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Foreword

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The military-industrial complex of the former Soviet Union used the territory of Kazakhstan as a testing ground for various types of weapons of mass destruction, including nuclear weapons at Semipalatinsk. Soviet officials perpetuated the myth that the test sites were harmless and categorically denied any adverse effects on the Kazakhstani people, whose deteriorating health they sought to explain as a consequence of natural factors. In fact, the grave environmental and health effects of nuclear weapons testing at Semipalatinsk are now clear. Less well known are the consequences of biological weapons testing on the territory of Kazakhstan.

From 1936 to 1992, Vozrozhdeniye Island, an island in the western part of the Aral Sea whose territory is divided between Kazakhstan and Uzbekistan, was the major proving ground in the Soviet Union for the open-air testing of biological warfare (BW) agents. According to information provided by Z. A. Rakhmatulin, the former chief of staff at the test site during the 1980s, and by G. L. Lepyoshkin, the former general director of the National Center for Biotechnology in Stepnogorsk, a variety of BW agents were tested on Vozrozhdeniye Island, including the microbial pathogens that cause plague, anthrax, Q-fever, smallpox, tularemia, and Venezuelan equine encephalitis, as well as botulinum toxin. Some of the pathogens tested in aerosol form were genetically modified strains that produce atypical disease processes and are resistant to existing medications, potentially complicating diagnosis and treatment.

The environmental consequences of such tests were sometimes dramatic. In 1984 in the Volga-Ural steppe, and again in 1989 in the Torghai *oblast*, hundreds of thousands of *saiga* antelope died over a short time. These massive die-offs were officially attributed to outbreaks of pasteurellosis, a disease caused by the bacterium *Pasteurella haemolytica*. Yet they were almost certainly the result of open-air BW testing on Vozrozhdeniye Island. It is also known that during the late 1980s, large quantities of anthrax spores that had been mass-produced and stockpiled in Russia were transported to the island for decontamination and burial.

There are conflicting opinions on the dangers posed today by the legacy of BW testing on Vozrozhdeniye Island. Experts from the former Soviet military-industrial complex who worked on the island contend that the extermination of rodents from testing areas prior to the release of live BW agents, and subsequent clean-up operations, completely removed any danger that infectious agents would persist for long periods. Soviet officials also counted on the intense solar radiation during the summer months to disinfect the testing grounds after they were closed down.

Other experts disagree. Ultraviolet radiation can kill only exposed, living microbes and viruses—not bacterial and fungal spores

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that persist beneath the surface of the soil. Moreover, because of the extensive downwind range of the tests, and the possibility that some of the microbes could have infected insect or animal hosts (such as fleas or rodents) that serve as persistent reservoirs of disease, infectious agents may have spread throughout the territory of Vozrozhdeniye Island.

Today it is impossible to guarantee with any certainty the absence of dangerous biological contamination at the former BW test site, which remains a potential health hazard not only to the population of Central Asia but to other peoples as well. Because of several factors—the rapid shrinkage of the Aral Sea, which recently turned Vozrozhdeniye Island into a peninsula of the Uzbek mainland; the plans for oil and gas prospecting by international oil companies; and the largely unregulated visits to the island by local people scavenging for abandoned metal and equipment—there is an urgent need to decontaminate and rehabilitate the former BW testing grounds. Solving this problem will require a comprehensive approach and the participation of specialists with a variety of expertise.

The world has no experience with cleaning up the contamination caused by biological weapons testing on such a large scale. Great Britain performed some remediation at its former BW test site on Gruinard Island, off the coast of Scotland, which was used for testing anthrax bombs during World War II. Nevertheless, the challenge of cleaning up Vozrozhdeniye Island is vastly greater. Gruinard Island has an area of only two square kilometers, anthrax was the only BW agent tested there, the duration of the testing was limited, and the soil contamination on the island was largely a surface phenomenon.

The Soviet medical report contained in this special issue describes an unusual outbreak of smallpox in the city of Aralsk, Kazakhstan, in 1971. From August to October, a total of ten cases of smallpox were recorded, three of them fatal. The undeniable fact is that people in Aralsk became infected with smallpox at this time. How could the virus have suddenly appeared out of nowhere in the middle of Kazakhstan, a thousand kilometers from the nearest border?

In their report, the Kazakhstani specialists who helped to contain the outbreak identified two possible routes by which the virus could have reached the city. The first scenario was that a scientist participating in an ichthyological expedition in the Aral Sea became infected with smallpox when she went ashore at one of three port cities. She then passed the virus on to her brother, who lived in Aralsk and became the first of nine more people infected. The second possible scenario was that the virus originated in Afghanistan, where smallpox was still endemic at the time, and reached Aralsk from the southern border regions of Kazakhstan by land or waterway. This hypothesis is less plausible, because the disease could only have been transported from Afghanistan to Aralsk through Tajikistan and Uzbekistan. If people had become ill with smallpox in those republics, they certainly would have been detected, yet no such cases were reported.

In view of what has been learned in recent years about the former Soviet BW program, it seems that the most likely source of the smallpox outbreak was the test site on Vozrozhdeniye Island. Simply put, the index case and the nine residents of Aralsk who became infected with smallpox in 1971 were in the wrong place at the wrong time. They all suffered, and three of them died, because they were unprotected and had not been informed about the secret testing of deadly pathogens that was taking place nearby without their consent.

No one has ever apologized to the citizens of Aralsk for those who died in the smallpox outbreak, or to their relatives. I hope that the publication of this report will serve as a memorial to them.