

and similar work remains to be done for many other fields, including religion.

TERRY MARTIN

Loren Graham; Irina Dezhina. *Science in the New Russia: Crisis, Aid, Reform.* xiii + 193 pp., tables, index. Bloomington/Indianapolis: Indiana University Press, 2008. \$22.95 (cloth).

“What happens to science when the nation supporting it disappears?” ask the authors of *Science in the New Russia*. In fact, the Russian and other constituent nations of the USSR did not disappear, but continued as separate states with developed infrastructures and scientific cadres. What did disappear in all of them is the high level of support for science, a signature characteristic of the Soviet-style polity. It is often assumed that the desire to imitate modern industrial capitalism demanded corrections to earlier communist distortions. Not so, when it comes to science. In Russia, state expenditures on R&D dropped to approximately 0.5 percent of GDP during the 1990s, rebounding to only slightly over 1 percent after 2000. Demand that the government follow the example of Western countries, where science is budgeted at about 2.5 percent of GDP, comes from the communist opposition, not the capitalist reformers. In short, science has suffered not merely from the inevitable consequences of political breakup and economic crisis but also, in no small measure, from choices made by postcommunist political elites.

Combined with the dramatic drop in GDP itself, these decisions created a very unwelcoming environment for science. But, as E. P. Thompson would have reminded us, the bare statistics about financial deprivation tell only part of the story. “Imponderables,” including comparisons with neighbors, cultural values, social hierarchies, and many other factors, play no less a role in how living standards are experienced. During the Soviet period, many scientists felt less well off individually than their colleagues in the distant West but enjoyed a higher level of prestige and respect within their own society. The disappearance of that esteem may have been even more disheartening for scientists than miserable economic indicators. Frequently ridiculed during the 1990s (“If you are so clever, why are you so poor?” as the popular saying went), dedicated scientists felt that their life’s work was rejected by society, which found its new cultural heroes among gangsters, bankers, and pop stars.

Russian science managed to survive, the book concludes; but according to the numbers pro-

vided the loss in scientific personnel exceeded 50 percent. The damage to actual productivity and quality of research may have been even more serious, though it is harder to estimate. Some researchers persevered out of sheer determination and attachment to older values. Some managed to support themselves through international collaboration and periodic work abroad. Some moved to permanent academic positions in other countries. Many more, especially the younger ones, left the field for other occupations. A few important achievements (perhaps not so surprisingly, in the field of mathematics) provide illustrations. The 1998 Fields Medalist, Maxim Kontsevich, has worked and lived in France since 1992. After a couple of years abroad, Grigory Perelman returned to Russia in 1995 and in 2002 found the proof of the Poincaré conjecture. He was awarded the 2006 Fields Medal but refused to accept it and lives modestly in St. Petersburg.

Loren Graham and Irina Dezhina discuss the Perelman case briefly, but on the whole *Science in the New Russia* does not explore the situation as it is experienced at the level of practicing scientists. The picture is closer to the one seen from the vantage point of ministerial offices and funding agencies, presenting overall, sometimes extremely telling, statistics, descriptions of policies and procedures for distributing support, and evaluations via anonymous surveys of grant recipients. The book describes attempts to reform the inherited structure of science, in particular by establishing granting agencies and foundations. That the writing of grant applications and peer reviews actually improved scientific productivity and performance is assumed rather than demonstrated. Grigory Perelman, the authors admit, did not and most likely would not have received grants within the new system. Instead, he relied on the type of institutional funding remnant from the Soviet model.

Another large section of the book describes the activities of international funding agencies for post-Soviet science. Some, I believe, were extremely well intentioned, such as the foundation created by George Soros. It provided much-needed short-term emergency aid to struggling scientists during the first, most difficult, transitional years but was less effective when it came to promoting scientific initiatives with potential for longer-term success. Another initiative that sought to fund Soviet scientists with military know-how, established on the paranoid premise that they were ready to work for “rogue” nations, *de facto* made their emigration to the United States and Israel easier. Overall, I think, international funding, significant as it was, did

not and could not adequately compensate for the disastrous decrease in internal support.

The real drama of events is not quite fully revealed in a study of bureaucratic efforts, reforms, and agencies. A very different kind of story would emerge from other sources—the actual survivors, defectors, émigrés, and hermits of post-Soviet science. Shocks of such magnitude rarely happen in the world of science, and the effects have been felt internationally. A sociological field investigation of former Soviet scientists in their home countries as well as in diaspora would reveal much about the culture of science in general, but such research still remains to be done.

ALEXEI KOJEVNIKOV

Jacob Darwin Hamblin. *Poison in the Well: Radioactive Waste in the Oceans at the Dawn of the Nuclear Age.* x + 311 pp., bibl., index. New Brunswick, N.J./London: Rutgers University Press, 2008. \$49.95 (cloth).

Poison in the Well reveals an important, overlooked strand in the history of post–World War II nuclear science, the evolving understanding of the practice of dumping radioactive wastes in the ocean. It is a topic that has for too long, in our historical renderings of this cornerstone of twentieth-century technoscience, been relegated to single sentences or footnotes. Jacob Hamblin's new book effectively makes the case that this marginalization owes more to historians' seduction into the viewpoints of physicists and industry advocates than nuclear technology's actual history. By a simple shift in frame, he demonstrates just how durable, and consistently debatable, this industry's waste problem has been. From its very start, those who converted nuclear know-how into nuclear plants sought out that most ultimate of sinks, the sea. Though this book takes the story into the 1970s, when an international outcry arose, the drama of the book's title is a bit deceptive. Deliberately seeking to avoid an "environmental screed," Hamblin hands us a highly tempered tale. We find, in place of "villainy," well-intentioned people doing their jobs and pursuing self-interest—and not just industry boosters but professional scientists on both sides of the debate. Focusing especially on health physicists and oceanographers in the main nations that went nuclear, the author crafts a finely researched narrative of how not just national politics of science but international science politics shaped these debates, which thereby became more than the sum of their national parts. Methodologically speak-

ing, *Poison in the Well* offers a convincing and exemplary case for how much our understanding of this kind of science gains from a transnational perspective.

Hamblin starts the narrative right after World War II, as producers of nuclear weapons and power first began to confront the question of what to do with the resulting wastes. We are introduced to the different configurations of decision making and expertise in five nations: the United States, Great Britain, France, Federal Germany, and the Soviet Union. In these early moments, health physicists, as yet untroubled by the interventions of oceanographers, urged decisions based on the threshold idea—what dose of radioactivity humans could tolerate without becoming sick. If soon shown to be illusory, at least in the ways it was applied early on, the threshold idea made regulation, and the industry itself, seem manageable; it also seemed to confirm the diluting power of the ocean as a waste repository. The British, in particular, eager to move ahead with nuclear production but with fewer remote locations available on land than, among others, the Americans, leaned heavily on the oceanic option.

Objections to the practice began to mount with the 1954 contamination of Japanese fishermen trawling in the vicinity of an American nuclear test. The Soviet Union's spokespersons offered the loudest objections earliest, coining the phrase that serves as this book's title, even as their industry covertly dumped away. The Russian accusers were easy to dismiss as propagandists, yet an "unwitting alliance" soon arose between them and the oceanographers of most of the other examined nations, spearheading a scientific opposition that soon gained influential access to policy debates. Their earliest success came in France, where their studies and other interventions led to a ban on the practice of ocean dumping. They gained ground elsewhere as well, notably in the United States. Their rivalry with the health physicists waxed unevenly, with Britain over the 1960s remaining a notable exception and several European nations teaming with the British to make ocean dumping a joint and international enterprise. By the late 1960s, the pathway toward a 1972 treaty targeting the practice was secured by the rising influence of scientists and politicians associated with the American environmental movement. This London Convention on Ocean Dumping followed up on the first international conference on the environment that same year in Stockholm. Hamblin portrays the convention as a culminating victory for those who questioned dumping but also as fundamentally hollow, given how exist-