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National
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Center

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Soviet Biological Warfare Agents: Probable Cause of the Anthrax Epidemic in Sverdlovsk

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[REDACTED]

**Soviet Biological Warfare
Agent: Probable Cause of
the Anthrax Epidemic in
Sverdlovsk**

Summary

[REDACTED]

Evidence that the accident involved a BW agent, though circumstantial, is compelling. The virulence and persistence of the infectious agent were significant enough to force the Soviets to impose a quarantine in parts of the Sverdlovsk area that may have lasted until early June. In contrast to natural epidemics, where all available public health resources are used, early in the outbreak the Soviets employed military forces almost exclusively in the control of this disease and concealed the exact nature of the outbreak. The release of large quantities of anthrax spores, a candidate BW agent, offers the most logical explanation for the sequence of events that occurred in Sverdlovsk during April and May 1979.

[REDACTED] Such a quantity of anthrax spores would explain the large number of deaths, the Soviet difficulties in containing the disease, the limited effectiveness of treatment and prophylaxis, the need for spraying buildings with a disinfectant, the clinical findings characteristic of pulmonary anthrax, and the associated military security [REDACTED]

[REDACTED]

[REDACTED]

Soviet Biological Warfare
Agent: Probable Cause of
the Anthrax Epidemic in
Sverdlovsk [REDACTED]

Background

[REDACTED]

[REDACTED]

The Soviets did not make any official public announcement about the incident until February 1980, when TASS-International Service called a West German newspaper account of a biological warfare-related accident unfounded, anti-Soviet propaganda. To allay public panic during the incident, officials in Sverdlovsk reportedly announced that an outbreak of Siberian ulcer (the Soviet term for anthrax) had occurred. However, the accident aroused official concern, and it was rumored that Defense Minister Ustinov and Health Minister Petrovskiy arrived in Sverdlovsk about two weeks after the incident began. [REDACTED]

Site of the
Accident

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] The accident resulted in the escape of a virulent bacterial agent that reportedly drifted south, contaminating the Vorochmet section and the southern outskirts of the city. Within a week of the accident, victims of the disease began to enter civilian hospitals in the area. Among the first victims were military personnel at Cantonment 19, military dependents living at Military Cantonment 32, military reservists training in the area, and employees of a nearby ceramics plant. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Agent decontamination/disinfection efforts in southern Sverdlovsk reportedly involved quarantine, truck-mounted spray operations, earth scrapings, and the destruction of cattle and stray dogs.

[REDACTED]

[REDACTED]

Causative Agent

Available information indicates that the agent was an infectious disease-causing organism rather than a toxic chemical or radiation. The clinical course of the disease and Soviet treatment and disease control measures were consistent with a virulent disease. The victims reportedly suffered an influenza-type illness followed by sudden death. Antibiotics and vaccination were among the treatments and preventive measures. The

[REDACTED]

[REDACTED]

period of quarantine may have lasted from at least 18 April until early June, when health officials believed the disease situation was coming under control.

OK [REDACTED] The victims were transported to a hospital converted by the military specifically to treat the accident victims, and civilians were not permitted access. The situation apparently was viewed as a military security problem that could not be handled at the civilian hospital. If several hundred casualties required treatment because of a freak veterinary health problem, the public health facilities would have played a more important role.

OK The most likely disease agent was a virulent form of *Bacterium anthracis*, a bacterial spore, that can cause disease if spores enter the human body through open wounds in the skin, through consumption of contaminated food, or through inhalation. The route of entry dictates the clinical course of the disease and pathology, which can be distinguished clinically and at autopsy. More than 95 percent of the human cases of anthrax in the USSR are cutaneous, followed by the rarer forms of intestinal and pulmonary anthrax.

OK [REDACTED] The clinical symptoms observed among the anthrax victims in Sverdlovsk were high fever, possible brain involvement (convulsions), coughing, and frothing at the mouth, followed specifically by death. Autopsies of the victims indicated a severe pulmonary edema and general toxemia. These symptoms are similar to those observed in the acute form of pulmonary anthrax, which can run a swift, fatal course (within 24 hours) following a two- to six-day incubation period and mild illness. The sudden death is due to toxin produced by the bacteria.

OK In cutaneous anthrax, man usually acquires the infection through minor wounds, abrasions, or scratches in the skin while handling anthrax-contaminated animal materials. The respiratory version is acquired when dust particles laden with anthrax spores are inhaled into the lungs (wool sorters' disease). Although man-to-man transmission of anthrax is rare, mechanical transmission of spores on clothing and other materials could account for the apparent communicable appearance of the disease as reported in Sverdlovsk.

OK Another form of this disease in man is intestinal anthrax, caused by the ingestion of contaminated meat or milk. This is a rare human disease, because the human intestinal tract is relatively resistant to anthrax infection. When it does occur, it causes ulceration of the intestine and if not treated often results in death. (U)

OK
Anthrax spores, unlike most biological pathogens, are highly resistant to environmental stresses, often remaining viable in the soil for many years. This characteristic, plus its capability to cause lethal disease in humans, has made anthrax an internationally recognized candidate for biological warfare. Since the 1940s the Soviet military establishment has conducted considerable research on aerogenic infection of anthrax and has developed antianthrax vaccines for humans and livestock. The livestock vaccine apparently has reduced the natural incidence of the disease in the USSR. Mass administration of anthrax vaccine as an aerosol was designed for humans as a defense measure against biological warfare.

OK
The USSR reportedly vaccinates laboratory and animal industry personnel using a live attenuated vaccine administered subcutaneously. The efficacy of this Soviet vaccine for personnel exposed to respiratory infection is unknown. Soviet treatment of anthrax reportedly involves the use of antibiotics and antitoxin. Prompt treatment probably is effective against cutaneous anthrax, but its effectiveness against respiratory infection is doubtful. (U)

Possible Scenarios

[REDACTED]

[REDACTED]

Natural Outbreak of Disease

OK
The Soviets have blamed the Sverdlovsk outbreak on anthrax-contaminated meat, implying an epizootic among local herds. We view this as unlikely in the Sverdlovsk area, where anthrax is not a serious endemic problem. A natural outbreak of anthrax among cattle in the Sverdlovsk area during April before the animals begin to graze is possible but unlikely. The period of highest disease risk is during the summer and fall. Furthermore, intestinal anthrax is a rare disease in the USSR and would not be expected to cause more than a few cases among healthy adult Soviet citizens, even if anthrax-contaminated meat had been consumed in the city. (U)

[REDACTED]

OK

Anthrax is a serious bacterial disease of grazing animals, is transmittable to humans, and remains a significant veterinary and public health problem, particularly in the southern half of the USSR. Outbreaks among humans rarely affect more than a few individuals, and control measures are confined to an infected animal herd or a specific shipment of anthrax-contaminated hides. Such an outbreak in the Soviet Union would not justify a quarantine over a significant portion of an urban area. Thorough cooking of the contaminated meat probably would have been sufficient to control this type of outbreak.

[REDACTED]

Research-Related Accident

OK

Any of a number of research-related accidents could have resulted in accidental exposure of personnel to lethal anthrax spores or another virulent disease agent. Concentrated infectious agents used in research involving vaccine development usually are in quantities of less than a gram or milliliter, because these quantities have agent concentrations sufficient to infect hundreds of test animals under control conditions. An accident involving research quantities of agent could infect those laboratory personnel in the same room or at worse get into the ventilation ducts and expose personnel served by the same ventilation system.

OK

In this scenario the quantity of agent would be too small to result in an outbreak of disease outside the building where the accident occurred, unless unwitting exposed laboratory workers carried a communicable disease outside the facility, and secondary cases among relatives resulted. This is a possible but unlikely event in view of the information which indicates the disease was not communicable. In addition, because of the short incubation period, and the probable small number of initial cases, the outbreak should have been under control within two or three weeks and should have resulted in too few casualties to justify a two-month quarantine.

[REDACTED]

[REDACTED]

[REDACTED]

Accident Involving a BW Agent

OK

It is possible for researchers to become infected by BW agents, including anthrax, because of carelessness. Accidents involving pressure valves, heating systems, volatile gases, and spray dryers have potential for causing an explosion that could vent disease agents outside the building. Depending on the quantity released, type of agent, and the local weather conditions, an agent cloud could result in outbreaks of disease downwind from the accident site.

[REDACTED]

[REDACTED]

**Implications for
the 1975 BW
Convention**

On 10 April 1972 the Soviet Union, United Kingdom, and the United States signed the Convention on the Prohibition of the Development, Production, and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction. This Convention officially went into force in March 1975 after ratification by the depository states. Under the terms of the Convention, the parties "will not develop, produce, stockpile, or acquire biological agents or toxins of types and in quantities that have no justification for prophylactic, protective, or other peaceful use, as well as weapons and means of delivery." There is no provision for on-site inspection, and compliance with the provisions of the convention is based primarily on international trust. (U)

- Certain key points, however, provide compelling circumstantial evidence that the Soviets have maintained an active BW program at the Sverdlovsk facility since at least 1972:
- The probable accident site is a heavily secured military installation suspected of conducting BW agent research and development since the early 1950s.
- Major new construction activity at the installation during the 1960s included buildings suitable for production and storage of BW agents.