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## The Hot Zone and the Cold War

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# THE HOT AND THE



ILLUSTRATION BY LEO PANDU

# ZONE COLD WAR

BY PETER NICHOLS



It was a time when, in the nation's schools, drills for nuclear war were as frequent as fire drills—when Americans and their Soviet counterparts lived with a constant fear of imminent worldwide destruction. “You had a cultural mindset that was apocalyptic,” said Robert S. Weisbrot, Christian A. Johnson Distinguished Teaching Professor of History at Colby, “that believed you could not guarantee that your wonderful suburban home and family and community . . . would survive ten more seconds.”

“It was not simply a matter of two countries that are adversaries building up weapons,” said Weisbrot. “Each saw the other as the incarnation of evil. And if you view an adversary as not simply a rival but as a devil, then you see anything as possible and even probable.”

We did survive the Cold War, unscathed if not unscarred. Yet the remnants of that superpower standoff survive in the literature of the period and in the knowledge that the weapons of that time have not disappeared. Frank Malinoski '76 and Daniel Traister '63 have spent years delving into the aftermath. For Traister it is the literary legacy of lives spent in the nuclear shadow. For Malinoski it is the super-secret world of biological weapons.

A set of Matryoshka dolls is lined up along the window sill above the desk of Dr. Frank J. Malinoski '76, M.D., Ph.D., assistant vice president of Wyeth-Ayerst Global Pharmaceuticals in suburban Philadelphia. The Russian dolls are nesting figures, and the biggest depicts Boris Yeltsin, with Gorbachev, Brezhnev, Stalin and Lenin in descending order.

Malinoski bought the dolls on the black market when he traveled on a secret mission to the former Soviet Union in 1991. It was before Yeltsin had come to power, so that dour-looking souvenir was a declaration of preference, a bold political statement. Malinoski was charmed by the growing temerity of the Soviet people, but, under the circumstances of his visit, the stacking figures may have called to mind Churchill's quip, as the Cold War got underway, about Britain's ally turned enemy: "It is a riddle wrapped in a mystery inside an enigma." Malinoski was in the Soviet Union in 1991 as part of a top-secret American-British team that journeyed to the heart of the "evil empire" on a 10-day inspection tour of facilities thought to be turning malign viruses and bacteria into biological weapons. When he left home to go looking for evidence of bioweapons research, Malinoski was not permitted to tell even his family where he was headed.

⊕ There were reasons for suspicion: a 1979 outbreak of anthrax in the city of Sverdlovsk, which killed nearly 70, and the chilling testimony of a Soviet biochemist who defected a decade later had convinced many in the diplomatic and intelligence communities that the Soviets had put together a bioweapons program in violation of the 1972 Biological Weapons Convention. At that convention they had promised "never in any circumstance to develop, produce, stockpile or otherwise acquire or retain" weapons or agents intended for biowarfare. But with no provision for verification, the treaty had no teeth.

In the late 1980s the biochemist defector Dr. Vladimir Pasechnik had reported a clandestine empire of research institutes, production plants and storage bunkers in the U.S.S.R.—more than 47 sites scattered across the vast nation. The network, dedicated to understanding and perfecting biological weapons, was funded and directed by the Ministry of Defense but was nested inside a civilian business conglomerate called Biopreparat. "The System," as it was known to insiders, had more than 40,000 employees, including 9,000 scientists who often carried both civilian and military identity cards.

Yes, they were making new medicines, but underneath that cover of legitimacy, they also were inventing new diseases. Products included new, more deadly strains of ancient scourges as well as monstrous chimeras born of the recombinant technologies spawned by genetic engineering. Despite vigorous denials that a



Russian soldiers check a store of chemical agents at a military base near Moscow in 1993, when Russian and American officials began a joint effort to safely destroy Russia's chemical weapons arsenal.

weapons program existed, mounting political pressure forced the Soviets to open four Biopreparat sites to Western inspectors.

Malinoski, a physician with a doctorate in microbiology, was responsible for the inspection team's medical support during the mission. "We didn't know what to expect there," he said, referring both to the kinds of infectious organisms they might run into and the unknown skills of Soviet scientists when it came to maintaining safety in "hot" labs. He immunized the team in advance against the most probable and most deadly illnesses and packed a laundry list of medical supplies, including a portable containment facility complete with orange biohazard suits.

⊕ Malinoski was enthralled by science from an early age. His favorite book growing up was titled *Yellow Fever*. A biology major at Colby, he spent his junior year in Wales studying oceanography and worked at Jackson Laboratories during and following his senior year. While earning a Ph.D. at Rutgers he decided a medical degree would provide some "real life" applications for his expertise. The Army paid for his medical schooling at the Albany Medical Center in exchange for a commitment of six years with the U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID) at Fort Detrick, Md. At one time the heart of America's own bioweapons initiative, the institute has worked strictly on biological warfare defense since 1969, when President Nixon unilaterally abolished the nation's offensive effort, which had started in 1942.

As a clinical investigator at USAMRIID, Malinoski did research to develop and improve vaccines for maladies that Americans might encounter as victims of germ warfare. "I was having a great deal of fun doing that," he said, explaining his value to the 1991 U.S.-British inspection team. "I became familiar with all the materials

related to the differences between offensive and defensive research. I had the experience to be another pair of eyes.”

⊕ “The biggest thing,” he said, “is what’s inside of somebody’s head in terms of their intent.” What’s locked inside someone’s head is not entirely hidden; it can be read in the configuration of laboratories and manufacturing plants that people ring around themselves to carry out their designs. To determine whether the Soviets were devoted to the science of life or of death, he says, inspectors needed more than the most sophisticated satellite surveillance. “You actually have to go inside those facilities and verify what’s going on. Certainly if they’re hiding things beneath levels of secrecy, or they’re trying to scale it up or figure out how to spray it behind a jet engine, or they’re trying to make it resistant to antibiotics or to ultraviolet light—you’re very suspicious of things like that.”

In 1991 the Soviets adroitly delayed the arrival of Malinoski and the inspectors to give themselves time to sanitize their facilities. Incriminating equipment as well as microorganisms were removed, and workers were not permitted on site the day of inspection. Soviet officials accompanying the inspectors answered questions in ways that were clearly scripted and usually trivial. “Everything was couched in terms of: ‘This is a defensive program, and you shouldn’t worry about it,’” Malinoski said. Useless, time-consuming speeches continually held up and shortened efforts to eyeball the sites, and an onslaught of Russian hospitality with plenty of vodka, cognac and caviar was aimed at deflecting and dulling the team’s attention.

“The most eye-opening part of the trip for me was the experience in Obolensk,” said Malinoski. The Institute of Applied Microbiology, just south of Moscow, was a sprawling site with 30 buildings—and it was just one of Biopreparat’s facilities. “We were doing a fairly good job [at biodefense] with two buildings at Fort Detrick,” he said, but the Soviet complex was mindboggling. The complex was embedded in a layer of armed guards, razor wire and motion and infrared detectors.

“These facilities were the typical Russian construction, which were sort of blocks-within-blocks or rooms-within-rooms,” he said of the biosafety architecture. One building at the site was an eight-story

structure that covered five acres. An entire floor was devoted to plague research and to *Yersinia pestis*, the bacillus that wiped out a third of Europe’s population in the 14th century. A few cases of plague break out each year in the Soviet Union, but this laboratory, Malinoski maintains, “had a commitment to understanding plague that was out of proportion to the epidemiological threat to the population.”

The team also spotted 40 giant steel fermenters at Obolensk—two-story behemoths, veritable buildings themselves—mounted inside the biocontainment section of the edifice. They had been sterilized, but their placement and scale meant that the great caldrons were designed to brew lethal bacteria in quantities far in excess of any legitimate commercial need, according to Malinoski. “The Soviets had no way to dismantle these long rows of huge fermenters. People’s jaws were hitting the ground seeing this stuff.”

After a day’s rest the team moved on for a two-day inspection tour of the Institute of Molecular Biology, known as Vector, in the Siberian larch forests near Novosibirsk. The mammoth compound contained 100 laboratory and administrative buildings. “Novosibirsk was even worse,” he said. “This was a huge campus where they were doing virology work, and clearly they had aerosol activities.”

One building housed a sophisticated computer for modeling the propagation of aerosols in diverse terrains and weather conditions. The Soviets claimed it was for optimizing the spraying of pesticides on crops, but the costly and innovative software was precisely the kind of technology that could calculate dispersal patterns for the powder-like pathogens a bioweapon unleashes.

The Vector scientists confided that they had studied the Marburg and ebola viruses extensively and had sprayed aerosols of the microbes on animals in test chambers. “They were defensive in terms of hiding their program,” said Malinoski, “but at the same time there was an arrogance about what they did. I think they were eager to actually tell us how far behind we were. . . . They said our vaccines might not protect us, which suggested that they had developed viruses that were resistant to American vaccines.”

During the inspection a technician let slip that the lab had been working on smallpox. “He probably didn’t realize how much he was supposed to be hiding,” Malinoski said.

**Biopreparat created mountains of engineered pestilence, including a 20-ton stockpile of freeze-dried smallpox. Technology for mounting it on missiles had been perfected.**

**The most efficient dispersal techniques were determined, and customized bioparticles were molded to maximize virulence. Biopreparat had delivered into the hands of the Soviet state the machinery to reap a harvest of death comparable to the grimmest nuclear war scenarios.**

Since antiquity, smallpox has been one of the great scourges of the human species. The virus preys only on humans, and *Variola major* kills about half of those it attacks and tends to infect nearly everyone else nearby. The World Health Organization (WHO) set up an eradication program that tracked down and choked off with vaccination campaigns every naturally occurring outbreak. The last case was isolated and treated in 1979, and the prodigious killer was declared eradicated the following year. By agreement, samples of the virus should have been alive only at official repositories in Atlanta and Moscow under the control of WHO.

The disclosure that Vector had possession of the virus was profoundly disturbing. Variola is an ideal weapon, especially now, when the world medical community has let down its guard. "Smallpox is a very hardy organism and can cause a devastating plague," Malinoski explained. "A whole generation is not immunized and is susceptible. . . . Everyone understood this was extremely serious."

When the inspectors departed, their worst suspicions had been confirmed.

**+** Founded by a Kremlin order in 1973, Biopreparat had set up the largest and most advanced bioweapons infrastructure the world has ever seen. Top students from the best scientific schools were recruited and offered unheard-of salaries, elite status and other perks. Most did not understand they were to work on biological weapons until they were already ensconced within the system. Dr. Ken Alibek, the first deputy chief of Biopreparat (1988 to 1992) and a colonel, was among them. Having pioneered innovations for a more lethal anthrax formula, he was an accomplished and ambitious bioweaponeer who worked his way up to become second in command. In his memoir, *Biobazard*, he writes, "Biopreparat, we believed, was our Manhattan Project."

Like many, he was raised to believe that the U.S. was in the vanguard of a world capitalist conspiracy and would stop at nothing, including the breaking of treaties, to overthrow socialism. The Soviet Union, he believed, should likewise stop at nothing to defend itself. A "staunch patriot," Alibek oversaw an enterprise whose deadly teeth included weapons-grade anthrax, Black Death, Marburg, smallpox and other scourges. Biopreparat created mountains of engineered pestilence, including a 20-ton stockpile of freeze-dried smallpox. Technology for mounting it on missiles had been perfected. The most efficient dispersal techniques were determined, and customized bioparticles were molded to maximize virulence. Biopreparat had delivered into the hands of the Soviet state the machinery to reap a harvest of death comparable to the grimmest nuclear war scenarios.

Alibek defected in 1992 after a reciprocal inspection tour of U.S. facilities (including USAMRIID) convinced him America had no offensive program. "Throughout my career," he wrote, "I had



Dr. Frank Malinoski '76, left, with Dr. Ken Alibek, center, and Dr. Christopher Davis. Alibek ran the biological weapons program in the Soviet Union before he defected to the United States in 1992. Davis is a British biological weapons inspector. The three were toasting the end of biological weapons secrecy and a new beginning for verifiable treaties to prevent biological weapons research.

worried that American scientists would surpass us. Now I found myself struggling to persuade them how far the science of germ warfare had come."

That same year President Yeltsin admitted what the West by then already knew, and he ordered the weapons program dismantled. From that point on, a downsized Biopreparat would be a privatized commercial venture—at least officially. The current Russian president, Vladimir Putin, has made no public pronouncements on the matter, but experts are skeptical that the civilian leadership has full control over the military. Four research institutes under the Ministry of Defense remain shrouded in secrecy, according to Dr. Jonathan Tucker, director of the Chemical and Biological Weapons Nonproliferation Program at the Monterey Institute: "The Russian military has refused repeated Western requests for confidence-building visits, raising suspicions that offensive research and development may be continuing there."

**+** When the Soviet empire dissolved into its constituent states not long after Malinoski departed, the socialist economy fell apart too. Once among the most privileged members of their society, many bioweaponeers found themselves without financial support. The U.S. estimates conservatively that there are about 7,000 scientists whose knowledge and skill would bring a handsome price on the black market—10,500 if you count expertise in chemical weapons. Some governments have set aside funds to help stanch "brain drain" by supporting peaceful research for cast-off weapons specialists, but most of the grants have gone to nuclear scientists and engineers.

In the fall of 1999 employees at Obolensk went without government pay for months. A director of another surviving institute remarked: "Now it is possible [for anyone] to buy strains because the scientists are working without bread." The Iranians are known

to have trolled those waters, bringing along a truckload of bread.

Dr. Amy Smithson, a senior associate at the Henry L. Stimson Center, has interviewed Russian bioweaponers. She reports, "it's an open secret" that many have traveled to Syria, Iraq, Libya, China, North Korea and elsewhere, "but they're not making confessions about doing weapons work. . . . Knowledge and seed cultures have definitely leaked, but we don't know where or what." Given the complexities of devising workable bioweapons, she adds, "this is the most genuine shortcut I know of for terrorists."

In the end, the Soviet Matryoshka doll could not contain its secret bioweapons empire. "I would describe it as scary," Malinoski said of his experience. "My role has been as an early observer of these gross violations of treaties and horrendous aberrations of good science. I think you have to be diligent about this kind of thing, just as you have to be with genetic engineering and research on the human genome. There is a dark side, if you will, to all of these things."

Still, he pronounces Alibek and Pasechnik, despite their achievements as bioweaponers, "the real heroes who put their lives and careers on the line telling the true story." The villains, he declares, are those in "the Soviet, now Russian, military-industrial complex" who knowingly deceived their brightest scientists and convinced them that work on offensive biological weapons was "justified."

"It wouldn't be true to say that I thought I was doing something wrong," Alibek has said of his own research. "The anthrax was one of my scientific results." He had perfected an anthrax strain with four times the death-dealing potency of standard weapons-grade. He tells of a high-level meeting he once attended with senior military officials who were looking for assurances that Biopreparat could produce sufficient quantities of his more vicious anthrax. They wanted to be able to load SS-18 missiles for a biological

attack on major American and European cities. Recalling his physician's oath to do no harm and feeling a need to atone, he confessed: "All I cared about was ensuring that our weapons would do the job they were designed for. . . . I don't remember giving a moment's thought to the fact that we had just sketched out a plan to kill millions of people."

 In the years since he backed away from the front lines of the superpowers' germ warfare front, Malinoski has worked as a private-practice physician, a research scientist who tested new vaccines for effectiveness and safety, a director of clinical research responsible for the licensure of pediatric vaccines and a senior executive in a medium-size biopharmaceutical company. At Wyeth-Ayerst he oversees clinical affairs for vaccines, administering research programs to evaluate the company's licensed products. The job is part science, part business management.

For a short time, Malinoski was vice president of a biotechnology start-up in the U.K. The company was developing vaccines that could be delivered through genetically engineered plants, a breakthrough that will someday allow antibiotics to be dispensed in wafers or juice instead of the standard injection. "The technology works," he attests. "We proved that while I was there." The company folded when investors pulled out in the midst of precipitous British reaction against genetically modified foods. "This is going to be a major way to improve the scale and cost of production, especially for developing countries. It's just ahead of its time right now," he said.

In the early 1990s Malinoski designed the clinical trials for Prevnar, the first new vaccine in a decade to become part of children's routine immunization. The drug was approved by the FDA in February 2000. "That's probably the product I identify most with," he confided. Prevnar prevents invasive pneumococcal disease, a bacterial infection of the blood or the lining of the brain and spinal cord. "Because pneumococcal disease globally kills about 1.2 million kids a year, the potential impact is enormous," he said.

Malinoski's career has followed an arc from basic virology research to its application in medicine to reducing morbidity and mortality by shepherding vaccines through the labyrinth of product licensing. "My day-to-day is definitely more administrative now," he said. "I'm comfortable with that because I can reach a lot more patients than I would if I were seeing maybe fifty a day in an office. I just wanted to get to the point where I have more impact on disease, and the best place to do that is prevention."

*Peter Nichols is the editor of PENN Arts & Sciences, the alumni publication of the School of Arts and Sciences at the University of Pennsylvania.*

Want to read more about Frank Malinoski '76 and the ongoing threat of biological weapons? Read *The Demon in the Freezer* by Richard Preston, in *The New Yorker*, July 12, 1999.



Dr. Frank Malinoski '76, left, works in a lab at Wyeth-Ayerst Global Pharmaceuticals near Philadelphia.