinate entity called the Nuclear and Industrial Safety Agency, or NISA.

In the double-check system, the NSC is merely an advisory body. Led by a team of five senior-citizen commissioners (typically retired college professors), the NSC issues advice and nonbinding guidelines. It has no power to issue orders to NISA, to power companies or to anyone else.

The true guardian of the public interest in safe power generation is NISA. According to its website, NISA has approximately 350 full-time employees, including 112 inspectors. It maintains offices at every nuclear power facility in the country, with separate offices at Fukushima No. 1 and No. 2. Prior to the tragedy, a team of eight on-site inspectors was assigned to maintain oversight of the six nuclear reactors of Fukushima No. 1.

TSUNAMI HISTORY

The 1995 Kobe quake was not the only recent reminder of the terrifying power of earthquakes. Others included the 6.8-magnitude quake that struck near TEPCO's big nuclear complex on the Sea of Japan at Kashiwazaki in 2007. (Although the vibrations exceeded the plants' design standards, there was little significant damage.)

On the other hand, a big tsunami is a rare event. Neither the Kobe nor the Kashiwazaki quake produced a significant tsunami. The immense destructive power of a great tsunami was demonstrated as recently as December 2004, when a quake in the Indian Ocean, centered about 250 kilometers off the western coast of Sumatra, sent massive waves throughout the region that killed more than 230,000 people.

Sumatra is a long way from northern Japan. The last time a giant killer tsunami struck Japan's northeastern coast was in 1933. Produced by an 8.4-magnitude quake with an epicenter about 290 kilometers offshore, it generated waves said to reach 28 meters, and it swept away more than 7,000 homes and killed more than 1,500 people. The great killer before that appeared in 1896 with an epicenter very near the 1933 quake. Like the March 11 quake, it produced extraordinarily big waves said to reach more than 38 meters. More than 22,000 people died. Most of the death and destruction from these tsunami occurred along the coast of Iwate prefecture, with the highest waves striking about 200 kilometers north of the site selected for the Fukushima nuclear reactors.

The history of destructive tsunami on Japan's northeastern coast is memorialized by "tsunami stones" bearing carved messages from ancestors warning residents of the danger to low-lying ground. Some residents have taken these messages very seriously and kept their homes on high ground. Others returned to the flat land below. As one precaution against the next tsunami, national, prefectural and local governments invested large sums in building concrete seawalls to keep the tsunami out. Most of the walls in the path of the biggest waves were overwhelmed on March 11.

Ordinary people were aware of the tsunami threat and took protective measures. What about the operators of Fukushima No. 1?

New "vibration resistance guidelines"

Although the NSC has no power to issue binding orders, it does produce nonbinding guidelines on important matters. Inspired by the Kobe quake, the commission set to work in the 1990s re-writing its guidance "concerning inspection standards for vibration resistance." Building consensus on complex matters takes time. Eleven years after Kobe, the job was done.

On September 19, 2006, the commission issued new guidelines embodying the first comprehensive revision since their adoption in 1981. The next day NISA instructed nuclear power operators to begin conducting "backchecks" to confirm their compliance with the new guidelines.

The 2006 guidelines focused on improved resistance to earthquake vibrations. They required reactors to be able to withstand higher levels of seismic force and to shut down at lower levels of ground motion. They also extended the application of the vibration standards to structures other than the main reactor buildings (including buildings housing pumps and emergency cooling systems). At the very end of the 14-page document, in the only reference to tsunami, the guidelines stated that nuclear facilities must be built to withstand tsunami "which are appropriate to expect during the operational life of the plant even though the possibility of such occurrence may be very rare." The commission provided no further guidance on what might be "appropriate to expect" (*sotei suru koto ga tekisetsu*).

"Nuclear Power Village"

Power company executives, friendly politicians, the NSC, NISA and other government agencies, the college professors who serve on advisory committees and other players have all collaborated to promote and expand nuclear power in Japan. This is no secret. Japan's business press commonly refers to this giant network as the "nuclear power village." There are countless connections among representatives of all village institutions. Power executives sit on government advisory panels to provide expertise. They are joined by professors from universities that receive research funding not only from the government but from the power companies, too. For their part, as they approach their 50s, senior government officials seek employment with companies under their purview in the practice known as *amakudari* ("descent from heaven").

NISA is the primary regulator charged with protecting the public. It exercises authority to issue (or withhold) licenses to operate, inspect nuclear plants in operation and order repairs and other measures when necessary. But NISA is embedded within METI, and METI's broader role is to ensure that the nation is provided with sufficient energy resources. Moreover, ex-

ecutives are circulated within different offices of METI. A prime example is Hidehiko Nishiyama, the man who was at the top of NISA when the disaster struck. Nishiyama took his current position in 2009; in his immediately preceding job, he was an executive in the Agency for Natural Resources and Energy (ANRE), the METI division specifically charged with promoting the development of power resources to support economic growth.

In the most startling example of *amakudari*, the head of ANRE (Toru Ishida) resigned in the autumn of 2010 and assumed a senior position with TEPCO in January 2011. It is likely that Nishiyama, the current head of Japan's nuclear safety agency, has spent his entire career in METI positions junior to the newly appointed TEPCO officer. In the aftermath of the disaster, Ishida was forced to resign from TEPCO.

As noted above, after it received the new vibration resistance guidelines from the NSC, NISA instructed plant operators to conduct "backchecks," a series of inspections and tests intended to show the facilities are up to the new standards. TEPCO submitted its first backcheck report concerning one of the six Fukushima No. 1 reactors in March 2008.

Outsiders

There are critics of Japan's energy policies, but they are either denied access to the village or listened to politely and then ignored. A small cadre of outsiders has tenaciously fought to bring safety questions before the broader public. This includes the antinuclear movement, led by a group called the Citizens Nuclear Information Center, founded by the late Professor Jinzaburo Takagi and others in 1975. But decades of government hostility toward unpredictable citizens' organizations have left Japan's community of nongovernmental organizations generally short of funds and political influence.

Small groups of citizens and lawyers also band together to bring suits demanding court orders to close reactors they believe to be especially dangerous. The most famous of these suits concerns a nuclear complex located at Hamaoka, only 200 kilometers southwest of Tokyo. A disturbing incident that illustrates the conflicts of interest running through the village featured the current NSC chairman, a retired University of Tokyo professor named Haruki Madarame. In February 2007, three years prior to his appointment,

Madarame appeared at Shizuoka District Court as an expert witness for Chubu Electric Power Co., which owns and operates the Hamaoka plant. When plaintiff attorneys asked him what would happen in the event the plant lost all sources of electricity, the apparently irritated professor blurted out, "If we took all these possibilities into account, we could never build anything." I do not know how this performance figured into Madarame's selection to lead the nation's most senior office charged with maintaining nuclear power safety.

We do know the result of the suit: As in nearly every other case challenging Japan's nuclear power plants, the court ruled in favor of the power company. In one of many great ironies surrounding the Tohoku disaster, Prime Minister Naoto Kan effectively overruled the court by requesting that Chubu Electric close the Hamaoka facility on May 6. The company board responded quickly and the shutdown was accomplished eight days later.

The industry is periodically rocked by scandals such as a criticality incident in 1999 at a nuclear reactor complex about 100 kilometers northeast of Tokyo. The incident resulted in the deaths of two workers and led to a criminal prosecution of power company executives. One of the best-known scandals led to the resignations of TEPCO's president and other officers. (The company later rehired them as advisers). This concerned a foreign whistleblower who reported to NISA that defects at Fukushima No. 1 were being concealed from regulators. NISA responded by relaying the complaint and the identity of the whistleblower to TEPCO itself to consider appropriate action. Later government investigations revealed that TEPCO had falsified numerous safety reports covering reactors at all three of its nuclear power complexes. President Nobuya Minami and other executives resigned to take responsibility.

The Jogan Earthquake and Tsunami of 869

According to Greek legend, the god Apollo bestowed on the beautiful Cassandra the gift of prophecy, but when she resisted his charms, he applied the curse that no one would believe the truths she foretold. Thus, the Trojans ignored her warnings of impending doom.

A government hearing on TEPCO's interim report about Fukushima No.

1 provided the stage for an eerie forewarning of the tragedy to come. At this June 2009 gathering, a METI official named Yukinobu Okamura presented research concerning another great tsunami that had appeared more than a millennium ago, in the year 869 (the Jogan earthquake and tsunami). Soil analysis and other work indicated that the waters from this tsunami had penetrated as far as three to four kilometers inland into the area of the modern city of Sendai. Sendai lies between the coastal zones to the north decimated by the great tsunamis of 1933 and 1896 and Fukushima No. 1, about 100 kilometers to the south of the city. The March 11 quake and tsunami are thought to bear many similarities to the Jogan monster of 869.

Okamura asserted that TEPCO's plans were inadequate to protect the Fukushima complex against tsunami waves of the size and location generated by the great Jogan quake and demanded better defenses. Like Cassandra's prophecies, however, Okamura's warnings were laid aside, perhaps to be considered another day.

According to comments of a NISA official published by the Associated Press after the disaster, NISA had never demanded that TEPCO explain its tsunami protection measures and had not conducted its own studies of what degree of protection might be "appropriate." Various published reports indicate that TEPCO assumed that tsunami waves would not exceed 5.7 meters. This official further said that NISA was about to begin a study of tsunami risks this year.

WHO'S TO BLAME?

The story of the Fukushima reactors is intimately tied to Japan's postwar pursuit of rapid economic growth. The most fundamental cause of the disaster is the boundless appetite for power needed to drive the economy.

Surely the die was cast when the first Fukushima reactors were built. Japan's nuclear industry was in its infancy. Contractors followed blueprints and designs provided by General Electric (GE), and GE sent technical staff to Japan to advise on construction. Perhaps the GE design team was not familiar with local tsunami risk and the Japanese contractors were overly focused on successfully completing their work according to GE's plans. Some have even suggested that the Fukushima No. 1 complex was a "learning ex-

perience" for Japanese engineers.

In accordance with the GE plans, the emergency power generators and water pumps were placed between the reactor buildings and the sea. Fukushima No. 1 continued in operation for more than 40 years. Despite local knowledge of tsunami history, the better plan developed for Fukushima No. 2 and a senior official's specific objections to the TEPCO report in 2009, neither TEPCO nor any agency of the Japanese government took action to address the risks at Fukushima No. 1. Just before the disaster, NISA renewed TEPCO's license to operate the complex for another 10 years.

The evidence suggests that regulators are under the thumb of the regulated and that critical voices are ignored. Japan's present regulatory apparatus is weak and constrained by profound conflicts. It is simply not up to the role of contending with the dominant force of the nuclear power village. Coastal communities built seawalls on the assumption that another great tsunami would come one day. TEPCO operated its Fukushima No. 1 reactors on the assumption that it would not. As long as the facility continued to generate power and profits, institutional resistance to change overcame the faint glimmering of tsunami risk. The people relied on public officials to protect them, but the officials failed.

The obvious lesson from the Tohoku disaster is that if we continue to rely on nuclear power, we must establish independent regulatory agencies free of the control of private corporations driven by profit and of the bureaucratic mindset that denies all challenge to conventional wisdom. It's not clear that this is possible. Humanity may have learned the science necessary to dominate the forces of nature to produce nuclear power, but it has not yet evolved the human structures needed to ensure that this science is applied safely.

In the aftermath of disaster, many have called for Japan to establish an independent nuclear regulatory agency. But the U.S. experience suggests that this is much easier said than done. The U.S. Nuclear Regulatory Commission became an independent agency in the 1970s, but critics frequently cite that NRC as an example of "regulatory capture" in which industry, with big budgets for Washington lobbyists, political contributions and the American version of *amakudari* (sometimes called "the revolving door"), is able to exert significant control over the regulatory agenda.

Moreover, the notion of an independent regulator with power to impose its will on large establishment organizations is anathema to Japan's system of governance. Perhaps the Financial Services Agency, created in the late 1990s following the collapse of the oligopoly that ruled Japan's financial industry throughout the postwar era, provides a model.

As I write this, the radiation continues to spread. Two months after the earthquake and tsunami, TEPCO personnel have only begun to enter the contaminated buildings to find out what really happened. Meanwhile, another earthquake or other uncontrolled force could appear at any time and reverse the progress made to date. For now, the priorities are the fight to reestablish control over the Fukushima reactors and the provision of food and shelter to hundreds of thousands of tsunami victims. It is not clear when Japan's leaders will be free to focus on reform of the nuclear regulatory structure or what conclusions they may reach.

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HOW AMERICAN NUCLEAR REACTORS FAILED JAPAN

BY ANDREW HORVAT

What does Astro Boy have to do with the failed nuclear reactors at Fukushima? Plenty. The rise in popularity of the pop culture icon starting from the early 1950s closely parallels the gradual acceptance by the Japanese public of nuclear power as a source of electrical energy. Astro Boy both promoted and reflected optimistic visions of prosperity through atomic energy typical both in Japan and the United States in the latter half of the last century. After all, the cute little robot with rockets for legs is known in Japan as *Tetsuwan Atomu* (Powerful Atom). His little sister is *Uran* (uranium), and his brother is *Kobaruto* (Cobalt). There is hardly anyone in the "nuclear family" not entirely radioactive. All these characters offered pleasant distractions from the political infighting and bureaucratic turf wars that ultimately saddled Japan with nuclear generating equipment that was neither the safest nor the most efficient but that, at least until March 11, proved to be highly profitable for this country's entrenched utilities.

The origins of the Fukushima reactors — and the reasons for the disaster they have caused — can be traced to the Cold War, when the United States came to use the dream of prosperity through the magic of the atom as a diplomatic tool to strengthen the "free world" in its struggle against the Soviet Union. The idea of harnessing nuclear energy to generate electricity and to make nuclear technology available to all of humankind originated in President Dwight Eisenhower's famous Atoms for Peace speech at the United

Nations on December 8, 1953. Eisenhower told the General Assembly that if the race between the Soviet Union and the West to build ever more powerful atomic weapons could be reversed, "this greatest of destructive forces can be developed into a great boon for the benefit of mankind." He singled out a special role for the atom, namely to "provide abundant electrical energy in the power-starved areas of the world."

At first glance, Japan in the 1950s appeared to be an ideal testing ground for the application of the atom to generate electricity. The country was resource-poor, was recovering from the ravages of war, had scientists familiar with nuclear technology and had leaders who saw in atomic energy a potential success story that could catapult them into high office. Yasuhiro Nakasone, a leading light of a small conservative party, was one of these rising stars, and Matsutaro Shoriki, president and owner of the *Yomiuri* newspaper and its broadcasting affiliate, Nippon Television, was another. A few months after Eisenhower's speech, Nakasone would usher through the Japanese parliament the nation's first atomic energy law, complete with budgetary allocation. Shoriki, a former Class A war-crimes suspect turned CIA ally, would become the first head of Japan's Atomic Energy Agency.

But, in spite of all these seeming advantages and to some degree because of them, the introduction of nuclear power to Japan would forever be seen in Cold War terms, actively promoted by a pro-American right wing and equally energetically opposed by the left. Typical of the difficulties faced by proponents of nuclear power in Japan was the outburst of anti-American feeling within months of the Atoms for Peace speech when the crew of the Japanese tuna-fishing vessel *Lucky Dragon No. 5* were exposed to massive doses of radiation from an American hydrogen bomb test over the Pacific Ocean near Bikini Atoll. While the radio operator of the doomed fishing vessel lay dying in a hospital, some 30 million Japanese signed a petition demanding an end to American hydrogen bomb testing.

A National Security Council paper in 1955 described the aim of the Atoms for Peace policy as "to strengthen American world leadership and disprove the Communists' propaganda charges that the [United States] is concerned solely with the destructive uses of the atom."[1] But, the policy encountered hurdles from the start. To begin with, at the time of Eisenhower's speech no one had yet connected a nuclear reactor to an electricity

grid. Written two years later, the NSC report stated that U.S. nuclear reactor programs were "unlikely to produce economically competitive atomic power for a decade or more." (Just how much of a dream civilian application of nuclear technology still was in the 1950s can be seen from a viewing of Walt Disney's 1957 program "Our Friend the Atom," in which the show's physicist host, Heinz Haber, predicts the advent of atomic powered aircraft that will not have to land to refuel. Haber did not bother to explain why anyone would want to travel forever in an airplane without landing or for that matter how a nuclear reactor could be made light enough to propel a plane.)

Though Japanese often take pride in their ability to promote internal harmony, a consensus on the use of nuclear power always eluded Japanese society. Japan's only Nobel Prize-winning physicist at the time, Hideki Yukawa, dissociated himself from the nuclear power program from the start. In 1956, Yukawa threatened to resign after Shoriki, by then head of Japan's Atomic Energy Commission (AEC), publicly announced without any prior discussion at the AEC a plan to build nuclear power plants. Persuaded not to pull out just then because as Japan's most prominent physicist his sudden departure would result in adverse publicity, Yukawa would step down the following year citing "ill health."[2] By then Yukawa was the only major scientist still associated with the Japanese government's nuclear energy program. All others had distanced themselves from government scientific policies in large part from disillusionment with what many saw as a hastily conceived plan to promote economic prosperity through imported technology. They demanded more investment in basic research.

For Shoriki, however, the clock was ticking quickly. Recognizing that after the *Lucky Dragon* incident public support for peaceful application of nuclear technology was lacking, he mobilized his media empire to begin promoting a more favorable image of the atom. Even before the incident, on January 1, 1954, the *Yomiuri* newspaper ran a front-page story titled "Capturing the sun" pegged on the Atoms for Peace speech. In December 1955, Shoriki cooperated with U.S. diplomats in organizing a six-week exhibition in a downtown Tokyo park to promote the peaceful use of the atom. Here too, Shoriki's media empire played a key role. Some 360,000 visitors, including schoolchildren, saw the exhibits. CIA reports at the time described the exhibition as a great success.[3]

However, improving America's image in Japan was not Shoriki's number-one goal. He wanted nuclear power generated on Japanese soil in time for him to reap the benefits and become prime minister. A CIA report describes Shoriki as so impatient that he asked to have the demonstration reactor on display at the exhibition delivered to his home, thinking apparently, or so the CIA report claims, that he could use it to generate electricity for his family. Shoriki's haste, his alienation of experts and his bombastic personality brought about a temporary rift with the U.S. on nuclear technology, resulting in a single, one-time importing of a non-U.S. reactor, a gas-cooled, graphite-moderated Magnox from Britain.

Lax attitudes toward safety can be traced to the Magnox, not that the reactor was any more or less dangerous than others at the time. Graphite-moderated reactors such as the Magnox, similar though not identical to the Soviet reactors of the type at Chernobyl, were notoriously unstable. Britain had just experienced radiation leakage from a Magnox and therefore informed Shoriki that it would not take responsibility for any accidents. Not only would this not deter Japanese utilities from importing the Magnox, but the contract would set a precedent for no-liability contracts in purchases of nuclear power plants from the United States. The GE-designed power plants at Fukushima Daiichi conformed to this pattern. One consequence of such arrangements is that legal responsibility to compensate residents of villages in the evacuation zones around the crippled Fukushima plants is now in dispute. The Japanese government is demanding that Tokyo Electric Power Co. (TEPCO), the operator, bear the brunt, while TEPCO executives point a finger at the government.

The American light-water reactors (LWRs) were superior in design to the Magnox, but both types were beholden to their military origins. The Magnox was intended to produce plutonium for the British nuclear weapons arsenal, and the American LWRs ran on enriched uranium and required high-tech, high-pressure containment vessels because they had to be compact enough to fit into nuclear submarines. As German nuclear engineer Heinrich Bonnenberg has written, "The LWR … [was intended for an] environment where water for cooling was always at hand and where there was no human population."[4] Bonnenberg, an advocate of the German-designed high-temperature reactor (HTR), blames LWRs for giving nuclear

energy a bad name. Putting the submarine-type reactors on land where water was not always available as a coolant and near population centers "was an abuse of a military achievement to create an unsafe, bad design for the electricity industry not to mention the low energy efficiency."

The far more stable and highly efficient Canadian-designed Canadian deuterium uranium (CANDU), or heavy-water, reactor (HWR) would be available in a very short time, but Japan would become the only country in East Asia not to buy one. Four of South Korea's 20 reactors are CANDUs; China is building two, and Taiwan has had a Canadian-supplied HWR since 1969. Fourteen of India's 16 nuclear power plants are based on the design of a CANDU-type research reactor provided by Canada in the 1960s. A powerful argument can be made that had Japanese utilities phased out their old-fashioned LWRs, such as the ones at Fukushima Daiichi which had been scheduled for decommissioning, and had they introduced CANDUs in the 1970s and 1980s, the added efficiency of the HWRs would have made it unnecessary to build so many power plants and would have increased safety significantly.

For one thing, the only fatal nuclear accident in Japan so far, a 1999 incident at the Tokai-Mura enrichment facility, could have been avoided. The CANDU runs on natural uranium and does not require enrichment.[5] But quite aside from that, there would not have been meltdowns of the kind that happened at Fukushima. Because the CANDU uses a heavy-water moderator, which absorbs fewer neutrons than light water, less fissile material is required to achieve a controlled chain reaction; hence natural uranium is sufficient. Moreover, as there is less fissile material around, the danger of a meltdown is significantly lower.

"The CANDU is not prone to meltdowns," said Atsushi Kasai, former laboratory chief of the Japan Atomic Energy Agency. As to why the CANDU was not introduced after years of deliberation by Japanese government agencies and utility companies, Kasai added, "We scientists were never consulted on reactor types. Such decisions were always made elsewhere."[6]

There appear to be several reasons why Japan did not import a single CANDU (although it did for a while run its own HWR, a research reactor called the Advanced Thermal Reactor; it too was shut down). According to Keiji Miyazaki, professor emeritus of nuclear engineering at Osaka Univer-

sity, cost was a major factor in saying no to the CANDU. Heavy water was expensive to produce: "We used to joke that price per unit of heavy water was the same as premium Scotch whiskey."[7] In the 1970s Japan still levied high import duties on liquor.

CANDU's biggest drawback was that it was not American. By the mid-1970s, when the Ministry of International Trade and Industry (MITI) approached the Atomic Energy of Canada to begin discussions to import CANDUs, the burgeoning Japanese trade surplus was already triggering resentment in the United States. Moreover, the inherent simplicity of the CANDU seemed to offer arguments against its introduction. Would it lead to future technology improvements, such as the fast-breeder reactor, which promised to produce more fuel than it consumed? After all, the CANDU was designed to run on unenriched uranium because Canada lacked enrichment know-how. The CANDU's designers chose a low-pressure containment vessel or calandria because in the 1950s Canada did not have heavy industries that could produce equipment of the kind needed for the much-higher-energy LWR. In the end, according to both Japanese and Canadian sources close to the negotiations, the CANDU fell victim to a bureaucratic turf war between MITI and the Science and Technology Agency (STA, which had taken over responsibility for the Atomic Energy Commission. In 1977, when MITI announced that the Electric Power Development Corporation, a MITI affiliate, would introduce the CANDU to Japan, STA officials were miffed and proceeded to oppose all attempts to do so.

There were other, more embarrassing reasons as well. In the late 1960s, after the United States lifted restrictions on sales of enriched uranium to Japan, Japanese industry began to build U.S.-designed LWRs under license. Investment in nuclear energy took a great leap ahead in 1974 after the oil shock. At the time, Japan depended more than 50 percent on oil imported from the Persian Gulf. But the locally built LWRs were plagued with problems from the start. Japanese LWRs were being operated at 50 percent of capacity while CANDUs were garnering world records running at more than 80 percent.[8] (The CANDUs did not have to be shut down for refueling and could be run continuously for 18 months at a time. Even today, when LWRs have become more efficient, Japanese regulations require reactors to be shut down for two months every 14 months.) As one former bureaucrat

explained, "The main opposition to the CANDUs came from utilities and heavy industries afraid of being criticized for having made a wrong decision in going with LWRs. The last thing they wanted was a simpler, more efficient reactor."

The decision against importing the CANDU after more than a decade of vacillation offers an opportunity to analyze Japan's policy priorities in nuclear energy. They would appear to be close ties with the United States, diversification of sources of energy supply, strong bureaucratic control and localization of foreign technology with a view to promoting future exports. Safety and efficiency do not appear to be on the list.

Were one to be rude, one might add that greed and complacency also played a role. We now know that TEPCO had enormous financial resources and that executives had every opportunity to increase safety at the aging Fukushima plants. TEPCO had been warned to prepare for a tidal wave significantly higher than Fukushima Daiichi's 5.6-meter retaining wall. The poor design features of the Fukushima plant — the fact that spent fuel was stored inside the reactor housing and that emergency diesel generators were installed in the basement of the turbine buildings where they would be flooded — were all pointed out at various times.

A nonmainstream publication, *Shukan Kin'yobi* (Weekly Friday), accused TEPCO of spending money not on emergency preparedness but on payments to 25 prominent public figures to appear in advertising aimed at persuading consumers that safety was a high priority for the electric utility.[9] Chief Cabinet Secretary Yukio Edano demonstrated that he understood public sentiment when he said on television that TEPCO and not the taxpayer should be made to pay for the damage and disruption caused by the failed reactors. His statement came roughly at the same time as news reports detailing the real estate and other holdings TEPCO would sell off to raise Y100 billion ($1.2 billion) just to stabilize four damaged reactors.[10] The assets included some 33 holiday resorts and retreats for use by TEPCO employees, including senior executives. The utility also promised to eliminate 21 directorships, given to former executives and company friends who were required to do little to deserve lavish remuneration and copious perks.

Serious nuclear engineers such as Bonnenberg are also upset and with good reason. Bonnenberg echoes the remarks of Kasai when he writes, "The

energy industry and politicians valued profitability over safety. They built unsafe nuclear power plants with light-water reactors based on a faulty design…. Due to the disaster in Fukushima, people have lost confidence in all nuclear energy technologies…."

It is not a coincidence that the relatively safe HTR reactor that Bonnenberg champions and the latest version of the CANDU are being built in China. Renewable energy may be the wave of the future, but safer nuclear reactors are needed to fill the gap. In the 1980s, Osamu Tezuka, the cartoonist who created Astro Boy, replaced the nuclear reactor in his robot hero's chest with a reactor using deuterium, the D in CANDU. Had TEPCO executives only paid more attention to the exploits of Astro Boy.

Andrew Horvat is a Japan-based journalist who worked as a correspondent for the Associated Press, the Los Angeles Times *and the* Independent *of London.*

Endnotes

[1] NSC, "Peaceful Uses of Atomic Energy," NSC-5507/2, March 12, 1955, pp. 2, 7. As quoted in Lavoy, Peter R. "The Enduring Effects of Atoms for Peace," Arms Control Organization.

[2] Low, Morris F., "Japan: The Political Economy of Japanese Science, Nakasone, Physicists and the State," in Etel Solingen ed., *Science and the State*, University of Michigan Press, 1994. P 105.

[3] For information on the role of Matsutaro Shoriki as head of the Japan Atomic Energy Commission and as a CIA operative I have relied on Arima Tetsuo's *Genpatsu, Shoriki*, CIA, (Nuclear Power Plants, Shoriki and the CIA), Shinchosha, Tokyo, 2008.

[4] Bonnenberg, Heinrich, "The Era of Nuclear Energy is Over," Atlantic-Community.org.

[5] The latest version of the CANDU, the ACR1000, uses fuel that is "slightly" enriched, to about one quarter to one half of levels for LWR needs.

[6] Interview with author.

[7] Interview with author.

[8] To this day, the median performance of Japanese LWRs stands at 70 percent, about 20 percent below the best rates in the world. "Nuclear Power in Japan," http://www.world-nuclear.org.

[9] *Shukan Kin'yobi* April 15, 2011, p.14-19.

[10] "TEPCO to Sell Y100 bn in Assets," *Daily Yomiuri Online*, April 16, 2011.

CAN TEPCO SURVIVE?

BY PAUL J. SCALISE

There is something disquieting about uncertainty. The tragic events of the March 11 earthquake-tsunami in northern Japan may have momentarily captured world attention but soon lost it. What lingered was the television spectacle of Fukushima Daiichi nuclear power station, owned and operated by Tokyo Electric Power Co. (TEPCO). Beleaguered by an ongoing nuclear crisis now rated on par with Chernobyl, TEPCO's share price has collapsed by 90 percent in just three months as the company failed to contain the situation.

Talk of nationalization, bankruptcy and delisting persist as investors, journalists and analysts ask the same question: Can TEPCO survive? The answer to that question largely depends on a single legal clause in the Law on Compensation for Nuclear Damage (Law No. 147, June 17, 1961). If TEPCO's lawyers do not pursue it aggressively, insolvency risk grows by the minute. But don't expect a vigorous defense of the company's legal rights in the courtroom of public opinion; TEPCO's fragile market brand is also at stake.

For decades, the company managed to build a loyal customer base by projecting the image of strength and reliability. A quick look at the surface conveyed that impression: TEPCO served more than 28.6 million customers across nine prefectures with Y12.6 trillion in assets on its balance sheet. In reality, TEPCO was a paper tiger — a highly leveraged house of cards held together by trust and respect. High electricity prices were the tradeoff for a predictable source of electric power, stable dividend payouts and lifetime employment.

Today, the very things that protected TEPCO in the past (stable supply) risk bankrupting it in the future — an ironic twist of events in which the country's largest power company is now a potential victim of its own effective marketing. How did this happen? Is there any hope for the company's stakeholders and shareholders? And what does it teach us?

STABILITY AS IMAGE

Like the mythical phoenix, TEPCO was born in May 1951 out of the ashes of Japan's wartime mega utility — the Japan Electric Power Generation and Transmission Co. (*Nippon hassoden kabushiki gaisha*, or Nippatsu) and one of the nine electric power distribution companies (*haiden*). A vertically integrated company listed on the 1st Section of the Tokyo Stock Exchange, TEPCO exclusively specialized in the generation, transmission and distribution of electric power in the Tokyo metropolitan area for more than 40 years before it began to diversify its businesses.

Because Japan was constrained by a lack of natural resources, TEPCO built power plants based on what was technologically feasible, legally permissible and economically prudent. Over time, this situation gyrated from one power source to another. Coal and hydroelectric power were the most cost-effective endeavors for the first half of the 20th century. Cheaper, oil-fired thermal power generation replaced them thanks to oil import liberalization in 1961. When the oil shock of 1973 drove up oil prices by 660 percent, TEPCO's overexposure to oil increased fuel costs and electricity prices to unprecedented levels. With energy-intensive industries hurt and the economy threatened, the national response was to accelerate plans to build price-competitive capacity that promised stability. Between 1973 and 1995, TEPCO raced to build nuclear and conventional power plants that drove up construction and operating costs while continuing its electrification of the Kanto region.

Had the global push for electricity deregulation not visited Japan, this situation would have likely been manageable via increased electricity prices. But in 1995-2003, the country opted to restructure the sector in the name of competition-induced lower electricity prices, increased efficiency and greater transparency. TEPCO was forced to change its marketing strategy.

Enron Corp. was one of the first and most vocal new entrants to cash in on this environmen.[1] Its plans to enter the market were greeted with enthusiastic media headlines. Enron, the *Nikkei Weekly* punned, "plans to power into the local market." "It is the age of Enron," declared Hashimoto Naoto, top-ranked Japanese utilities analyst at Nomura Securities. "We don't go in and try to destroy markets," insisted Joseph Hirl, president of Enron Japan, "... we go in and create them."[2]

Such rhetoric was both outspoken and confrontational. Yet for all its bluster, Enron Japan failed to attract many willing customers. "No one was willing to give up any of their surplus generating capacity," explained one interviewee. "The company was forced to build."[3] "We could procure only 50 to 60 percent of the electricity we needed, and we were forced to revise our business model," a rival new entrant complained.[4] Six months before filing for bankruptcy in the Tokyo courts, a reportedly "irritated" Enron Japan vice president, Nicholas J. O'Day, went so far as to hold a press conference to air publicly his frustrations.[5] "There's no real competition in the [Japanese] power market," he concluded.[6]

THE ELEPHANT IN THE ROOM

TEPCO holds an 84-percent share within its own service region, with new entrants and industrial self-generators slowly capturing greater market share since electricity liberalization in March 2000. Real competition may not exist, but what saved the incumbent power companies from cutthroat competition was neither a miracle nor direct government intervention; what saved them was the perception of stability and reliability among their customer base — something companies like TEPCO managed to project with impressive ease.

The question today: Will it continue to work? Aside from the nuclear crisis, the elephant in the room that everyone knows well but dares not emphasize is the looming electricity crisis. Japan needs to restore capacity before the peak-load summer months. Certainly the explosions and attempts to flood the Fukushima Daiichi reactors with seawater to cool their radioactive cores (thereby permanently corroding them) have made this capacity useless.

What is less publicized is the amount of damage to facilities other than Fukushima Daiichi. On the nuclear front, 13 of TEPCO's 17 reactors (generating 12,396 megawatts, or MW) went offline. Seven TEPCO reactors were automatically shut down due to the earthquake on the eastern seaboard; six other reactors (three at Fukushima Daiichi and three at Kashiwazaki-Kariwa) were already offline for regular inspection, disabling 71.6 percent of the company's total nuclear capacity.

If history is any guide, these nuclear reactors will not come back online before August 2011 or indeed before the end of the year. After the July 2007 Chuetsu offshore earthquake (magnitude 6.6), extreme caution from both the regulator and the local government spurred numerous safety tests that delayed reopening the undamaged reactors for 16 months — with some still being offline before the March 11 quake.

Further nuclear build in the immediate future is also unlikely. TEPCO already announced a halt to work on a 1,385-MW reactor at the Higashidori plant in Aomori, northern Japan, and suspended plans to build another 1,385-MW reactor at the same plant as well as two 1,380-MW units at the stricken Fukushima Daiichi plant.

The need to placate underlying not-in-my-backyard sentiments of the local population places greater pressure on TEPCO to correct the supply-demand imbalance by using conventional thermal power plants. Unfortunately, acquiring additional thermal power fueled by oil, gas and coal is where the largest privately owned utility in Japan also faces its greatest challenge in avoiding rolling blackouts.

ALLOCATION INEFFICIENCIES

Conventional power sources were seriously affected by the earthquake. Immediately following March 11, TEPCO reported 23.7 percent (9,205 MW) of its conventional thermal power capacity — in addition to the 71.6 percent of its nuclear capacity and 22 hydroelectric dams in three prefectures — as disabled due to earthquake-related damage. Because of the unprecedented effect on TEPCO's facilities, a record-breaking 2.4 million households faced blackouts with some residential customers not seeing power restored until March 19.

Purchasing power from neighboring power companies will not suffice. First, Japan's unique hertz (Hz) system — an accident of history — ensures that TEPCO's western counterparts cannot help much. From Okinawa to Chubu stands the 60 Hz system, a holdover from the 19th century when Osaka Electric Light Co., founded in 1888, began distributing alternating-current generators made by General Electric (GE) of the United States. On the eastern portion of Japan from Hokkaido to Tokyo spans the 50 Hz region inaugurated by Tokyo Electric Light Co. (TELC) in 1883. TELC distributed generators made by Allgemeine Elektrizitats Gesellschaft AG of Germany. The cutthroat competition of Japan's highly fragmented and largely unregulated electricity market until 1911 guaranteed that the frequency mismatch could not be corrected without incurring large costs to the system. Consequently, only 1,000 MW can be transferred today from Chubu Electric Power Co. to TEPCO through converters. Second, Tohoku — with 53 percent of its own capacity currently disabled — faces even greater problems than TEPCO.

Nor will wholesale suppliers, new entrants or self-generators likely be the blazing saddles of rescue that some commonly suppose. Wholesale suppliers (e.g., Japan Atomic Power Co. and Electric Power Development Co.) continue to sell power to their main customers in the region — TEPCO and Tohoku — at maximum load. There is not much more that they can generate. Companies such as Diamond Power, Ennet and Marubeni also sell at the retail level in Japan's newly liberalized electricity market, but these 35 new entrants are small in capacity and limited in surplus power. This leaves some market watchers to place their faith in self-generators, or *jika-hatsudensha*, of the private sector to restore balance. The Kanto and Tohoku regions provide some 21,000 MW of self-generation to energy-intensive industries. How many generators can be purchased, redirected or connected to the eastern grid system is unknown.

Declining Reserve Margins

Historically, the frequency and duration of Japan's blackouts have been relatively few and modest, suggesting little future worry. The average annual duration of forced outages in TEPCO's service area over the past de-

cade, for example, records slightly over four minutes per household versus 69 minutes in the U.S., 73 minutes in the United Kingdom, and 45 minutes in France.

Analyzing TEPCO's reserve margin, or *kyokyu yobiritsu*, reveals a more unsettling story. The electricity reserve margin is a useful in forecasting blackout risk (see Fig. 1) and therefore the effect on economic activity. It is the amount of unused available capability of an electric power system at peak demand, or peak load, measured in megawatts for a utility system as a percentage of total capability. TEPCO's recorded winter and summer reserve margins illustrate a growing problem over the past 30 years. Summer peak demand in August — when air-conditioning use is at its height — continually chipped away at maximum supply, thereby yielding lower reserve margins each year.

Energy economists agree that the optimal reserve margin is 15 to 20 percent. Anything above that figure is inefficient excess; anything below it sounds alert warnings. TEPCO's summer reserve margins have faced a gradual downward decline since the late 1970s and have fallen as low as 1.8 percent in 2007. Why?

Part of the problem lies with simple forecasting error; both TEPCO and its regulator misjudged electricity demand in summertime. In addition to increased air-conditioning use, the demands of a postmodern industrial society lead to mounting usage of household electrical appliances, kitchen units and heating systems. Predicting the erratic and sometimes irrational behavior of 13 million Tokyoites can never be easy.

But a more pervasive problem stems from what political scientist Daniel P. Aldrich calls "the site fights for public bads." Local opposition, compensation negotiations and media scrutiny in the siting, licensing and construction of nuclear power plants and hydroelectric dams have resulted in protracted lead times. Indeed, the building of conventional thermal power plants fueled by oil, natural gas and coal is constrained by stringent environmental regulations and zoning laws that protect against pollution, carbon emissions and a negative effect on local wildlife. Consequently, lead times range from three years for small 300-MW thermal plants to as high as 20 years for nuclear plants of 1,000 MW or more.

THE NEVER-ENDING PROBLEM

Given these and similar problems, TEPCO painfully transformed from the "secretly sick man of Japan" to the walking undead in a matter of months. Ratings agencies downgraded TEPCO's debt to junk status as a result of its high default risk. The possibility of delisting took the market by storm yet again, putting further downward pressure on its share price.

For the past 10 years, the company's generated cash flow has slowly but surely declined. Falling electricity prices in a liberalized market, stagnant demand growth, rising operating costs and unforeseen natural disasters plague the company. Little by little, TEPCO has been forced to increase its borrowing to meet its obligations. Perhaps the most ironic of all, TEPCO has been forced to trade on its brand name. The remarkable loyalty of its customers, creditors and regulators guaranteed that virtually any cost in the siting, licensing and construction of controversial power plants could eventually be passed on to its loyal customers while the company relied on low-cost corporate bonds, bank loans and commercial paper to fund mounting capital expenditures in the short term.

The Law on Compensation for Nuclear Power Damage suggests that "the government shall give a nuclear operator ... such aid as is required for him to compensate the damage, when the actual amount which he should pay for the nuclear damage ... exceeds the financial security amount and when the government deems it necessary in order to attain the objectives of this act."[7]

TEPCO is well aware of its legal rights. It is also well aware of the market and commercial realities. Press too hard and you risk alienating your customer base and the delicate tapestry of public opinion. Don't press hard enough and your company's viability, its shareholders and eventually its legacy will be lost. What to do?

At the time of writing, TEPCO now trades at only Y200 a share. Both the market and the country increasingly view this situation with dread. Time is running out.

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of the original titled "Looming electricity crisis: three scenarios for economic impact," Oriental Economist*, Economic Outlook, Vol. 79, No. 4, April 2011, pp. 8-9.*

Endnotes

[1] Enron was active in the Japanese electricity market via two companies. The first, EnCom Corp., also known as "E-Power," was the planning scout through which the company bought, developed, owned, and operated electric-power-related facilities. The second was Enron Japan — a subsidiary focused on merchant activities such as finance, e-commerce, commodity trading, and risk management. EnCom first made gestures toward entering the Japanese market in 1999. For the sake of simplicity, any reference to Enron in the Japanese market will beis labeled as "Enron Japan."

[2] Bethan Hutton, "Foreign investment in Japan: Texan mounts aggressive campaign," *Financial Times*, November 17, 2000.

[3] Ibid.

[4] Natsuko Segawa, "Power deregulation fails to connect," *The Nikkei Weekly*, September 25, 2001.

[5] Ibid.

[6] Power in Asia, "Enron ire over Japanese 'lack of competition'," FT Energy Newsletters, May 15, 2001.

[7] Article 16, Law on Compensation for Nuclear Power Damage.

MOVING OUT OF THE "NUCLEAR VILLAGE"

BY ANDREW DEWIT AND MASARU KANEKO

More than two months after the March 11 earthquake and tsunami, Japanese politics and policymaking remained focused on the nuclear meltdown at Fukushima Daiichi. Japan's Kanto region — centered on Tokyo and home to 40 percent of the country gross domestic product — confronts a grave problem of power deficiency, one whose scale depends largely on the degree to which the hot summer drives up demand. The shortage arises from having so much wrecked or idling nuclear capacity. Fukushima No. 1 and No. 2 house 12 nuclear reactors with a combined 10 gigawatts of electrical generating capacity, roughly one-fifth of Japan's total of about 47 gigawatts of nuclear generating capacity. Several of Fukushima No. 1's reactors are write-offs whose disposal may take decades, while Fukushima No. 2's capacity is offline for perhaps a very long time. There is also significant damage to the regional transmission grid and a good deal of thermal (i.e., coal, gas and oil) generating capacity.

The Democratic Party government, under Prime Minister Naoto Kan, and the corporate owner of the reactors, Tokyo Electric Power Co. (TEPCO), compounded the disaster through often poor and conflicting communication of the facts. Japan's international reputation for quality and safety has suffered an enormous blow while the economy and business/consumer sentiment are contracting at a disturbing pace. Fukushima and its aftershocks are liquefying the political landscape of Japanese power production and energy policy.

Fukushima's ruined and ruinous reactors are the most visible legacy of vested interests' dominance of Japan's energy policy. Key actors in this "nu-

clear village," as it has now widely come to be known, are Japan's 10 monopoly utilities that have the country divided into their respective fiefs. They cooperate closely with bureaucrats in the Ministry of Economy, Trade and Industry (METI) and elsewhere in the state as well as with a broad swath of the political class. Management and labor in some of Japan's biggest blue-chip firms, including power-unit builders Toshiba, Hitachi and Mitsubishi, are part of the village. So too are large numbers of influential figures in media, academe and elsewhere. Their tightly focused priorities and capacity to dominate debate in the corridors of power have driven Japan to, as it were, bet the farm on nuclear power.

2010 Basic Energy Plan

Indeed, this disaster has derailed a nuclear-centered energy policy that was running at full speed. The past decade's surge of fossil-fuel prices and geopolitical risks saw Japan's imports of these resources climb from about 1 percent of GDP in 2003 to 4.8 percent in 2008. Rising prices and growing political instability helped the nuclear village secure a national commitment to nuclear power as the only real energy alternative. At present, Japan gets close to 30 percent of its electricity from nuclear reactors. Its 2010 Basic Energy Plan aims to raise this share to about 50 percent of electricity by 2030. To this end, the authorities propose to construct nine new nuclear plants by 2020 and at least 14 by 2030. Longer-term goals include the ambitious one of securing 60 percent of all energy needs, not only electricity, from nuclear sources by 2100. That would be a sixfold increase over the present 10 percent and was touted as critical for cutting Japan's CO2 emissions by 90 percent from 2000 levels.

Japan's 54 nuclear reactors, all sited on the coastline, are the key element in a regionally centralized power production and transmission network that is shockingly vulnerable to the country's frequent earthquakes and tsunami risk. The power industry overall is vertically integrated in its regional silos and regulated by the largely coopted Nuclear and Industrial Safety Agency, which oversees regulatory compliance from within METI. In other words, the regulator is part of the government agency — METI — that is most committed to expanding nuclear power. This organizational design is hard-

ly conducive to transparency and accountability, as has become clear in several weeks of intense media coverage. Energized by international outrage over radiation releases and the nuclear village's efforts to obfuscate, the Japanese media have richly detailed TEPCO's long record of regulatory abuses and outright corporate fraud. They have also elucidated in striking detail the village's dense network of pecuniary and personal relations.

"Back to Scratch"

The juggernaut derailed, Japan's entire energy policy has been hauled back to the drawing board. Even nuclear's strongest proponents have conceded that fact and are seeking to regroup. The May 6 *Tokyo Shimbun*, a Japanese daily, noted that METI has drafted an internal document titled "Safety Declaration." This document aims at maintaining power production from the existing nuclear reactors and achieving "the world's safest nuclear energy" between 2030 and 2050. But the "declaration" also shows that the continuing shock of the reactor meltdowns has already compelled METI to downgrade the role of nuclear power from the center of the "energy best mix" to one among three pillars. The first pillar is solar power and other renewables. The second pillar looks to reform of lifestyles as well as the industrial structure to achieve lower energy consumption. And the third pillar is "the world's most secure nuclear power."

Also on May 6, Kan requested that Chubu Electric, the monopoly utility in Japan's Kansai area (which includes Osaka), shut down its three reactors at its Hamaoka facility in Shizuoka prefecture. The reactor complex is in an area vulnerable to a massive earthquake forecast in the not-too-distant future, so Kan asked that the reactors be shut down until adequate safety measures can be installed. This movement away from nuclear power was given even more momentum on May 10. At a major press conference, Kan announced he would commit Japan to increased conservation and to adding "renewable and natural energy sources such as solar, wind and biomass power … to our core energy sources." In the meantime, METI also moved the scheduled spring 2013 revision of Japan's Basic Energy Law to as early as March 2012.

TEPCO and the other elements of the nuclear village are certainly keen

to keep the nuclear-centered energy policy on track and continue ramping up capacity to meet that 2100 target of 60 percent of total energy supply. But the constraints posed by the present crisis seem quite forbidding. TEPCO effectively painted itself into a corner when it decided that the weak safeguards in Fukushima were adequate. Complacent in a collusive regime, it opted to overlook the remote but real risk that a very big seismic event might leave it politically exposed as well as unable to satisfy power demand. The nuclear village's core argument is that it offers low-cost, reliable power essential for the functioning of a modern and competitive economy, particularly one that needs to act on climate change. But those claims are rapidly losing credibility in the public debate. They seem likely to lose even more credibility as electricity bills rise through the need to cover damages and compensation costs that have already been projected at several trillions of yen. Moreover, nuclear reactors take many years to build even in the best of times, and now they are destined to take longer still. It will take time to improve safety measures and assuage the public's nuclear fears in the wake of the crisis. Power demand will not wait in the interim, however, raising concerns about Japan's ability to grow out of this crisis and the implications for its already huge 200-percent ratio of public debt to gross domestic product.

TEPCO is deploying all the thermal-fired capacity it has on hand at maximum operating rates. Being on a 50-hertz (Hz) standard, it is unable to draw on significant surplus power from the other regional monopolies west of it, which run on a 60-Hz standard. Only a gigawatt trickle of power can flow through the transformers. And as we have seen, Chubu Electric, the second-biggest monopoly, now has three reactors offline. It will barely be able to cover anticipated increases in power demand in its region during the peak hours of summer, let alone ship power to TEPCO. Not surprisingly, international fossil-fuel markets are already speculating about even higher prices for coal, natural gas and oil. Prices will almost certainly increase through this year, making TEPCO's power increasingly costly. Keep in mind that Japan's residential power prices are already among the highest in the industrialized world.

Many observers in Japan and abroad argue that natural gas is the solution, affording ready new capacity and a sturdy bridge to a low-carbon future. As of March 2010, TEPCO had 25.8 gigawatts of gas-fired generat-

ing capacity. One difficulty here is that large, gas-fired capacity takes a few years to build — less time than nuclear plants, to be sure, but still not fast enough to address imminent shortages. Moreover, big gas-fired capacity is, like its nuclear counterpart, the kind of centralized and unsustainable power generation that readily lends itself to reproducing the dominance of the large utilities and their division of the country into 10 separate fiefs. Conventional power generation thus reinforces the concentrated political and economic power that led to the crisis in the first place while hobbling hopes for promoting 21st-century utilities in Japan.

THE SUSTAINABLE OPTION

Long dismissed as a dwindling has-been, a "fly-over" between China and America, Japan has suddenly been catapulted into an energy future that all nations face. Still the world's third-richest country, with the third-largest electricity market, Japan possesses abundant human, financial and technical resources to devote to this power crisis. New power-generating capacity and transmission infrastructure of some type will be installed. Heading toward the slated redraft of the Basic Energy Policy in 2012, a crucial question for Japanese energy policy-makers is what kind of generating capacity that should be and how to integrate it into the national grid. The need to reconstruct a good part of the Tohoku region, including much of its electrical grid, opens the possibility of doing the power part of the Y20- to Y30-trillion job "smart," sustainable and distributed (broadly dispersed) rather than conventional and centralized. The monopolized utilities have been working behind the scenes over the past two years to impede domestic progress on installing smart grids and evolving smart-city urban forms. This obstructionism derives from generalized inertia as well as fear of losing their dominance to distributed power. But now Japan has the chance to leapfrog its own sunk costs and incumbent interests.

The balance of power in energy policy-making is fluid and hotly contested, but the sustainable-energy policy option is rapidly moving to the center of Japanese public debate. The discourse in the media, reconstruction committees and elsewhere increasingly recognizes that the centralized system focused on nuclear power is too costly and dangerous. Highly com-

plex, centralized systems per se are inherently and disastrously vulnerable to shocks, something as true of financial regimes and supply chains as it is of power generation and transmission. By contrast, Germany and a host of other countries and regions prioritize sustainable energy. They distribute increasing amounts of small-scale generating capacity among the myriad rooftops, yards, rivers and open fields of households, small businesses, farmers, local communities and so on. This strategy not only spreads the wealth and political influence created by a growing energy economy; it also bolsters the generating network because it is less vulnerable to the concentrated shock of an earthquake and tsunami. Natural disasters do not hit everywhere at once.

European successes are founded on policies that defray and drive down the short-run cost of making the transition to sustainable energy. Among the wind, solar, biomass, geothermal and other renewable technologies already in place, several are now less costly than nuclear or natural gas. On a levelized cost basis, several are even competitive with coal, the cheapest, dirtiest and most common means of producing electricity. The declining costs of renewables are in large measure thanks to the feed-in tariff (or FIT). The FIT at present supports 75 percent of global solar and 50 percent of global wind in no fewer than 85 national and subnational jurisdictions. The United Nations, the International Energy Agency, Deutsche Bank and a range of other organizations and agencies have determined the FIT to be the most effective and efficient means of promoting renewable power. In Germany, where renewables have tripled over the past decade and provide about 17 percent of electricity, the FIT costs German households an average of three Euros per month (roughly the price of a loaf of bread). The FIT essentially guarantees the renewable producer a long-term market and stable price for produced electricity. This temporary support to renewable energy production is designed to, and does, lead to price declines per kilowatt-hour for renewable energy sources.

Japan adopted a FIT on November 1, 2009. But this was a deliberately hobbled version that the nuclear village hastily drafted and got passed just after the 2009 election campaign. The nuclear village moved at light speed, relative to the generally languid pace of Japanese bureaucratic politics, to pre-empt the threat of a German-style comprehensive FIT applying to all

renewables. Yet even this hobbled policy support, a FIT that applies only to solar and with many restrictions, saw Japan's solar market take off in 2010 after being eclipsed by the German and Chinese markets. And the momentum has spread to other renewable power sources. Japan's farmers, local communities, construction firms and other interests are turning toward geothermal, wind, biogas and other power generation to enhance income, local energy security and their capacity to contribute in the fight against carbon emissions and climate change. Added into the bargain from sustainable energy choices are reduced dependence on unstable and increasingly costly imported energy resources and none of the risks of nuclear power.

Japan's FIT is slated to extend to geothermal, wind, small hydro and biogas from April of 2012, with a host of restrictions and other limitations that the nuclear village forced through over the objections of experts, local communities and other interests that sought a robust, comprehensive FIT. Ironically, the draft version received Cabinet assent on March 11, only hours before the earthquake. The continuing crisis is likely to afford an opportunity to revisit this draft. Diet debate on the bill that includes the expanded FIT is likely to start in June 2011.

Many observers in Japan, as well as overseas, have long derided renewables as costly, unreliable and impossible to scale up fast enough to satisfy growing global demand. But the empirical evidence suggests that incumbent energy interests are the ones whose prices are climbing and whose capacity is slow to expand. By contrast, the costs of green power are dropping rapidly while its generating capacity is diffusing faster than fossil-fuel-fired plants. Moreover, this information has animated Japanese public debate in the wake of Kan's press conference.

Softbank CEO Masayoshi Son, Japan's richest businessman and certainly one of its savviest investors, has become one of the most visible proponents of a shift away from nuclear power to renewables. From mid-April, he has given numerous talks and penned several articles on this subject. He announced a Y1 billion investment of his own personal funds in a renewable-energy foundation to bring together the globe's top 100 experts and craft policy input for Japan. He got the government's attention, meeting for just under three hours with Kan about energy policy on the evening of May 14. Concerning nuclear power, Son points out that he himself long believed it

cost only the Y5 or so per kilowatt hour that the nuclear village contends. But after examining contemporary generation costs, he learned the real cost is at least triple that. He adds that one then has to add the enormous burden of dealing with nuclear waste as well as with the damage and lost business stemming from the current crisis.

Kono Taro, 47, a rising star in the opposition Liberal Democratic Party, is a U.S.-educated and well-informed critic of vested energy interests who agrees with Son. Like Son, Kohno stresses the role of a comprehensive FIT and other policies to evolve beyond nuclear power and achieve 100 percent reliance on renewable energy by 2050. Kohno is joined on the political right by the *Sankei* newspaper, which has followed numerous positive articles on renewables with a very detailed assessment of the need for smart energy policy, the smart grid and expanded renewable energy in its May 15 edition.

The political center now features venerable NHK, the national broadcaster, running investigative programs on why Japan — ostensibly a powerhouse of green — is so far behind the Europeans and others in deploying its abundant renewable-energy resources and manufacturing capacity.

Nomura has assessed the Japanese smart grid's cost at a cumulative (by 2030) Y12 trillion. U.S. studies by the Electric Power Research Institute indicate that the benefits of the smart grid are likely to be four times its installation cost. And that figure does not include massive export market opportunities for first movers that use their domestic markets to achieve scale and other efficiencies as well as hone their technological edge. In this respect, it might seem bizarre that mid-May saw announcements from Japan's Hitachi and elsewhere that the company was involved in constructing a smart grid on Maui. The Hawaiian island is depicted in press releases as an isolated island heavily reliant on a single energy source and with a relatively high cost of power. These features apparently give Maui ample incentives to pursue renewables using the smart grid to manage the more erratic flow of demand and supply. But nearly the same description would seem apt for Japan as well.

As for scalability of the renewables connected by the grid, the March 17 release of "Clean Energy Trends 2011" indicates that the global solar market grew from $2.5 billion in 2000 to $71.2 billion in 2010 and that wind power went from $4 billion to $60.5 billion over the same period. To be sure, these

figures are still a small fraction of the markets for oil, coal and natural gas. But the numbers show that renewables are increasing rapidly and certainly can scale up. Indeed, total global production potential of solar alone is now an annual 28 gigawatts, or roughly 28 nuclear reactors. It is also notable that the rapid rates of growth revealed in the report were achieved without an especially supportive, crisis-driven policy. Wind and solar's remarkable rates of growth were also recorded prior to the onset of worsening instability in the Middle East/North Africa, Japan's current nuclear crisis and other shocks to the energy status quo and the assumptions that underlie it. Nor did renewables enjoy the truly massive financial flows and state support that boosted nuclear power and the conventional energy sectors. In Japan, for example, state fiscal support for nuclear between 1970 and 2007 totaled about Y9.7 trillion while all "new energy" such as solar, wind and biomass received only Y1.7 trillion.

The intersection between policy and finance is the crucial one. For example, in a cover story titled "Paying for the Green Revolution," the February 2010 edition of *Global Finance* pointed out that "hundreds of billions of investment dollars, if not trillions, from pension funds, private equity investors, sovereign wealth funds and hedge funds are waiting on the sidelines" while energy interest groups fight to shape public policy. *Global Finance* portrayed policies like the FIT as especially key to opening the floodgates of capital to renewable investment. This image of pent-up financial power waiting for a strong policy signal is particularly true of Japan. Banks have remained shy of lending, save to the state, even two decades after the 1980s bubble's collapse. Borrowers for new business also remain scant, keeping domestic consumption low and thus maintaining Japan's heavy reliance on exports to stoke growth. But green energy policy, at the core of a smart reconstruction, could fuel a large and sustainable boom in Japan's domestic economy.

There is indeed significant evidence that the global energy economy is at a very critical turning point, as financial flows are following smart energy policy. The September 2010 Renewable Global Status Report shows that the $30 billion invested in renewable-energy capacity and manufacturing plants in the world in 2004 had expanded to $150 billion by 2009. It also shows that 2009 was the second year running in which "more money was invested

in new renewable energy capacity than in new fossil fuel capacity." Germany and China were the investment leaders (at about $25 billion to $30 billion each), with the U.S. a distant third (at just over $15 billion) followed by Italy and Spain (roughly $4 billion to $5 billion each). Unfortunately, Japan does not even make the list.

The point here is to highlight the pace and scale of the green revolution that is already under way. Nicholas Stern, the author of the October 2006 "Stern Review on the Economics of Climate Change," now refers to these developments as an industrial revolution, one China is leading. China's incentives have become so robust that it has leapt to the top of Ernst & Young's quarterly Renewable Energy Attractiveness Index. China is considerably outpacing all competitors, including aggressive U.S. states such as California. Japan is at 15th place, just ahead of Poland and one point behind an Australia that possesses splendid renewable-energy potential but is politically dominated by coal interests.

Clearly, Japan has enormous potential and incentives to move up the ranks in this race. Until now, political inertia and the opposition of vested interests have held Japan back, but crisis creates opportunity. Now its policy-makers face a stark choice between continued devotion to nuclear power, with all the attendant costs and risks, and a more sustainable future. It does not seem that Japan can have both, for fiscal reasons and because competitiveness in renewable power and smart-grid/smart-city projects further undermine the logic of nuclear power. Renewable energy and related technologies are core parts of a rapidly growing business sector. Japan's own Nikkei BP Cleantech Institute estimates that this sector on a global basis could be worth Y3,100 trillion by 2030. Many analysts argue that for Japan to get a big share of this market, it needs to ramp up renewable power quickly. That goal implies smart energy policy as well as a strong dose of deregulation and competition for the monopolized utilities.

In short, Japan's energy politics and policy-making are now suddenly very fluid and increasingly moving in sustainable directions. It would seem the incumbent interests in the nuclear village can at best hope for no further downgrading of the role of nuclear power in the energy plan. But the prospect of real deregulation and a politically weakened public-sector capacity (political as well as fiscal) to cover heavily subsidized costs carries

ominous implications for the nuclear power option. Japan's still unfolding catastrophe has become the ultimate teachable moment, and one can only hope that the tragic opportunity of reconstructing the power sector is done equitably and sustainably. Whatever choices Japan makes, its example in this vital sphere will not only be a lesson for us all but will shape our own power costs and opportunities.

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WHY A NUKES-FREE FUTURE IS A FALSE DREAM

BY ROBERT DUJARRIC

It is too early to know what the exact consequences of the Fukushima No. 1 nuclear plant's breakdown will be. We can, however, say with some certainty that, even including future deaths caused by radiation, the fatalities caused by the accident will account for a very small proportion of the victims of the Great East Japan Earthquake, most of whom perished as a result of the tsunami that followed the tremor.

Nevertheless, it is possible, in fact probable, that the most significant global consequence of the March 11 disaster will be the damage it inflicted on the civilian nuclear industry. German Chancellor Angela Merkel's about-face on atomic energy is a good indicator of how some politicians and governments reacted to the Fukushima Daiichi partial meltdown. Even nations as committed to the industry as France and China may feel the effect of this increased hostility toward nuclear energy. Though it is far too early and probably mistaken to say that this will put an end to Japan's atomic program, it would be surprising if it did not slow it. In fact, nuclear energy in other countries, especially in the northern half of Europe and the United States, may suffer from the tsunami more than the Japanese nuclear industry given the greater strength of antinuclear feelings in parts of Europe and the fear of liability suits in the U.S. In Japan, however, the political economy of the country makes change — in any direction — far more difficult.

The historical and technological connection between nuclear weapons

and fission energy as well as the invisible and thus frightening nature of radioactive contamination make people particularly fearful of nuclear accidents. The coverage of workers risking high doses of radiation to repair the stricken plant was far more extensive than would have been the case had Fukushima been an oil refinery and the rescuers firefighters putting their lives on the line to extinguish a chemical fire. Radiation sickness and death elicit very different journalistic treatment than injuries and fatalities caused by falling debris, burns and other "conventional" casualties that are the daily occurrence of industrial society. The Chernobyl explosion seared a dark place in the world's collective memory, whereas the 15,000 to 20,000 fatalities and hundreds of thousands who got sick as a result of the Bhopal disaster are largely forgotten. In the two years prior to March 2011 (i.e., before the Fukushima partial meltdown), "Chernobyl" appears more than 3,000 times in a Lexis search of all English-language news, but the Bhopal tragedy seems to have warranted just a few hundred dispatches or articles. If Chernobyl had been in the middle of Western Europe or the U.S., one could ascribe the differences to the greater weight of events in the North Atlantic area in the world's psyche and western press. But Ukraine is very peripheral to the Western consciousness, and no Western Europeans or Americans resided near the plant. If anything, as India is part of the English-speaking world (or at least its elite and top publications are), it has a free press, and a major U.S. corporation (Union Carbide) was at fault, Bhopal should have, all other things being equal, generated more interest.

We also see this hypersensitivity to all things atomic in the history of the Second World War. The Hiroshima and Nagasaki bombings are universally known and serve as rallying cry for peace activists and disarmament advocates throughout the world. On the other hand, even among the educated public few are aware that conventional bombing and firebombing killed far more residents during the U.S. Army Air Force B-29 air attacks on Tokyo than when uranium- and plutonium-fueled nuclear explosives were dropped on Hiroshima and Nagasaki. There is a world-famous Peace Memorial in Hiroshima, but no such shrine exists for those incinerated by General Curtis Lemay's bombers in Tokyo.

Additionally, in the case of Fukushima, the inept response of TEPCO did nothing to reassure the public. The public came to the not-unreason-

able conclusion that a technologically complex and potentially lethal power plant was in the hands of people who should not have even been entrusted with running a vegetable stand. The government was clearly either unwilling or unable to step up in time to assume control and take the necessary emergency steps. The combination of incompetence, lies and unwillingness to seek immediate outside assistance was not only detrimental for TEPCO but did no good to the cause of nuclear power. More positive news about nuclear power, namely the absence of dangerous leakages or meltdowns at other reactors, despite the 9.0 magnitude of the March 11 quake, gained no notice.

The emotional reaction to the Fukushima Daiichi disaster has failed to take into account the risks and costs inherent in the alternatives to atomic electricity generation.

Opponents of nuclear power often suggest that the solution is consuming less energy. This is a worthy goal, but there are limits to what can be achieved without accepting a fall in the standard of living except if one accepts a return to the Stone Age. Moreover, there are still billions of human beings on the planet who live in poverty. If they are to enjoy a better life they will need to consume more energy to light and heat their homes, wash their clothes, keep their food cold and travel to school and work. They will — rightly — want to have access to goods that require manufactured energy and to energy-consuming services. Therefore, though they mean well, the more extreme antinuclear groups in the developed world want to deny a large percentage of humankind the benefits of a modern technologically advanced standard of living that they themselves enjoy. Their message to the world's poor is "Sorry, the boat is full, have a nice day, it was nice knowing you."

Another alternative to nuclear plants could be solar- or wind-based electricity production and other sources of energy such as biomass or hydroelectricity. Unfortunately there are severe technological and economic obstacles to be overcome to allow these techniques to make a much greater contribution to the world's energy needs. Additionally, some of them, such as biofuels, turn out to have ecological and other costs that make them far from perfect. Questions are often raised about the unintended ecological consequences of the dams that produce hydroelectricity. In several cases,

such as the dams Turkey has built upriver from Syria and Iraq, hydroelectricity can fuel international conflicts between upstream and downstream nations. Investing more in these options makes sense. Regulatory changes and effective tax incentives could help a lot. But we cannot expect renewables to "solve" the energy question in the foreseeable future. Moreover, if they come online, the priority should be to use them to decrease oil consumption.

New technologies, such as nuclear fusion or other revolutionary discoveries, could alter the landscape. Yet there is always a significant time lag between a working prototype and the dissemination of a new technology. Spending a lot more on research and development, providing the right incentives to explore revolutionary solutions, makes a lot of sense. In Japan's case, devoting more resources to energy alternatives and less to subsidizing farmers would make a lot of sense (as it would in the West).

Thus, though they seldom mention it, those who seek to abandon nuclear power are arguing in favor of greater reliance on fossil fuels. Their prescription is "let's burn more oil and let's drill everywhere." Unfortunately, there are costs associated with this option. One that is often forgotten is the geopolitical price. The inescapable fact is that the largest reserves are located in politically volatile regions, principally but not exclusively the Persian Gulf and North Africa. West Africa, where oil is also plentiful, is not particularly stable, and few can predict with certainty that Kazakhstan will remain the steady autocracy it has been since the breakup of the Soviet Union. With regard to natural gas, countries such as Russia and Qatar are not the ideal suppliers. In fact, of the major oil and gas exporters, only Norway and Canada (for gas) qualify as countries that offer stability, the rule of law and foreign-policy ambitions that are compatible with world peace.

Thus, as a consequence of the distribution of petroleum reserves, the United States and its allies have had to sacrifice the lives of their servicemen and women and spend trillions of dollars over the past decades to sustain a military establishment that could, in case of emergency, take control of the Persian Gulf oil fields. The self-destructive U.S. invasion of Iraq has understandably discredited American intervention in the region. But the fact remains that should a dreadful contingency — be it a global Shia-Sunni war, an Iran-Saudi conflict or an al-Qaeda uprising in Saudi Arabia — threaten

to shut off the Persian Gulf oil fields, even the most devoted pacifists in Japan would want the U.S. military — perhaps helped this time by China and partly funded by Japanese taxpayers — to take control of the region to prevent a Great Depression II.

Besides the potential issue of U.S. intervention, oil-fueled wars have already killed hundreds of thousands of individuals in the civil war in Algeria, the constant insurgencies in the Niger Delta and the Iran-Iraq war. Though it is now much weakened, we should not forget that al-Qaeda funded its spectacular strike in September 2011 not through bank robbery but through the much more lucrative — and legal — device known in America as the gas pump. Oil is exhibit No. 1 in the story of the natural-resource curse. It is not that without oil Algeria, Nigeria, Saudi Arabia, Iran and Iraq would have evolved into the Switzerlands and New Zealands of their respective regions. But without any doubt, the pathologies associated with oil have done much to breed violence in countless nations.

Last but not least, there is the enormous health and environmental toll of oil. Cars and oil-fired electricity plants produce toxic fumes and particulates that have caused far more cancers and lung ailments than nuclear power plants. The ecological costs of global warming are widely known, but few realize that ending nuclear power would contribute to worsening the situation. This may not be obvious to all environmentalists, who generally reside on higher ground or in countries rich enough to cope with climate change. But the residents of the Maldives and Bangladesh understand that the opponents of nuclear power are implicitly telling them that rising seas aren't that bad.

The other fossil-fuel alternative to nuclear energy is coal. Unlike oil, it is located in enormous quantities in large energy-consuming nations such as the U.S., China and India. Peaceful countries, such as Australia, offer a safe source of supply. Unfortunately, it also contributes to global warming, and burning it to generate electricity generates far more pollution than nuclear plants.

Nuclear power itself is not without its disadvantages. These include storage of radioactive waste, control of highly dangerous substances that can be used to build nuclear weapons and the potential for lethal accidents. Policies that encourage conservation and development of alternative sources of

energy are highly desirable. But overall, countries that decide to abandon nuclear energy in the wake of the Fukushima Daiichi accident may well be embarking on a road that will do more harm than good to their economies and the environment.

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BUILDING THE NEXT FUKUSHIMAS

BY GAVAN MCCORMACK

The nuclear era that began in Japan less than a decade after the destruction of Hiroshima and Nagasaki may well have been brought to its close by the events at Fukushima six and a half decades later. The Hirohito imperial broadcast of August 15, 1945, announcing the Japanese surrender and calling on the Japanese people to unite to "endure the unendurable" is now matched by the Akihito imperial television address of March 16, 2011, calling on people to unite in the face of catastrophe and help one another through the crisis. Two days after the Akihito address, the government announced that the Great East Japan Earthquake disaster was to be elevated from level 4 to level 5, on a par with Three Mile Island, and three weeks later, on April 12, it raised it again, to level 7, the maximum on the international scale for nuclear incidents, alongside Chernobyl.[1]

Does the first imperial address on television match the first on radio in signifying radical change? Those at the center of the Japanese state, on both occasions facing deep crises, seem to have deployed the emperor to similar ends: to soothe public fear and desperation, deflect anger from the pursuit of those responsible into a national sentiment of unity and confirm the emperor's own place as healer, restorer and axis for change.

The Akihito address used form and content that subconsciously linked the two occasions in listeners' minds. Through it, the Japanese state implicitly called on the people to appreciate that beyond the disaster unfolding in northeastern Japan, the country faces a shift in direction comparable to that of 1945. Then, Hirohito's role was to shift Japan from militarism and war to acceptance of defeat and drastic change; now, Akihito's address may be

construed as a concession that the nuclear path chosen by postwar Japan, like the militarist path of his father's generation, has ended in catastrophe.

Successive generations of Japan's bureaucratic, political, corporate and media elite have insisted that Japan pursue the nuclear power path at all costs. In retrospect, they drove the country forward, as the elite of the Kwantung Army drove it in the prewar era, toward disaster, ignoring, coopting or crushing all opposition.[2] Only now, facing the costs— human, environmental and economic—the long-postponed debate opens.

The problem is not just the cluster of reactors in and around Fukushima but the nuclear system and the mentality that underpins it; Fukushima is far from being exceptional. Seismologists have long said that the fault lines on which the Hamaoka cluster of reactors at Omaezaki in Shizuoka prefecture rest are unstable and at least as prone to disaster. The Hamaoka design contemplated a maximum earthquake of 8.5, which means it could no more be expected to cope with one of 5.6 times greater force (480 million tons of TNT) than was Fukushima. Seismologist Ishibashi Katsuhiko notes that the effect of such an event would be huge: "The U.S. military will also be affected — a disaster at Hamaoka will mean bases in Yokosuka, Yokota, Zama and Atsugi will all be of no use."[3] A Fukushima-type collapse would force the evacuation of 30 million people, signaling the collapse of Japan as we now know it.

Even though no existing reactor has been designed to withstand a 9.0-magnitude earthquake or its likely accompanying tsunami and therefore all *should* be closed, it would be unrealistic to demand that. However, to stabilize not just Fukushima but Japan itself, the disastrous and irresponsible decisions taken by governments over the past half century to pursue nuclear energy as a sacrosanct national project have to be reversed. The immediate priority must attach to close Fukushima and Hamaoka (and other extreme high-risk sites including Kashiwazaki-Kariwa in Niigata prefecture, the world's largest nuclear generation complex);[4] to secure, stabilize and remediate the Fukushima sites, resettling and compensating the refugee population and rebuilding shattered infrastructure; to cancel all planned and under-construction reactor works (including Hamaoka No. 6 and Kaminoseki in Yamaguchi prefecture); to suspend all existing and experimental projects for uranium enrichment, plutonium accumulation, use and fast

breeding; to stop the planned export of nuclear plants to countries such as Vietnam (personally promoted by Prime Minister Kan as late as October 2010); and to adjust public and private investment priorities to a completely different vision of energy production and consumption.

What is called for, in short, is the reversal of a half century of core national policies and the switch to a renewable energy system beyond carbon and uranium.[5] Such a strategic decision, turning the present disaster into the opportunity to confront the key challenge of contemporary civilization, amounts to a revolutionary agenda, one possible only under the pressure of a mobilized and determined national citizenry. At this crucial juncture, how Japan goes, the world is likely follow. The challenge is fundamentally political: Can Japan's civil society accomplish the sovereignty guaranteed it under the constitution and wrest control over the levers of state from the irresponsible bureaucratic and political forces that have driven it into the present crisis?

On such a trajectory, instead of a subordinate and secondary role in the current (now stalled) global "nuclear renaissance," and the continuing feeble presence on the world political and diplomatic stage as a U.S. "client state," Japan could become a world leader. It is the sort of challenge to which Japan's best and brightest might rise and around which its people might unite.

March 2011 is set to mark a caesura in Japanese history comparable to August 1945: the end of a particular model of state, economy and society, both marked by nuclear catastrophes that shook the world (even if the present one seems likely to be slightly muted and the meltdown kept to partial, the regional consequences may be broader, the number of people disastrously affected greater). Where the mushroom clouds over Hiroshima and Nagasaki signaled the end point of the path chosen by the young officers of the Kwantung Army in the 1930s, the chaos and apocalyptic apprehension of postquake and tsunami Fukushima in 2011 is the end point of the path chosen by senior state bureaucrats and their corporate and political collaborators in the 1950s and steadily, incrementally reinforced ever since. Their legacy is today's nuclear state Japan. 1945 was a purely human-caused disaster. 2011 differs in that it was occasioned by natural disaster, but human factors hugely exacerbated it.

Japan's "Hiroshima syndrome" of fear and loathing for all things nuclear

meant that cooperation with U.S. nuclear-war-fighting strategy had to be kept secret, in *mitsuyaku* or "secret treaties," especially in the 1960s and 1970s, that have become public only in the past two years. The nuclear energy commitment, also pressed by the U.S., had likewise to be concealed, never submitted to electoral scrutiny and continually subject to manipulation (extensive advertising campaigns), cover-up (especially of successive incidents) and deception (as to risk and safety levels). The extent of that too is now laid bare.

The way out of the current disaster remains unclear. The debate over Japan's energy and technology future will be long and hard, but what is now clear is that Japanese democracy has to rethink the frame within which this elite was able to overrun all opposition and push the country to its present brink. The crisis is not just one of radiation, failed energy supply, possible meltdown, the death of tens of thousands, health and environmental hazard but of governability, of democracy. Civic democracy has to find a way to seize control over the great irresponsible centers of fused state-capital monopoly and open a new path toward sustainability and responsibility. A new mode of energy generation and of socioeconomic organization has to be sought. Ultimately it has to be a new vision for a sustainable society.

It is of course a paradox that nuclear victim Japan should have become what it is now: one of the world's most nuclear-committed, if not nuclear-obsessed countries. Protected and privileged within the American embrace, it has over this half century became a nuclear-cycle country and a plutonium superpower, the sole non-nuclear state committed to possessing both enrichment and reprocessing facilities and the fast-breeder reactor project. Its leaders chose to see the most dangerous substance known to humanity, plutonium, as the magical solution to the country's energy security. While international attention focused on the North Korean nuclear threat, Japan escaped serious international scrutiny as it pursued its nuclear destiny. One bizarre consequence is the emergence of Japan as a greater nuclear threat to the region than North Korea.

Just over a decade from Hiroshima and Nagasaki, at the time of Eisenhower's "atoms for peace" speech, Japan's Atomic Energy Commission drew up its first plans. The 1967 Long-Term Nuclear Program already incorporated the fuel cycle and fast-breeder program. By 2006, the Ministry of Eco-

nomics, Trade, and Industry's "New National Energy Policy" set the objective of turning Japan into a "nuclear state" (*genshiryoku rikkoku*). Nuclear power generation grew steadily as a proportion of the national grid, from 3 percent of total power in 1973 at the time of the first oil crisis to 26 percent by 2008 and around 29 percent today. The country's basic energy policy calls for the ratio of nuclear, hydro and other renewables (nuclear the overwhelming one) to be nearly 50 percent by 2030. Under the Basic Energy Plan of 2010, nine new reactors were to be built by 2020 (none having been built since the 1970s in the wake of Three Mile Island and Chernobyl) and 14 by 2030, while operating levels of existing reactors were to be raised from 60 percent as of 2008 to 85 percent by 2020 and then 90 percent by 2030.[6]

The dream of eternal, almost limitless energy has inspired the imagination of generations of Japanese national bureaucrats. In the words of a panel at the Aquatom nuclear theme park-science museum in Tsuruga, close to the Monju plutonium fast-breeder reactor, "Japan is a poor country in natural resources ... therefore Monju, a plutonium-burning reactor, is necessary because plutonium can be used for thousands of years."

Trillions of yen were channeled into nuclear research and development programs and additional vast sums appropriated to construct and run major nuclear complexes. If the Federation of Electric Power Cos. estimate is even roughly correct, that the Rokkasho complex in northern Honshu will cost Y19 trillion over the projected 40-year term of its use, that would make it Japan's, if not the world's, most expensive civil facility in history.

Japan is alone among non-nuclear-weapon states in its pursuit of the full nuclear cycle, building plants to reprocess its reactor wastes, burning plutonium as part of its fuel mix (as at the Fukushima Daiichi's No. 3 plant since late 2010), storing large volumes of "low-level" wastes, and desperately struggling to chart a way forward to fast-breeder technology, something so prodigiously difficult and expensive that the rest of the world has set it aside as a pipe dream. At all stages — fuel preparation, reactor construction and operation, waste extraction, reprocessing, storage — its nuclear system was problematic long before the tsunami crashed into its Fukushima plant on March 11, 2011.

There are 54 reactors in operation or were till March. At Fukushima the reactor cores may have survived intact, but the management practice of

leaving highly toxic and long-lived wastes in ponds beside the actual reactor has proven a terrible mistake. According to atomic specialist Robert Alvarez, such pools contain radioactivity between five and 10 times greater than that of one reactor core, with one pond holding "more cesium 137 than was deposited by all nuclear weapons tests in the Northern Hemisphere combined," and "a major release of cesium 137 from a pool fire could render an area uninhabitable greater than that created by the Chernobyl accident."[7] Whether because of sloshing under the impact of the quake or leakage from structural collapse, the rods at several of the Fukushima plants were partially exposed for unknown periods, fires did burn with unknown consequences and the resumption of cooling using seawater by fire hose or helicopter bombing and ultimately by the reconnection of pumps has proven immensely difficult.[8]

Once the immediate crisis passes, these plants will have to be decontaminated and dismantled, an expensive, difficult and time-consuming task that will take decades, while the electricity they once provided must be somehow substituted. Whether they can or will simply be cased in concrete like Chernobyl remains to be seen, but they will surely become a monument to the disastrous mistakes of the postwar Japanese nuclear plan.

Of the major complexes other than Fukushima, the most notorious are those at Kashiwazaki in Niigata and Hamaoka in Shizuoka. Kashiwazaki, with seven reactors generating 8,000 megawatts, is the world's largest nuclear generation plant. The 6.8-magnitude quake it experienced on July 16, 2007, was more than twice as strong as the design had allowed for, and the site proved to be on a previously undetected fault line. Catastrophic breakdown did not occur, but multiple malfunctioning did, including burst pipes, fire and radioactive leaks into sea and air. The Hamaoka complex, 190 kilometers southwest of Tokyo, has five reactors, which, like those at Kashiwazaki, sit on fault lines where the Eurasian, Pacific, Philippine and North American plates grind against one another and where experts predict a strong chance of a powerful quake sometime in the near future. Company officials say the plant is designed to withstand an 8.5-magnitude earthquake, as that was believed to have been the most powerful ever known in the area. After Fukushima's 9.0, however, the preconditions on which Hamaoka was based have collapsed. A Fukushima-level event here could force the evacuation of

up to 30 million people.

Perhaps most controversial of the site plans is that for two reactors to be built at Kaminoseki, population 3,700, an exquisitely beautiful national park site at the southern end of the Inland Sea about 80 kilometers from Hiroshima, one to commence operation in 2018 and the other in 2022. After nearly 30 years of attempts to start these works, blocked by fierce local resistance, especially on the part of the fishing community of Iwaishima, the island that faces the reactor site across about four kilometers of sea, preliminary forest clearing and sea refilling works began late in 2010. With fierce confrontation continuing between fishing boats, canoes and kayaks on the part of the protesters and the power company's ships, however, it is hard to imagine that after March 2011 the government will find the will to move in and crush the protesters. Indeed, the governor of the prefecture has demanded that work be halted (and in the wake of March 11 it has indeed halted, at least temporarily).

Nuclear reactors generate large quantities of irradiated waste, which has to be either stored or reprocessed. Since 1992, high-level wastes have been reprocessed at plants at Sellafield in England and la Hague in Normandy in France, each shipment equivalent to about 17 atomic bombs' worth of plutonium. The former director-general of the International Atomic Energy Agency, Mohammad Elbaradei, saw reprocessing as so dangerous that it should be done only under the strictest international supervision and appealed to Japan for a five-year freeze on all enrichment and reprocessing works. Japan dismissed his appeal, arguing that such a moratorium was applicable only to "new" projects, while Japan's had been under way for decades.

Rokkasho, north of Fukushima in Aomori prefecture, is the world's most intensive concentration of civilian nuclear energy facilities, including fuel processing, waste reprocessing, enrichment and waste storage. Its reprocessing unit is designed to convert 800 tons of spent fuel per annum, yielding each year about eight more tons (1,000 warheads' worth) of pure, weapons-usable plutonium. After many delays, reprocessing was conducted on a trial basis in 2006, but the facility has yet to commence full commercial operation. A second reprocessing plant at Tokaimura has been shut since 1999, when an accident at its experimental fast breeder showered hundreds

with radiation and killed two workers. Consequently reactor wastes accumulate, much of them stored, like those at Fukushima, around the reactors from which they have been extracted.

Rokkasho Nuclear Fuel Reprocessing Plant, 2008

Even if Rokkasho's reprocessing plant were to commence operation sometime soon, it would make little more than a small dent in Japan's accumulated and accumulating wastes, estimated at approximately 12,600 tons as of 2006. So Japan's wastes, including separated plutonium (Japan possesses roughly one-fifth of the world's civil plutonium stocks), accumulate steadily and will continue to do so even if or when the reprocessing proceeds according to plan.

Under current (to March 2011) plans, fluids containing low levels of radiation were to be piped several kilometers out into the Pacific Ocean for discharge, the standards for effluent control having been relaxed so that Rokkasho could discharge the equivalent of the nuclear wastes of 1,300 power stations, sending tritium into the sea at 7.2 times the levels of the recently closed Sellafield plant in northern England or 2,800 times the level permitted for conventional reactors. Wastes from the infamous Sellafield plant are blamed for the devastation over decades of fish stocks across much of the Irish Sea and leukemia levels in children 42 times the national average as far away as Carnarvon in Wales.

Other low-level wastes are held in 200-liter drums, both at nationwide reactor sites and at the Rokkasho repository. Rokkasho's projected eventual capacity is for 3 million drums in 40 vast repositories, each containing 10,000 drums, destined eventually to be covered in soil, with something like a mountain built over them. After that, they must be closely guarded for at least 300 years. These repositories spread like giant poisonous mushrooms across the once beautiful backwater of rural Aomori prefecture.

High-level wastes, vitrified and put in canisters, are returned to Rokkasho, where they are to be stored initially for 30 to 50 years while their surface temperature slowly declines from around 500 degrees centigrade to 200 degrees centigrade, at which point the plan is to bury them too, in deeper (300 meter) caverns, where their radiation will further dissipate over millennia.

The burning of mixed plutonium-uranium oxide fuel, as at Fukushima's No. 3 plant, constitutes another way to divert plutonium from "waste" into active use as part of the "eternal" energy cycle. Fast-breeder reactors are another part of the solution to plutonium accumulation. They "breed" (i.e., produce more than they start with) very pure, super-grade plutonium. But the risk and cost associated with this unproven technology is so great that Japan is among the few nations that now pursues it, at prodigious expense and with very limited success. The Monju prototype fast-breeder reactor (at Tsuruga, in Fukui prefecture on the Sea of Japan) had to be shut down in 1995 after a sodium leak and fire followed by evidence of negligence and cover-up. After 10 years, the Supreme Court ruled in 2005 that it could proceed, and a contract was awarded to Mitsubishi, but technical difficulties mean that it has yet to do so. Under current plans, the fast breeder would be commercialized by 2050, 70 years behind its original schedule, with Monju being replaced by an additional plant, at a cost of "about Y1 trillion" around 2030.

For the country whose scientific and engineering skills are the envy of the world to have been guilty of the disastrous miscalculations and malpractices that have marked the past half century — including data falsification and fabrication, the duping of safety inspectors, the belittling of risk and the failure to report criticality incidents and emergency shutdowns — and then to have been reduced to desperate attempts with fire hoses and buckets to prevent a catastrophic meltdown in 2011 raises large questions not just for Japan but for humanity. Could the rest of the world, for which the U.S. government holds out the prospect of nuclear renaissance, do better?

The "nuclear state Japan" plans have plainly been shaken by the events of March 2011. It is too much to expect that they will be dropped, but the struggle between Japan's nuclear bureaucracy, pursuing the chimera of limitless clean energy, global leadership, a solution to global warming, the maintenance of nuclear weapon defenses (America's "extended deterrent") on the one hand and Japan's civil society, pursuing its agenda of social, ecological and economic sustainability, democratic decision-making, abolition of nuclear weapons, phasing out of nuclear power projects, and reliance on renewable energy, zero emission, material recycling and non-nuclear technologies enters a new phase after March 2011.

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Endnotes

[1]"La maison Japon se fissure — Le Japon nucléaire ou l'hubris puni," *Le Monde Diplomatique*, Online, April 2011.

[2] Meaning it was responsible for a major release of at least tens of thousands of terabecquels of radioactivity that was likely to cause "acute health effects" over a wide area.

[3] Ishibashi Katsuhiko is one Japanese critic who has consistently made this criticism. See, most recently, his essay, "Masa ni 'genpatsu shinsai' da," Sekai, May 2011, pp. 126-133.

[4] Jun Hongo, "World right to slam nuke program mismanagement: expert," *Japan Times*, 14 April 2011. 5 Shut down for nearly two years following damage in the Chuetsu earthquake of July 2007.

[5] For a Japanese newspaper editorial in similar vein: "Shinsaigo 'tei-ene' shakai Nihon moderu wa kano da," Mainichi shimbun, 16 April 2011.

[6] The DPJ government announced on 29 March 2011 that the existing "Energy Basic Plan" would now have to be fundamentally reviewed, and that green sources of energy, including solar, would be part of the review. ("14 ki no genpatsu zosetsu, minaoshi, taiyoko nado jushi e," Yomiuri shimbun, 29 March 2011.) The debate, of course, is just beginning.

[7] Robert Alvarez, "Meltdowns grow more likely at the Fukushima reactors," Institute for Policy Studies, 13 March 2011.

[8] For a catalogue of TEPCO's and the Japanese government's technical and other errors in handling the Fukushima disaster and earlier nuclear accidents, see Vaclav Smil, "Japan's Crisis: Context and Outlook," *The American*, April 16, 2011.

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