

# Review of Kate Brown, *Manual for Survival*

Paul Josephson

In the thirty years since the Chernobyl disaster we have learned a great deal about the causes of the accident, the human side of the story of those who worked at the station, the operators and their families in the now-abandoned nearby town of Pripyat, the hundreds of thousands of “liquidators,” and the millions of individuals affected by fallout, including some 300,000 who were evacuated from various exclusion zones and heavily affected rural areas, mostly to the north and east in (Soviet) Belarus, Ukraine, and small parts of Russia. What are the long term consequences of radioactive fallout to land and living things? How many people have and will die from exposure to radioactivity? In *Manual for Survival*, Kate Brown documents the efforts of scientists and doctors in Belarus and Ukraine to understand the short- and long-term impact of radiation exposure on Soviet and post-Soviet citizens, and the challenges even to simple data collection. Her conclusions stand in stark contrast to those of the International Atomic Energy Agency (IAEA), the World Health Organization (WHO), and the United Nations (UN) Scientific Committee on the Effects of Atomic Radiation that estimated perhaps 5,000 total deaths. The numbers will be much higher, perhaps on the order of 10,000 or 50,000 excess cancers and premature deaths. But we shall never know with certainty owing to a variety of factors—including the challenges of conducting research in the former Soviet Union, the obfuscation of data in some quarters who appear to seek to minimize the impact, and scientific uncertainty itself.

And yet, critical data can be found. *Manual for Survival* provides a rich and fast-paced investigation based on extensive reading of local and regional archival materials that focuses on the challenges in understanding the full impact of exposure to ionizing radiation on the affected populations. Brown argues ultimately that Soviet and international organizations connected with the various aspects of evaluating the radiological dimension of the Chernobyl disaster have continued to discount the health costs of low-level radiation and ignored clear evidence, for example, of a significant increase in the number of thyroid cancers in children.

*Manual* documents many of the heroes of the Chernobyl disaster: medical people who worked to protect and defend affected populations and continued to gather information and carry out studies even when discouraged from doing this work by the KGB—an organization ostensibly interested in national security and wellbeing, but which on several occasions seems to have been responsible for absconding with research folders, floppies, and computer hard drives with valuable data that documented the human costs of the disaster. Brown documents how people evacuated from places of danger into places of greater danger, unknowingly to all, and were then forced to fend for themselves. Even the centralized Soviet system could not figure out how to bring safe, untainted food stuffs into affected areas, so people continued to eat berries, mushrooms, and farm animals that were grazing and growing in radioactivity.

*Slavic Review* 79, no. 2 (Summer 2020)

© The Author(s) 2020. Published by Cambridge University Press on behalf of the Association for Slavic, East European, and Eurasian Studies

doi: 10.1017/slr.2020.82

Many of the non-heroes of this story are Soviet bureaucrats (those in the politburo barely focused on the contaminated regions, and then hoped to repopulate the evacuated areas to get them up, running and productive again), UN officials, and members of international partnerships and organizations involved in Chernobyl research and remediation who were more interested, it seems, in seeing that the nuclear energy went on. US Department of Energy officials, too, were less than honest in evaluating and sharing data about the risks of exposure; at that time the US government faced lawsuits over compensation to millions of Americans who had been exposed to nuclear testing or worked in bomb material fabrication facilities. Officials worried that publicity of high-end estimates of deaths and illnesses from Chernobyl might both hurt the future development of nuclear power and reflect poorly on the efforts of the Energy Department to defend itself. They were thus comfortable with low-end figures.

Of major importance is Brown's challenge to the international radiological studies community over the weaknesses of their data collection and analysis. Specialists continue to argue that low dose exposures are not a significant risk. Today scientists repeat that we know little about the effects of low doses of radiation on human health. That claim is partly true because of the suppression of the record of catastrophic damage in the Chernobyl territories. But Brown has unearthed documents to help us challenge it based on the evaluation of lives and bodies crushed by radiation.

Finally, in 1989, the state began to publish some information to help individuals cope with the ongoing disaster, since the government could or would not. It began to issue maps that showed contaminated regions. This was a time of the rise of citizens' science to understand the full ramifications of the disaster, and also of the rise of environmental and independence movements in several republics. Brown does not focus on the independence movements, but provides detail on the connections between these movements and the disaster in Ukraine. Unfortunately, just when researchers were able to pursue their research openly, the Soviet Union collapsed and Soviet science with it. Residents were left to take on radioactivity, political disorder, and economic crisis on their own. There were other problems. Data collection has been inconsistent. Families that moved away were not tracked. Children who had been resettled got lost in the system and fell off the registries. Blood drawn for exams did not make it to the lab in time because of poor roads, bad weather, or a shortage of needles and vehicles. Many communities that were assumed to be clean were not and were not monitored. And the children were getting sicker and sicker.

What do we know? Belarusian researchers discovered a significant increase in cases of leukemia among children in the three years after the accident. American epidemiologists determined that prolonged exposures even at very low doses increased the risk of leukemia. Children exposed to Chernobyl radiation, especially in utero, had lower IQ scores because of damage to neurological systems; a statistically-significant increase in birth defects of the nervous system; a doubling in the number of congenital malformations in Belarus between 1985 and 2004; and so on. Between 1985 and 1988, regional Ukrainian public health officials noticed in the most contaminated regions of the Kyiv Province an increase in thyroid and heart disease, endocrine and

GI tract disorders, anemia and other maladies of the blood-forming system. Doctors noticed a rise of auto-immune disorders. The number of pediatric infections—tonsillitis, chronic bronchitis, and pneumonia—climbed. In particular, the data reveal increases in cancers, and the illnesses among children were lymphomas, leukemia, cancers of the thyroid and GI tract.

Brown discusses the use of foreign experts to assess and whitewash the picture. Such experts argued that health problems were due to “psychological factors and stress,” and they derided affected villagers as frightened and ignorant. The UN Scientific Committee for the Effects of Atomic Radiation (UNSCEAR), the IAEA, and other groups and organizations, charged with providing a blueprint for how UN agencies funded future Chernobyl relief programs, were not fully disinterested in providing a roadmap to understand the impact on people. The IAEA and UN agencies constantly went with lower numbers, and refused to associate disease with contamination from Chernobyl radiation. Only in 1996 did WHO, UNSCEAR, and IAEA concede that the still skyrocketing increases in thyroid cancer in children were due to Chernobyl exposures. The denials meant that programs aimed at treatment and screening children were slow to start, and so it is likely that aggressive cancers were caught too late. The IAEA refusal to recognize the epidemic of thyroid cancers also crashed international aid.

Another ongoing dispute indicates uncertainty regarding the Chernobyl zone. Some people who argue that plants and animals in the Chernobyl Zone are thriving are wrong, but they are accurate in asserting that nature can help correct man-made disasters. Others, for example Michael Mousseau and Anders Pape Møller, have shown significant impacts on spiders, bees, and fruit flies. Fewer pollinating fruit trees means fewer fruit-eating birds. No matter the outcome of this disagreement, Brown rightly points out that this does not mean humans can step away and let “nature” do its work. Contaminated spaces require curation.

Of course, any study of the impact of the Chernobyl accident—given its range, dangers, meteorological conditions, and scientific state of the art—will have to deal with significant uncertainties and disputes among experts about the true extent and risks at the time and to this day. In this reality, critics of Brown’s work have published critical reviews of it. Jim T. Smith, who is cited in Brown’s book, writes that *Manual* “ignores the thousands of scientific studies on Chernobyl which are available in the international scientific literature. In doing so, it presents a biased and misleading account of the health and environmental effects of the accident. I believe that this book only perpetuates the many myths about the accident effects and has very little basis in sound science.”<sup>1</sup> Granted, Brown misses a large number of these studies, but the real question is on what data are they based and how to interpret the results, and the fact that they ignore many Soviet studies. Another recent study suggested that it would have been better (more “cost-effective”) not to evacuate people from the zone because there was insufficient public health benefit (based on

1. Jim T. Smith, Review of *Manual for Survival* by Kate Brown, *Journal of Radiological Protection* 40, no 1 (March 2020), available online at <https://iopscience.iop.org/article/10.1088/1361-6498/ab17f2>, (accessed March 23, 2020).

calculation of the average number of days of life expectancy lost), to justify the relocation of several hundred thousand individuals from lands contaminated by the Chernobyl disaster, and that it was economically justified to move only 26 to 62% of the original 116,000 evacuees.<sup>2</sup> Would these authors suggest that, if they were in an evacuation zone for a nuclear disaster in their countries, they would stay put for a few months to undertake a calm evaluation, then, based on a calculation of average days of life expectancy they might lose, merely stay in place?

Brown's book contributes to disaster history. While Brown herself does not often say so directly, several of the lessons she offers go beyond nuclear history to other histories of technogenic and other disasters. First, in virtually all disasters, the authorities will delay in ordering evacuations because they underestimate the dangers, listen to the representatives of industry responsible for the mess in the first place, worry about causing panic, and think about the costs of relocation. Second, the evacuees and others effected immediately and for the long term will nearly always be the poorest members of society, and the majority of them will be women and children. They will have a hard time getting out of harm's way in any event. Disasters are always stories of politics, about how to frame causes, effects, long term impacts, determining who will pay for remediation, if anyone, and about how to pay less. Every time citizens encounter a natural disaster in US, poor folk bear the brunt, whether it is Hurricane Katrina in New Orleans or Hurricane Irma, where President Trump disputed loss of life, sought to keep funding low, and tossed paper towels to a crowd of people of color. As Brown notes, modern disasters require a modern state to clean them up. The Soviet state, however, failed on all fronts.

Remember always that the Chernobyl-type RMBK reactors ran poorly with lots of leaks and accidents, and they are unstable at low power. They should never have been built. Fortunately, future RBMK projects were stopped, although those at Kursk, Smolensk, and Sosnovy Bor (Leningrad) continue to operate to the present.

The publication—in July 2019—of three studies documenting the extensive and essentially permanent public health dangers to people of the Marshall Islands, where the US set off scores of nuclear bombs in the late 1940s and 1950s confirms again that there is no safe dose and that cleanup is next to impossible.<sup>3</sup> Yes, chest x-rays have risk; yes, flying round trip internationally exposes you to excess radiation; yes, there is background radiation. But none of the people who say it is not risky—or that the risk is tolerable—live in those areas or want to.

2. Tatiana Kasperski, Olga Kuchinskaya, Paul Josephson, "Response to Waddington et al. on 'J-value Assessment of Relocation Measures following the Nuclear Power Plant Accidents at Chernobyl and Fukushima Daiichi,'" *Process Safety and Environmental Protection*, Volume 125 (May 2019): 331–33, available online at <https://tinyurl.com/uq83goj>, (accessed March 23, 2020).

3. Carlisle E. W. Topping, Maveric K. I. L. Abella, Michael E. Berkowitz, Monica Rouco Molina, Ivana Nikolić-Hughes, Emlyn W. Hughes, and Malvin A. Ruderman, "In Situ Measurement of Cesium-137 Contamination in Fruits from the Northern Marshall Islands," *Proceedings of the National Academy of Sciences* 116, no. 31 (July 30, 2019): 15,414–419, available online at <https://www.pnas.org/content/pnas/116/31/15414.full.pdf> (accessed March 23, 2020).