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Tracking Down a Russian Nuclear Accident

By JERRY E. BISHOP

In the late 1960s there began appearing in Russian scientific journals occasional reports of experiments involving the "artificial contamination" of ponds, fields and forests with radioactive isotopes. The reports described the ecological effects of the radiation on a wide variety of plants and animals, from bacteria in the soil up to and including trees, deer and migratory birds.

If the reports were noticed by Western scientists at all, they apparently attracted

The Bookshelf

"Nuclear Disaster in the Urals"

By Zhores A. Medvedev. W. W. Norton & Co. 208 pages. \$12.95.

little interest. One reason might have been that the reports seemed of questionable scientific value; the Soviet scientists were unusually vague about the methods they used in conducting the experiments and about the conditions under which the experiments were carried out. Without such details, it is impossible to evaluate the significance of the results of the experiments.

But to an exiled Russian biochemist now living in London, these seemingly innocuous reports confirm that in 1957 or 1958 an unprecedented nuclear disaster occurred at a Soviet atomic reactor complex in the southern Urals. Huge amounts of radioactive debris were accidentally spewed out over hundreds of square miles, causing unknown hundreds of deaths from radiation sickness and rendering a vast area of villages, farms and forests totally uninhabitable.

The biochemist is Zhores A. Medvedev (not to be confused with his brother, scientist Roy A. Medvedev. Zhores Medvedev was banned from the Soviet Union in 1973 because of his widely published criticisms of the political suppression of Russian scientists. Three years later in 1976 he wrote an article on the persecution of dissident Russian scientists for the British magazine, *New Scientist*).

In this article Mr. Medvedev mentioned, almost in passing, the Urals nuclear disaster. He now says he assumed that the Western world was well aware of the accident since it was widely talked about in Russia despite the official secrecy surrounding it. Thus, it was to his surprise that the Western press, particularly in London, put his mention of it in headlines.

What was even more surprising, Mr. Medvedev asserts, is that Western scientists and officials denied the accident had occurred. A top British atomic energy official called the account "rubbish" and the Central Intelligence Agency in the U.S. claimed there had been only a minor accident at a Soviet military reactor at that time.

The miffed Russian set about to prove his story and "Nuclear Disaster in the Urals" is the result. To those of us who somehow missed the brief 1976 controversy, the newly published book is a bit of a shock. Mr. Medvedev's argument is so persuasive that one wonders not whether it happened but how and why news of the accident was kept secret for so long and why, when it was mentioned publicly, there were official attempts in the West to discount it.

The Russian biochemist doesn't rely on eyewitness accounts or leaked classified information for his evidence of the Urals disaster. Instead, he turns to research reports published openly in Soviet scientific journals. Like Sherlock Holmes, who found the most significant clue was that the Baskervilles' hound didn't bay, Mr. Medvedev finds the greatest significance in what some of these research reports fail to say.

For example, one A. I. Ilenko reported in 1967 on the seasonal variations in the death rates of field mice exposed to various levels of radioactive strontium. The report implies the experiment was conducted on a one hectare (2.4 acres) plot "artificially contaminated" by the strontium. A map, published later, of the plot shows the radioactive strontium is distributed over the land in a completely random pattern rather than the geometrically regular pattern that would mark a planned experiment.

Later, the same scientist reports the levels of strontium in the bones of 1,000 wild, small animals of various species trapped the year following the field mouse study. To trap this many small animals in the wild, the scientist would have to be studying an area of 100 to 200 hectares, Mr. Medvedev argues.

In neither case does the report say where these experimental plots are located, how they were "artificially contaminated" and only that by 1964 and 1965, when the animals were studied, they had been living in a radioactive environment "for a long time." The levels of contamination are reported only in "millicuries per square meter" without giving the total number of square meters contaminated.

Slowly, almost to the point of tedium, Mr. Medvedev cites report after report. An experimentally contaminated pond turns out to be, judging from the number of fish caught for study, a lake so large it couldn't possibly have been contaminated deliberately. A study of deer indicates an area of 50 to 100 square kilometers was—and is—contaminated with radioactive elements far in excess of amounts used in experiments.

The ultimate picture pieced together by the biochemist is that in 1957 or 1958 an "accident" occurred in the region near the city of Chelyabinsk that threw radioactive debris in lethal concentrations in some spots, over an area of 2,000 square kilometers (almost 800 square miles). People were evacuated, many died, food sales

were banned, panic developed. The area is still contaminated and abandoned.

What was the accident? Here Mr. Medvedev has only speculation. He believes that in the 1950s, in their rush to produce the atomic bomb and catch up with the U.S., the Soviets began producing plutonium before they had worked out the technology of handling the highly radioactive wastes from the reactors. They simply poured the liquid wastes into trenches. The soil and water conditions permitted the residue plutonium to accumulate until an atomic chain reaction started underground, producing a tremendous amount of heat.

The result was an eruption similar to a "mud volcano" that spewed the radioactive reactor wastes over hundreds of square miles.

Mr. Medvedev's evidence that it was a nuclear volcano rather than a reactor "meltdown" is little more than the fact that this was the prevailing rumor in Russia for many years. But he does cite a rather disconcerting analogy to show that it could happen: U.S. weapons producers dumped radioactive wastes in trenches in the Washington State desert near its plutonium reactors. They later found the plutonium residue was tending to accumulate underground and, had the underground water conditions been different, a nuclear volcano might have occurred.

Perhaps the Urals disaster wasn't a result of the Soviets being any less careful or less knowledgeable than the Americans—just less lucky.

Mr. Bishop is the Journal's science editor.