Sverdlovsk: Anthrax Capital?

Soviet doctors answer questions about an unusual anthrax epidemic once thought to have been triggered by a leak from a weapons lab

SVERDLOVSK'S "mystery epidemic" of 1979 lost much of its mystery this month when a group of Soviet doctors came to the United States and met with scientists and reporters to give a firsthand account of what happened.

For 8 years, U.S. officials have voiced suspicions about an unprecedented outbreak of anthrax that occurred in April 1979 among the people of Sverdlovsk, a big industrial city in the Ural Mountains of the Soviet Union.

Since 1980 the U.S. government has said the epidemic was triggered by an accident of some kind, probably a leak from a secret military lab where a biological agent was being prepared. (The Biological Weapons Convention ratified in 1975 binds the United States and the Soviet Union, among others, not to stockpile or manufacture such agents.)

The Soviets, who failed to respond to these charges at first, eventually came out with a rebuttal. People had become sick, said the Soviets in 1980, from eating bad meat they bought from "private" butchers.

Three Soviet officials came to visit the National Academy of Sciences in Washington, D.C., on 11 April: Pyotr Burgasov, retired deputy minister of health; Vladimir Nikiforov, infectious diseases chief at the Moscow Institute for the Advanced Training of Physicians; and Vladimir Sergiyev, director of the Institute of Parasitology and Tropical Medicine. They gave the same explanation as in 1980, but provided many more details, convincing some long-time doubters that the account was true. U.S. intelligence officials still maintain a military facility was involved.

Among those who found the Soviet report plausible were Alexander Langmuir, former chief of epidemiology for the Centers for Disease Control, and Philip Brachman of Emory University, an expert on anthrax who served as a consultant to U.S. intelligence officials when they were seeking to interpret the incident in 1979 and 1980. The visit was organized by biochemist Matthew Meselson of Harvard University and funded by the John D. and Catherine T. MacArthur Foundation.

Anthrax is considered a serious health problem for rural and undeveloped nations but not one that afflicts superpowers. It may not be easy for a great socialist nation to admit that through negligence it permitted the worst outbreak of human anthrax on record. The embarrassment factor may be critical in this case. Burgasov himself said that official censors banned publication of reports on infectious diseases until 1985, when Mikhail Gorbachev came into office. But according to the Soviet doctors, Nikiforov has prepared a massive account of the Sverdlovsk incident, including 150 photos. Apparently it has not been cleared for release. U.S. scientists attending the Academy meeting on 11 April urged Burgasov to get the paper out as soon as possible.

Soviet Physicians

Answering questions on the Sverdlovsk case at Johns Hopkins School of Hygiene and Public Health. At the center is the senior official who directed emergency efforts, Pyotr Burgasov, former deputy U.S.S.R. health minister. At left is Vladimir Sergiyev; at right, Vladimir Nikiforov.

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The U.S. Administration does not buy the embarrassment theory of silence, however. Gary Crocker, a State Department intelligence analyst, remains skeptical of all official explanations, saying the Soviet physicians "had only a small part to play" and "just did not see the whole story." Their account, Crocker says, may be consistent as far as it goes, but "it does not answer all of our questions," particularly not those about military involvement. And even if it was embarrassing, he asks, wouldn't it have been better to disclose the facts rather than remain silent in the face of international accusations? This question assumes that Soviet civil servants think like U.S. civil servants, which they may not do.

Anthrax is a bacillus that lives in the soil and is sometimes eaten by grazing animals. Occasionally it infects workers or shepherds who come in contact with diseased hides, bones, or carcasses. In addition, anthrax is hardy. Frost does not damage the encapsulated spores, which have been known to live for decades in bone heaps where cows or sheep have fallen in a pasture.

The common result is a skin infection that can be treated with a heavy dose of penicillin. But if anthrax is inhaled or ingested, it can be intensely lethal. As Burgasov says, if you get an internal infection, "in 3 days you can order your coffin." The survival rate is small—25% under the best conditions. Inside the body, the bacilli outrun the natural immune responses, excreting a toxin that overwhelms the heart and other organs all at once.

These qualities appealed to weapons makers during World War II. The big powers began experimenting with anthrax, and the British, for example, secretly dusted an island off the coast of Scotland that is still contaminated today.

The citizens of Sverdlovsk did not have to look so far to find the bacillus. It has been endemic to the region for centuries. According to the Soviets, it has infected animals at least once at nearly 200 known sites within the province (oblast) of Sverdlovsk and more than once at 50 hot spots. The Soviet Union inoculates about 2 million high-risk workers against anthrax, known there as Siberian ulcer, giving protection that lasts 1 year. Burgasov says that "before the Revolution" in 1917 there were at least 15,000

Anthrax cases *were concentrated in southeastern Sverdlovsk. Meat arrived from Chelyabinsk.*

cases of human anthrax in Russia each year; by 1985 the number was down to 178.

The 1979 crisis, Burgasov recalled, began on the morning of 7 April when he received a phone call alerting him to a spate of deaths over the weekend among men fishing on the ice at Sverdlovsk. Nikiforov, an expert on botulism, flew out immediately. After examining the bodies, he tentatively identified the disease as anthrax. He set up a plan to channel patients into one hospital and began to treat suspected victims aggressively with near-toxic doses of antibiotics. The diagnosis was confirmed by bacteriological analysis on 10 April, the day the epidemic reached its peak with ten new cases. Anthrax was isolated from meat found in the apartments of those who died.

The epidemic ran intensely from 4 April to 19 April, then trailed off with less than one new case per day through 19 May, when it ended. All but one of the victims were adults, mostly heads of families. There were 96 victims in all, according to Nikiforov. Seventeen had skin infections and survived. Seventy-nine had intestinal infections; of these, 64 died. It is difficult to stop an intestinal infection, Nikiforov said, because the early symptoms are not severe or distinctive, but the disease moves quickly. Nikiforov neither saw nor learned of any cases of lung infection, and there were no victims among the military.

The source of the outbreak was traced to a single 29-ton lot of bone meal (cattle feed) sold in March from a factory in Aramil, 15 kilometers to the southeast of Sverdlovsk. It must have taken in and ground up the bones of animals who died the previous year of anthrax. Its product clearly contained live anthrax. An official investigation found that the factory did not follow the prescribed heating and pressure treatment methods. The feed it produced went to a state farm, where veterinarians inoculate the animals, and to private owners, whom state veterinarians often do not bother to visit, according to Burgasov. On the approach of the May Day holiday, animals are slaughtered, generally the weakest (in this case, the sickest) first. The meat from the private butchers is thought to have triggered the outbreak, Burgasov said.

The authorities set up roadblocks to check meat coming into the city, and according to Burgasov, they also conducted a house-to-house search. Advertisements warning of the danger were printed in the paper. More than 200 stray dogs were rounded up and killed because they might have taken meat from garbage cans. Curiously, an American scientist who happened to be in Sverdlovsk in April and June 1979, Donald Ellis of Northwestern University, says he was not cognizant of a crisis. "During the time I was there, I was free to move about, and I was not aware of any of the reported activity," says Ellis.

Responding to reporters' questions, Burgasov, Nikiforov, and Sergiyev said that none of their surveys turned up any sign of airborne anthrax. If the source of this epidemic was a catastrophic leak or explosion, they ask, why did the number of cases rise gradually to a peak and then trail off over a period of 6 weeks rather than exploding quickly in a 3- or 4-day burst? Why were there no pulmonary infections? Why were there no deaths among children, who spend more time outside than workers and should have been more severely exposed to a toxic cloud? Where did the alleged hundreds of victims go?

U.S. officials remain unpersuaded by the Soviet account. "We have no reason to amend our position," says Barbara Seiders of the Bureau of Verification and Intelligence at the Arms Control and Disarmament Agency. There is evidence, she says, that many more than 64 people died at Sverdlovsk and that the deaths apparently resulted from a leak at a "biological warfare facility." But the evidence is secret.

Despite the Soviets' insistence that every anthrax-infected body was strictly accounted for and buried in a numbered grave, U.S. officials claim that it would be "easy to fudge" the number of deaths. Likewise, they assume that the Soviet doctors are saying nothing about the military's role. The Americans claim to have "a significant amount of evidence that there was a heavy military involvement and that there were military casualties." Again, it is secret.

Crocker of the State Department points out that in the annual public declaration under the biological weapons treaty, the Soviets list a facility on Zvezdny Street in Sverdlovsk. It is described as a "military epidemiology sector," one that does not conduct work with pathogenic agents but studies the methods by which diseases spread. If the facility is not sensitive, he asks, "Why weren't we allowed to go there in the beginning?" And "Why aren't there people who write [about disease control] from Sverdlovsk?" If it is a sensitive military in-

AIDS in the U.S.S.R.

When asked about AIDS in the Soviet Union, the visiting Russians gave very different responses, reflecting perhaps a generational split in attitudes. Pyotr Burgasov, a retired army general and deputy minister of health, seemed to view the disease as an affliction of the socially aberrant. The younger doctor, Vladimir Sergiyev, director of the Institute of Medical Parasitology in Moscow and former chief of an AIDS research lab, was less judgmental and less certain that the Soviet Union has the problem under control.

Giving a "personal view," Burgasov said he did not think AIDS falls within the general category of sexual diseases. AIDS, he said, is a rare ailment transmitted by homosexual men, by unsanitary surgical instruments, and by intravenous drug users. In the Soviet Union, he continued, the homosexual problem is contained with an "administrative barrier." Those who are convicted of openly practicing homosexuality can be sent to prison for 8 years. The other aspects of AIDS can be attacked by raising sanitary standards. He did not see the need for a vaccine at this time.

Sergiyev politely offered a "different view." The AIDS epidemic is "just in its beginning" in the Soviet Union, he said, so the picture is quite different from that in the United States. So far, 3.5 million people have been screened for the HIV virus, mostly through tests at blood banks. About 120,000 foreigners have been tested as well, and of these 282 were seropositive for HIV. They have been "repatriated" out of the U.S.S.R. Sixty Soviet citizens have tested positive, more than half of them women. "Two or three" newborns tested positive. Sergiyev sees a particular risk that AIDS may be spread by prostitution. ■ **E.M.**

stallation, "What the hell is it doing?"

Questions of this kind may never be answered to everyone's satisfaction. Indeed, Crocker says that while he expects many scientists will feel that they have now heard a consistent story, he is beginning to think this case will go onto "history's junkheap" as one of the great unresolved controversies of chemical and biological weaponry. After many years, he says, he begins to feel "somewhat feckless" to continue arguing a point when no new evidence is available.

The important lesson to be learned, he says, is that signatories of future treaties must let investigators in to see the evidence immediately upon reports that there has been a catastrophe with international consequences. ■ ELIOT MARSHALL

Science Focuses on the Next Presidency

Revitalization of OSTP, science advisory mechanisms contemplated as the sun sets on the Reagan Administration and a changeover approaches

THE budget tensions of the past several years are causing leaders of the nation's science research establishment to reexamine their strategies for securing federal support for R&D. This issue set the scene in Washington last week at the 13th Annual AAAS Colloquium on R&D Policy for exchanges on research on priorities, science education, and political activism. A prime concern is the direction that federal science policy will take under a new president and how programs will fare in the 1990s.

A key question for scientists, educators, and industry is how research priorities will be set across the federal government in the future. And the role of the director of the White House Office of Science and Technology Policy (OSTP) and presidential science advisory committees in the next Administration are matters of strong interest. John P. McTague, vice president of research for Ford Motor Co. and former acting director of OSTP, told colloquium participants that the White House agency could be more effective than it has been in recent times.

What is needed, he says, is "a high quality, full-time, broadly experienced staff to formulate policy options." Besides having adequate resources, McTague added, the director of OSTP must have "easy access" to the President and executive-level councils.

With respect to need for an outside presidential advisory council, David Z. Robinson, executive vice president of Carnegie Corporation, said the current White House body is insufficient. "I agree with Frank Press* that a 2-day a month science advisory committee is not worth very much," commented Robinson, who previously worked at OSTP. "It requires a commitment on the part of the individuals. . . .I would say, somewhere between a third and half time. . . ."

John Holmfeld, a senior staff member of the House Science, Space, and Technology Committee, says the President needs the advice of OSTP and that of an advisory committee. But he stressed that "resource allocation should not be the job of the science adviser." Otherwise, Holmfeld said, "[the advisory committee] will inevitably be seen as an interest group with an agenda of their own and priorities of their own."

Priority setting in the federal research sector continues to be controversial, especially as it affects the allocation of dollars between big and small science. Representative Doug Walgren (D–PA), chairman of the House subcommittee on science, research, and technology, noted that it may be necessary in the future to give priority to research on the basis of its potential to yield near-term benefits to society.

In particular, Walgren cited university-based research and education as being critical. He rated the doubling of the National Science Foundation's budget as a "highest priority." At the same time, Walgren attacked the Superconducting Super Collider (SSC) as a project that would "threaten not only research projects in high energy physics, but also sustained support for programs in other fields of science."

Also striking out at the SSC was Senator Tom Harkin (D–IA), a member of the appropriations subcommittee on labor, health and human Services, and education. He said the nation must reevaluate its commitment to "glamorous, big-ticket projects" like the SSC, space station, and Strategic Defense Initiative ". . .when the greatest progress is likely to come from thousands of smaller efforts."

But Alvin W. Trivelpiece, executive officer of AAAS, challenged assertions that the United States is too poor to undertake large projects while maintaining other essential research programs. He called on the scientific community to broaden its perspective on the needs of the nation. In particular, he said the country must pay more attention to science education at the primary school level. "You need to think about the entire system and we don't," commented Trivelpiece. "Most of us tend to work in the upper end of the system and we worry about it from a university or college point of view."

In any case, the research community is certain to have a limited amount of federal resources available to it, said Robert M. Rosenzweig, president of the Association of American Universities. Trade-offs will have to be made between research and capital spending, he said. What is critical, Rosenzweig said, is that such decisions be informed ones. "Choices that are made without regard for the opportunities that will be foregone are not serious choices."

The most critical factor, however, that may affect the outlook for the research community in the 1990s will be its level of political involvement. Indeed, Harkin challenged colloquium participants "to use your expertise and knowledge to become a political force. . . ." That view was echoed by McTague. "The pervasive importance of science and technology in the major societal issues," he said, "argues for and indeed requires greater involvement of the technical community in the political process as a whole. . . ."

Trivelpiece was more direct. "We need to try to fight harder to insure that in this present day of extremely difficult competition for resources that science and technology gets the resources [it needed]," he said.

Trivelpiece suggested that the scientific community needs to alter its approach to the federal budget process. He noted that the farm community would not passively accept price supports for just one commodity—wheat, corn, or tobacco, for example. "They don't do it. They don't circle the wagons and shoot inwards and kill each other. They fight back very hard," he observed.

*Frank Press was science adviser to President Carter and currently is the president of the National Academy of Sciences.