

THE SPECTRE OF SMALLPOX: IMPLICATIONS FOR BIOTERRORISM AND RESPONSE PREPARADNESS



Brian Frydenborg
Dr. Strong
Seminar in Terrorism
12/9/02

“Smallpox is the only disease we know of for which there were deities... It was the worst human disease. I don’t know of anything else that comes close. .”—D. A. Henderson, Director, Office of Public Health Preparedness, Department of Health and Human Services, and leader of the WHO’s Smallpox Eradication¹

“Dropping an atomic bomb could cause casualties in a specific area, but dropping smallpox could engulf the world.”—D. A. Henderson²

“If you look at the real world data from a 1972 outbreak in Yugoslavia, you find that the multiplier of the virus was ten: the first infected people gave it to ten more people, on average. Basically, if you don’t catch the first guy with smallpox before he kisses his wife, it goes out of control. We could be dealing with hundreds of thousands of deaths. It will absolutely shut down international trade, and it will make 9/11 look like a cakewalk. Smallpox can bring the world to its knees.”—Anonymous participant in the National Institutes of Health’s April 30th, 2002 secret meeting to model smallpox behavior³

¹ Preston, 212

² *Ibid.*, 103

³ *Ibid.*, 213

I.)INTRODUCTION: WHAT IS SMALLPOX

There is a family of mass murderers, whose last known victim was killed in 1978. In 1980, all officially known members of this family were declared dead or incarcerated. This family, in the twentieth century alone, is known to have killed more people than Adolf Hitler, Josef Stalin, and Mao Zedong combined.⁴ The members of this family are none other than the many strains of Smallpox, one of the deadliest diseases ever known to man. While it took twenty years for the HIV/AIDS virus to infect fifty-million people, it would take smallpox twenty weeks to do the same.⁵

Smallpox is a virus, known as *variola*. There are two strains, *variola minor* and *variola major*. *Variola minor* is also known as alastrim, and kills 1% or less of its victims, whereas *variola major* kills 30% of those who are unvaccinated. It usually spreads through the air in droplets that move from one person's respiratory system into another's; those 6-8 feet away are at the highest risk, but victims with a cough or an extreme form can spread the virus in a small particle of massed virus, known as an aerosol, that can stay in the air suspended for a time and can spread over a considerably large area.⁶

Though there are poxviruses for every kind of animal from mice to insects, *smallpox* is an exclusively human disease as far as natural cases go.⁷ From a completely

⁴ Sabine Vaccine Institute Website

⁵ Preston, 48

⁶ Henderson, 101

⁷ Preston, 31 and 51-52 Some animals have been infected with the disease in experiments that will be discussed later

objective analysis, smallpox enacts terrible suffering on all whom it afflicts. An infectious dose, though unknown, is suspected to be only a few virions, or particles of virus. During what is usually a 12 to 14 day incubation period but can range from 7-17 days, the virus spreads throughout the body. It is at the end of incubation when symptoms finally develop. They normally include “high fever, malaise, and prostration with headache and backache,” and “severe abdominal pain and delirium” sometimes occur.⁸ Coughing may also develop, which spreads virus particles even farther.⁹ This period of symptoms lasts from 2-4 days, and a patient is not always contagious during this time.¹⁰

What should be noted here is that, over a week after initial exposure to the virus, after vaccination can stop the spread of the virus, initial symptoms resemble that of the flu; initial misdiagnosis with smallpox is common. Until the rash breaks out, there is no way to tell that smallpox is actually is smallpox, and by then, it is too late; by then, several other people have already probably contracted the disease from the initial host of the virus. Yet it will be days before they come down with even the flu-like symptoms. Thus, “flare-ups” of smallpox when it was thought an outbreak had ended were common. Said Lawrence Brilliant, a colleague of Dr. Henderson who was part of the Eradication: “It is not enough to think that you’ve cornered all but that last one case of smallpox, because that last one can create those thousand outbreaks.”¹¹

After the initial symptoms, there is the development of an early rash, which lasts about four days, starting in the mouth and throat, and then spreading to the skin. After a

⁸ Henderson, 103

⁹ Preston, 28

¹⁰ Smallpox Factsheet, CDC Website

¹¹ Preston, 69

day the rash has usually spread to the entire body. Day 3 turns the rash into small pimples, and day 4 of this phase has the pimples filled with “a thick, opaque fluid.” After decreasing, the fever returns with a new intensity. During the pustular rash phase, which is usually 5 days long, the pimples are “sharply raised” and are “usually round and firm to the touch.”¹² Death usually occurs as this phase progresses to the next phase, the crusting.¹³ During the following 5 days, the bumps begin to crust and scab, and over the last 6 days, the bumps scab and fall off, leaving permanent scars where they once were. Only after the last scabs fall off is a person finally no longer contagious.¹⁴ In addition, when the bumps scab over, the fluid in them soaks the bed sheets or patient’s clothing; these materials remain infective for days after; in fact, this was how British troops infected enemy Native American tribes, to a devastating effect, during the French and Indian War(1754-1763).¹⁵ This was the first known use of smallpox as a weapon, and this tradition was (ineffectually) continued by several Confederates during the U.S. Civil War(1861-1865).¹⁶ All in all, the disease wholly incapacitates its victims for about 3 weeks, if they survive that long. This course covers about 90% of smallpox cases; the other forms are even more gruesome and are almost always fatal, causing the victims’ skin to blacken or to fall off in sheets.¹⁷ In all cases, the victim displays a mercilessly heightened sense of awareness,¹⁸ which means that he or she feels every iota of excruciating pain that the bumps, growing and multiplying, ripping their victims’ skin off its foundations, spreading into the anus, ear canals, sinuses, and eyes, cause.

¹² CDC website

¹³ Henderson, 105

¹⁴ CDC website

¹⁵ Tucker, 20

¹⁶ *Ibid.*, 32

¹⁷ Henderson, 105

¹⁸ Preston, 48

To say that smallpox is contagious would be an understatement, then. The estimates for the average number of people that one infected person can spread the virus to ranges from 3 to 20;¹⁹ in a lone, isolated case in Meschede, Germany, in late 1969-early 1970, one man confined to a single room in an isolation ward gave smallpox directly to 17 other people, and 80% of these cases were people on the floors above who had never even seen the man's face. He had opened his window to smoke cigarettes and the virus has traveled up the side of the building, much like smoke, into the rooms of other patients through their open windows. The outbreak was barely contained in time. Had the people been vaccinated a little later, there is a good chance that each of the 17 people could have infected 17 others, but the 3rd wave, because of timely vaccinations, consisted of only 2 people. Only 4 died in this minor outbreak, but this low number was only due to timely action by the officials concerned, and it should be noted that smallpox was a disease which then existed in nature and with which most public health officials were prepared to deal.²⁰

Not only is smallpox spread through close contact through the air, but, as is seen in the case just mentioned, it can travel long distances suspended in the air in aerosol form.

In addition, it is crucial to note that, historically speaking, smallpox has ravaged populations that were unaccustomed to its presence; it was the single greatest killer of the Native Americans, and was Hernan Cortez's greatest ally in his conquest of Mexico. He was largely able to walk in unopposed because the disease, spread by a single infected slave of his, had incapacitated or killed most of the natives and had demoralized most

¹⁹ Preston, 47

²⁰ *Ibid.*, 25-48

survivors. By the time Francisco Pizarro arrived in the Andes, the great Incan Empire had already been brought to its knees by smallpox, and smallpox wiped out most of the native Caribbean population. In addition, about 90% of the native population in the Massachusetts Bay area was killed by smallpox in an epidemic which lasted from 1616-1619, just before the Puritans arrived. John Winthrop noted that “The natives, they are near all dead of the smallpox... so as the Lord hath cleared our title to what we possess.”²¹ In just over 300 years, smallpox was the leading factor in a depopulation of two whole continents, North and South America, from a population of about 72 million to a population of about 600,000.²² It may have been part of the death-knells for classical Rome and Athens,²³ as well, and has killed countless monarchs and princes, shaping the fortunes of the world. Smallpox changed the course of civilization before, and it may yet still.

II.) WHY SMALLPOX AS A WEAPON

There are several major reasons why smallpox is considered for use as a weapon.

It is certainly one of the worst human diseases when one considers several of its qualities: 1.)the disease is highly contagious, 2.)it inflicts unbearable suffering on its victims and incapacitates them for weeks, 3.)it is incurable unless a vaccine is administered quickly after exposure, 4.)its symptoms do not appear until at least a week after exposure, and 5.)it is very easy and inexpensive to disseminate and spread, as well as to cultivate and weaponize if one already possesses live strains of the disease.

²¹ Tucker, 11

²² *Ibid.*, 12

²³ *Ibid.*, 7

As discussed, the disease can be highly contagious. While there is some debate as to how contagious the disease is, with a small minority feeling that it is hardly contagious, cases like the one in Meschede seem to indicate that it is much more contagious than it is not contagious.²⁴ Accounts from those who were on the front lines of the Eradication describing how people would think they had finally stopped the disease only to see how “it would rise out of nowhere and everywhere, coalescing out of brush fires into a viral crown fire” further support the theory that smallpox is a highly contagious virus.²⁵ Two cases in New York in 1947 led to 6.3 million vaccinations; 60 in the United Kingdom led to 5.5 million vaccinations there during the winter of 1961-1962.²⁶ Clearly, those who favor smallpox being highly contagious held the upper hand in the debate then as they do now. In fact, Israel has just ordered enough vaccine to vaccinate its entire population, and the United States is in the process of doing the same. Ken Alibek, the former head of the secret Soviet biowarfare program, discusses some of the strengths in his account of the work that went on in the U.S.S.R., unbeknownst to the rest of the world:

As our technical ability to create aerosols improved, we found they could be used to greater effect than some bacteriological munitions, especially in the case of diseases spread through direct personal contact. Fewer than five viral particles of smallpox were sufficient to infect 50 percent of the animals exposed to aerosols in our testing labs. To infect the same percentage of humans with anthrax would require ten thousand to twenty thousand spores. For plague, the comparable figure is fifteen hundred cells. The differences in quantity are too minute to be discernible to the naked eye, but they are significant if you are planning attacks on a large scale. Smallpox requires almost no concentration process.²⁷

Also keep in mind that virus particles are much, much smaller than cells.

Secondly, the suffering inflicted by the disease is so great that it incapacitates its victims for weeks. Even though only roughly 30% die from smallpox, the other 70%

²⁴ Preston, 47

²⁵ *Ibid.*, 71

²⁶ Tucker, 49

²⁷ Alibek, 115

suffer even more as they are awake and conscious even longer than those who die; their skin is ripped from their body and sensitive cavities pustulize, and they are scarred all over their bodies for life, heavily on the face. A large outbreak could cripple an army's fighting ability, and this occurrence has happened countless times in history, changing the course of wars against those inflicted. It could also cripple an entire city; Meschede shut down completely for quite some time while the outbreak there was contained.²⁸ If this had happened in a place like Berlin, the economic costs of shutting a city down for weeks would be huge. Thus, as a weapon of terror and as an economic and military weapon, (provided one protect one's own troops) smallpox is frighteningly effective. So smallpox not only kills and incapacitates a large number of people, it also immobilizes all around the outbreak and shuts down civil society in the affected areas; due to the contagious nature of smallpox, free travel cannot be allowed to those who may have been exposed. Such freedom would only facilitate the spread the disease.

Thirdly, the disease, once acquired, is incurable unless a vaccine is administered within four days of initial exposure.²⁹ The problem, as mentioned before, is that no symptoms appear until at least a week, usually longer, after exposure. Thus, by the time smallpox is recognized, many times people who are coming down with symptoms have infected others who have spread out and whose movements are difficult to trace. Add to that how highly mobile today's population is and how easy it is to travel long distances, and that vaccines are not readily available as smallpox was declared eradicated in 1980, and the picture becomes even more grim.

²⁸ Preston, 38

²⁹ Henderson, 109

Fourthly, symptoms do not even appear until 7-17, usually 12-14, days after exposure. By the time a person knew that he had smallpox, he would already be incurable and would already have most likely spread the disease to many other people.

Think about this scenario: 3 men acquire smallpox 11 days before they fly home from vacation. All three live in different states. They begin exhibiting cold and flu-like symptoms on the flight home, and people suspect nothing. They spread the disease to a significant portion of those on the plane. A few days after being home, they come down with the rash and soon it becomes apparent that they have smallpox. Everyone they have seen since just before they left, those on the plane, and those whom they have seen since returning may have been exposed; unless all those people are tracked down within 4 days, smallpox will run its natural course on them and will also continued to spread. To find all the people from the flight alone will be difficult, and the more time that passes the more people that they, in turn, infect. The situation could start with 3 infected, and if they each infect 10 people on the plane, within 2 weeks that is 30 more people that must be tracked down before they even show symptoms to stop the spread of the disease. Failing that, each of them, if they each infect 10 people, brings the total to 300 cases (100 dead) within a month, then 3,000 cases (1,000 dead) 6 weeks later, 30,000 cases (10,000 dead) in 2 months, 300,000 (100,000 dead) in ten weeks, and 3,000,000 (1,000,000 dead) within 3 months. It started with 3 cases, and unchecked could spread to millions.

Even if a significant portion of those infected were found and vaccinated in time, unless it was the soon after the initial outbreak, it is easy to see how the outbreak would still spiral out of control in today's interconnected world. And while an advanced, industrialized nation would have a good chance of effectively containing smallpox if it

acted swiftly and decisively, it is difficult to see how any part of the developing world would have as much success. A government would need the means to track down, isolate, and quarantine these individuals, and unless authorities found them before they exhibited symptoms, they would then have to seal off wherever these people had traveled; this could be a whole city, or cities if the person was at any type of transit hub. Remember, only one person escaping notice would be enough to for a surprise flare-up.

Finally, it is a relatively inexpensive and easy weapon to deliver and to harvest. As far as delivery, a few people carrying spray bottles that one can buy in any CVS or supermarket could spray a liquid form of smallpox easily, infecting scores and starting major outbreaks. Think of the earlier scenario, instead of starting with 3 initial cases, say you had 30 terrorists spread out across the U.S. with spray bottles who were vaccinated that each infected 10 people. In two and a half months, 3,000,000 people could be infected. They would need only two things: access to the virus and spray bottles. Spraying from a tall building could prove very effective. The U.S. Government clandestinely concluded that briefcases modified to spray travelers at Washington National Airport would have infected 1 out of every 12 travelers, starting a huge epidemic that would have spread across the entire country.³⁰ In a addition, for the more sophisticated foe, smallpox can be loaded onto bombs and missiles and can survive explosions at high altitudes so as to disseminate over large areas of land, easily more than an entire urban area; a Soviet SS-18 ICBM could be launched to infect over 75-150 square kilometers.³¹ To grow the virus, preexisting access would be needed, but new virus could be grown by inserting smallpox into chicken eggs that would be heated while

³⁰ Miller, 60

³¹ Tucker, 154-156

the virus grew in the egg. The liquid virus that would develop in the egg could then be extracted and would be ready for use, and could be stored for 6 months to a year without losing any of its potency.³² The virus could also be more easily grown by infecting live cultured cells with the virus, and the smallpox would spread in the cells until it could be extracted in a liquid virus broth that would also be ready to go right into a spray bottle, if needed.³³ Any government with smallpox could easily practice at least the second growth technique, requiring less labor and care at an unimportant loss of viral concentration. By comparison, obtaining and delivering a nuclear weapon is much more difficult, takes much longer, is harder to conceal (all the prep for a smallpox could take place in a tiny warehouse or even a mobile lab the size of a van), and is much, much more expensive. As the authors of *Germs* eloquently state it, “Living munitions constituted cheap atom bombs.”³⁴

III.) WHY WORRY NOW

Smallpox was labeled such a menace, and it killed so many people, that a group of ideologically minded scientists decided they would attempt to “eradicate” smallpox from the face of the earth. How would this occur?

A British man named Edward Jenner discovered in the 18th Century that infecting humans with cowpox, a milder cousin of smallpox which was rarely fatal in humans, allowed the immune system to defeat future infections of smallpox with the immunities acquired from cowpox. He began infecting people with cowpox to prevent smallpox infection, which was much more effective and less dangerous than the process of

³² *Ibid.*, 147

³³ *Ibid.*, 146

³⁴ Miller, 62

variolation, in which people were infected with tiny amounts of smallpox through the skin, not the respiratory system, which was much less riskier than normal airborne infections of smallpox, and reduced the death rate from 30% to 1%. Jenner's method brought the chance of problems down several decimal points. Today, a different virus with similar properties, known as the *vaccinia* virus, is used to the same, even more effective effect. About 15 people out of every million will face life-threatening side effects from this virus, and one will die, but the other 999,984 people will be safe from smallpox.³⁵ Using this "vaccine," D. A. Henderson, then the Center for Disease Control's (CDC) head of disease surveillance, proposed in 1965 that a campaign to eradicate smallpox should begin. The Soviets had already been calling for such a campaign, and from 1965 on, the U.S. and U.S.S.R. were the leading partners in a program that would last 13 years and would span the globe, taking place even in countries engulfed by civil war, succeeding based on the sheer will and determination of those involved. They developed a technique called ring-vaccination, in which the site of an outbreak would be sealed off and everyone around the site would be vaccinated, infected with *vaccinia*, so that when *variola* came around, it would be unable to spread due to the immunities acquired from *vaccinia*. It was like cutting down all the trees at the edge of a forest fire; the Eradicators, like firefighters, prevented their enemy from finding new victims, and like a fire, the smallpox would simply die out.³⁶

Against all odds, they did it; the last naturally occurring case of smallpox developed on October 27th, 1977. They had eradicated smallpox from nature.³⁷ Yet, as

³⁵ Smallpox Symptoms Chart, CDC Website

³⁶ Preston, 57-61

³⁷ *Ibid.*, 76

Richard Preston ominously ends his *Demon in the Freezer*, “We could eradicate smallpox from nature, but we could not uproot the virus from the human heart.”³⁸

A year earlier, the World Health Organization(WHO), the body which formally ran the Eradication, formally asked all nations possessing stored stocks of smallpox to turn them into either the United States or to the Soviet Union, the only two countries in the world that officially today each have one acknowledged store of the virus.³⁹

Then, in 1989, a major player in a secret bioweapons program run by the Soviet Government defected to the United Kingdom and started talking. He talked about people loading smallpox into warheads. He made a lot of people very, very nervous. Half a year later, the British briefed the CIA. Yet even before this, back in 1988, the Americans had noticed Soviet missile tests that had freezers in the warheads, and eventually came to the conclusion that they had to have been loaded with bioweapons. So as Gorbachev talked about *glasnost*, the Americans and the British decided to test the rhetoric and demanded to inspect these sites that were supposed to be the center of this secret program. In January of 1991, they got their wish.⁴⁰

If these inspections turned up anything, it would prove that the Soviets had violated a 1972 treaty in which they, along with Iraq and a host of other countries, had pledged not to develop or maintain any biological weapons.⁴¹

The inspectors were surprised far beyond any degree they could possibly have anticipated. Giant vats, stories tall, used for storing deadly bioagents; huge aerosol test chambers, that, when asked if they could be entered, were said to be unsafe; (“They said

³⁸ *Ibid.*, 233

³⁹ *Ibid.*, 78

⁴⁰ *Ibid.*, 83-88

⁴¹ Tucker, 144

our vaccines might not protect us. This suggested that they had developed viruses that were resistant to American vaccines.”) an offhand mention by a lower Russian technician that they had been working with live smallpox virus; (later furiously denied to have anything to do with weapons development and claimed to only be smallpox DNA) and a barrage of barely believable denials that any of these facilities were used for weapons engineering; all these were what greeted the inspectors to their horror. As one inspector noted, “The fact is, they had been testing smallpox in their explosion test chamber the week before we arrived... The nerve of these people.” They were only supposed to have one storage place for smallpox. It became clear, too, that there were was more than the one official store of smallpox in the U.S.S.R., as the site they were examining was not Russia’s official repository registered with the WHO.⁴²

In 1992, the leader of the Soviet bioweapons program defected and was able to provide a much more complete picture of the scope and nature of the program. He would eventually publish a book called *Biohazard: The Chilling True Story of the Largest Covert Biological Weapons Program in the World—Told from Inside by the Man who Ran It*. He revealed that the Soviets had been making a supply of 20 tons of smallpox a year to be ready to be inserted into warheads at a moment’s notice for many years, each year’s stock replacing the last, and described in detail how they worked. He also told how the KGB had followed Soviet Eradication workers in India in the final years of the Eradication for the specific purpose of obtaining an especially strong, or “virulent,” strain of smallpox to be used in weapons research, and they found one, known as Vopal, or India-1. To this day Russian officials have not come forward with the details of this strain, or how it can be combated or effectively treated, or exactly how dangerous it is.

⁴² Preston, 87-92

The Soviets had even developed a 300-gallon reactor that, in course of a few days, could produce enough smallpox to infect every single person in the world 2,000 times over. In 1999, when Americans were finally allowed to see this reactor, they were told with a straight face that it was only a sewage treatment facility, and that, even though smallpox had been in this facility—at least publicly—since 1994, no smallpox experiments were conducted, they said, until 1997; these, of course, were for “peaceful” purposes.⁴³

The most troubling is what is NOT known: what happened to all the smallpox and other materials produced? The Russians never gave a straight answer, and, in cases like the question of whether the warheads were drained of smallpox or not, no answer is given. Tons and tons of smallpox, unaccounted for; the experts in designing it for weapons use, broke and desperate for work; rogue states and/or terrorists looking for just such weapons; these three things are a terrible combination. “The sixty-four-thousand-dollar question is what happened to the smallpox material for those warheads,” Preston quotes an American official who visited the Russian sites. Another American who spent time inspecting some of the Russian facilities told Preston “The Russians themselves have told us that they lost control of their smallpox. They aren’t sure of where it went, but they think it migrated to North Korea. They haven’t said when they lost control of it, but we think it happened around 1991, right when the Soviet Union was busting up.” Preston then takes the effort to point out that “A master-seed strain of smallpox virus could be a freeze dried bit of *variola* the size of a toast crumb, or it could be a liquid droplet the size of a teardrop. If a teardrop of India-1 smallpox disappeared from a storage container the size of a gasoline tanker truck, it would not be missed;”⁴⁴ hardly reassuring at all. Even

⁴³ *Ibid.*, 92-94

⁴⁴ *Ibid.*, 95

after September 11th, up through the end of 2002, the Russians have shown no desire to come clean about where all this material went.

These revelations, occurring in the early 90's, combined with the details of Iraq's bioweapons program and the 9/11 attacks, have catapulted smallpox onto the forefront of many policy makers' minds only recently, so it is only recently that we have been able to address this threat.

IV.)IRAQ

1991 was a big year for other reasons too. The World Health Organization, deciding that it no longer needed smallpox vaccine because the disease had formally been eradicated, destroyed 1,500,000 of its 200 million doses of the vaccine. And the Gulf War happened. At the end of Saddam's terrible gamble, UNSCOM weapons inspectors went into Iraq and, despite almost no cooperation whatsoever, were able to find lots and lots of scary weapons of mass destruction (WMD) programs. Preston interviewed Richard O. Spertzel, an UNSCOM inspector from 1994-1998, who told him that "There is no question in my mind that the Iraqis have seed stocks of smallpox." He notes that the Iraqis "formally acknowledged" to having a WMD program by 1974, and the experts place the start of that program during 1972, noting facilities that existed in 1974 would had to have started being built in 1972. That same year, smallpox erupted in Iraq. Preston quotes Spertzel as saying that "There would have been many samples of smallpox in hospital labs in Iraq after that outbreak... It is inconceivable to me that at just that time they were starting a biowarfare program they would have gone around Iraq and thrown out all their smallpox." He had even found a freeze dryer of the type used to cultivate and store viruses with the label "SMALLPOX" in Arabic. Yet the Iraqis claim

they were only working with camelpox.⁴⁵ Interestingly enough, the authors of *Germes* decided to title their section on Saddam's WMD programs *Secrets and Lies*.⁴⁶ Saddam kicked the inspectors out in 1998, with much to still be answered and explained. Days before from the writing of this paper, the Iraqis just submitted a 12,000 page, 12 CD-ROM report detailing how they have no WMD program. The same was said before and after the war, even while inspectors caught the Iraqis red-handed.

Finally, one must remember the historical relationship between the U.S.S.R. and Iraq; many of Iraq's tanks that faced off against the U.S. Armored Cavalry in the deserts of the Middle-East in 1991 were old Russian tanks, and a December 3rd, 2002 *New York Times* article details a CIA investigation into unconfirmed reports that a senior Soviet virologist who had visited Iraq in 1972 and 1973 also visited Iraq in 1990 for the purpose of delivering smallpox strains to waiting Iraqi government customers.⁴⁷ An intelligence report from May 1994 also raised the possibility that the U.S.S.R. had been aiding the Iraqi biowarfare program, and an additional intelligence report from Britain's MI-6 also placed Soviet biowarfare scientists in Baghdad in 1991, though whether or not this is the same link the CIA is exploring remains to be seen. Furthermore, some Iraqi POW's had been vaccinated for smallpox, and "Israeli sources of unknown reliability" maintains that Iraqis tested an extremely virulent form of camelpox on Kurdish prisoners, but the entire claim of camelpox itself may be cover for smallpox research. The Iraqis claim that as Arabs, they are immune to camelpox, while Westerners are not, is odd, considering it was tested on Kurds, other non-Westerners, if indeed it was camelpox and not smallpox.⁴⁸

⁴⁵ *Ibid.*, 96

⁴⁶ Miller, 124

⁴⁷ Miller, Judith "C.I.A. Hunts Iraq Tie to Soviet Smallpox," *New York Times* 12/3/02

⁴⁸ Tucker, 204-205

V.)ENGINEERING 101

Perhaps the most troubling revelation about smallpox occurred during September of 2000. Peter Jarhling, the senior scientist at the U.S. Army Medical Research Institute for Infectious Diseases (USAMRIID), was at a conference on poxviruses in France when he ran into an old colleague, Richard Moyer, who is an expert on poxviruses. The two of them came across a poster display set up by a group of Australian scientists who had been working with mousepox, which is nothing more than the mouse version of smallpox. They were trying to engineer a mousepox virus that would make the mice sterile, so they added a gene from the mouse, a gene called IL-4 that signals to the immune system, to the mousepox virus. Rather than sterilize the mice, it wiped them all out. Even 100% of the mice who had a natural immunity to mousepox were wiped out. Moyer “blurted” out, right in front of the display, “My God, Peter, can you believe what these jackasses have done?... If I were a bioterrorist, Peter, I would rip that paper down and take it home with me.”⁴⁹

Humans, too, have an IL-4 Gene, and the terrifying logic is that a person could insert that human gene into the human smallpox virus, and get the same result, a supervirus that mows through immunities like a scythe through wheat. Preston makes his readers even more nervous when he asserts that “Putting the IL-4 gene into a poxvirus was such simple work that a grad student or a summer intern could probably do it,” that “there were kits you could order in the mail for doing it,” that virus engineering is getting easier, and that “poxviruses were just about the easiest viruses to engineer in the

⁴⁹ Preston, 127-128

laboratory.” Those who did the research felt their work was not dangerous because they thought that the Human IL-4 *might* react differently, and that if a supersmallpox was possible, it would not be used because “it would kill too many people too fast,” maybe even killing the those who made it.⁵⁰

I do not see how that argument is either sound or reassuring: “it would be too good of a weapon, so no one would use it.” A book by Mark Jurgensmeyer called *Terror in the Mind of God* is all about how religious extremist terrorism—which is on a dramatic rise—has a goal of killing as many people as possible, and in some cases, like the Tokyo Subway Sarin Gas attack, the goal is bringing about the end of the world. For those featured in Jurgensmeyer’s book, such a supervirus may just be their ideal weapon. The Australians’ argument is not a convincing one. Henderson said such research “defines a whole new array of bioweapons, more awesome than any now known.”⁵¹

Preston visits another scientist who is working on repeating the mousepox experiment. This Dr. Chen, a Chinese-American, is “personally worried about engineered smallpox.” This Dr. Chen tells Preston that he learned from his old mentor in China that “the Russians have a genetically modified and weaponized smallpox.” He notes that his mentor wouldn’t tell him how he learned of this information, but trusts his mentor, a senior Chinese scientist, since “he has good access to information,” and finishes by noting that “Smallpox was all over the world thirty years ago. It could be anywhere today. It’s not hard to keep back a little bit of smallpox in a freezer.” Preston also tells us that a widely circulated textbook, *Current Protocols in Molecular Biology*, details exactly how to insert genes into a poxvirus. Chen notes that “The only difficult

⁵⁰ *Ibid.*, 128-131

⁵¹ Tucker, 259

part of it is getting the smallpox. If somebody has smallpox, all the rest of the information for engineering is public.” The experiment killed all mice with a natural immunity, but those vaccinated actually showed some resistance only if they had been recently (a few weeks prior) vaccinated. Still, this whole experiment had, in the estimate of Dr. Chen, cost only \$1,000 for each strain of smallpox tested. Preston, in typical dramatic fashion, concludes that “Virus engineering is cheaper than a used car, yet it may provide a nation with a weapon as intimidating as a nuclear bomb.”⁵²

VI.)NOT AS BAD AS IT LOOKS?

I personally had the chance to meet with, and discuss all of these issues with, Dr. Anna Johnson-Winegar, Deputy Assistant to the Secretary of Defense concerning Chemical-Biological Defense. She is the senior advisor to Secretary Donald H. Rumsfeld concerning such matters. In her expert opinion, Anthrax is the number one biological threat, as, according to her, it can be disseminated more easily and is more easily weaponized than smallpox. Yet she did admit that smallpox posed the greatest, if not most likely, threat. While this may seem contradictory, the difference is the view of which terrorists are more likely to use. Dr. Johnson-Winegar clearly has a good command of this field of knowledge, yet her argument, in the end, ended up sounding much like the Australian scientists’ argument that the weapon is so terrible and uncontrollable that no one would be stupid enough to use it.

In a world where suicide bombers blow themselves up on a near daily basis, and in which people hijack planes and fly them into buildings while they are still in them, where people release Sarin Gas into subways as a way to bring about the apocalypse, to

⁵² Preston, 222-225

put a bet on our safety that relies on terrorists thinking logically is not convincing to me. Sure, most terrorists have relatively palpable goals in mind, like the IRA or the secular Palestinian groups. But even the most rational terrorist groups' methods have occasionally transcended logic, such as the IRA bombings in London or the Palestinian suicide bombings by non-Hamas members of discos and buses in Israel. To trust the terrorist to be logical, especially after reading *Jurgensmeyer*, is to flat out make a mistake. What has been demonstrated is that terrorists, now more than ever, will do whatever they can to kill as many people as possible, and often care little for their own lives in relation to their "cause." What would stop Osama bin Laden from using smallpox against us? I doubt it would be his logic. And I doubt he would hesitate for even a second.

Dr. Winegar also believes that Iraq does not have the capability to engineer smallpox, nor does she seem to be inclined to think they have smallpox. Perhaps she has some intelligence data that refutes what others have said, but if Richard Preston can join Dr. Chen in engineering mousepox, I, for one, despite the opinions of Dr. Johnson-Winegar, as knowledgeable as she is in her field, seem to think that Iraqis, with the full backing of their government, can engineer smallpox.

Frankly, Dr. Johnson Winegar was the only qualified expert I found in the course of writing this paper that did not think smallpox was of greater concern than anthrax, yet she fully recognized how serious a successful attack with smallpox would be. I have found it difficult to find anything in print by a qualified expert that says either anthrax is a greater threat than that of smallpox or that smallpox does not warrant a top or near top priority of concern; if anything, I imagine terrorists' methods and mentalities would make smallpox that much more attractive as a weapon. Most terrorists are not going to have

sophisticated ICBM'S that are adept at spreading anthrax over large areas; if we are attacked with a bioagent, it will most likely be someone on foot spreading it, and in that kind of a case, anthrax, which is generally not contagious, pales in comparison to the effectiveness of smallpox. For the more rational terrorist, anthrax is a more controllable weapon, and so is plague, but again, I for one will not bet on the discretion of terrorists.

The U.S. Government seems to agree with the conclusion I have reached. The Centers for Disease Control and Prevention Website, on the home page, has a special section for smallpox right on the top; to get to anthrax, you need to go to the general bioterrorism section, and even then, smallpox is listed above Anthrax. Anthrax comes alphabetically before smallpox, so it at least *seems* that CDC feels that smallpox is the greater threat if it gives it so much more attention and prominence.

In addition, the Bush administration, even with a wholly unsolved anthrax case, is clearly making smallpox the priority; it is not spending the millions on methods to combat anthrax as it has on smallpox, and even though the military is already vaccinated for anthrax, (it will soon be for smallpox too) the Bush administration obviously feels the greater threat to the civilian population, even with one anthrax attack still unsolved, is smallpox. After all, it is putting so much effort into procuring vaccines for smallpox while no similar approach has been taken for civilian protection from anthrax.

While .Yes, Anthrax is not contagious, yet the amount of resources being committed to combat smallpox should be enough evidence as to which is viewed as the greatest threat.

Smallpox is more contagious and its manifestations are more ghastly and painful than anyone would even want to consider, and every survey book on bioterrorism I have read clearly states smallpox is the greatest threat; experts who deal with all sorts of

potential agents for bioterrorism that are the most prominent in their fields, like Henderson, Tucker, and Jahrling all agree on smallpox being the most serious biological threat. Richard Preston, author of *The Hot Zone*, decided to write about smallpox, after all, and only uses anthrax as a lead-in to smallpox.

VII.)U.S. POLICY ON SMALLPOX

As stated, the Bush administration has already moved ahead with several important policy initiatives concerning smallpox and bioterrorism. These issues were raised even before September 11th. As officials became more concerned about smallpox as more and more of the Soviet program's details became available to the public, the question was asked: could we deal with this?

Several exercises were conducted to see what would happen if the U.S. was attacked by terrorists using smallpox; one of the best was Dark Winter, harnessing the talents of experts in all of the necessary fields, simulating the decision process even of the nation's highest public officials, with Sen. Sam Nunn filling in as the President. The study, in all possible ways, was a total disaster; mass hysteria, panic, economic turmoil, suspension of civil society in affected areas, impending martial law even... all of these arose. Whole states shut down, and the National Guard had to be brought in to keep the health service system from collapsing, and still it did just that. The initial 50 cases in 3 states on Dec. 9th spread to 16,000 cases in 25 states and 10 foreign countries; by February 6th, 3,000,000 cases and 1,000,000 dead were the grim statistics with no end in sight by the end of the exercise.⁵³ After the exercise, Sen. Nunn exclaimed "I was honored to play the part of the President in the exercise **Dark Winter**.... You often don't

⁵³ Dark Winter Script, 14, 41, and 43

know what you don't know until you've been tested. And it's a lucky thing for the United States that - as the emergency broadcast network used to say: 'this **is just a test**, this is not a real emergency.' But Mr. Chairman, our lack of preparation **is** a real emergency."⁵⁴

In light of such exercises, D. A. Henderson testified to the U.S. Senate Committee on Foreign Relations about the threat of biological weapons a mere 6 days before the September 11th attacks. He stressed how unprepared we were especially when it came to training, and mentioned how “hospitals remain woefully unprepared.” He noted that in the last decade, 17% of U.S. hospitals closed, going to 6,000 from 5,000, and that even the 1999 flu flux “strained most hospitals.” Also citing a major staffing crisis, he recommended putting more effort into preparing the health system to deal with crises, more research & development for biodefense, that public health know exactly what they needed to improve on, increase intelligence gathering on bioweapons, and finally, to clearly condemn all research that went towards developing bioweapons. Yet more than anything, strengthening the public health system was his number-one recommendation.⁵⁵

Then September 11th came, and, thankfully, the Bush budget, while lacking in other areas of national security, came up big for biodefense. Dr. Johnson-Winegar specifically informed me that a lot of money was put into setting up new laboratories. The Bush administration is also worried enough about Iraq’s WMD programs that it seems it will go to war to disarm Hussein’s Regime; before he goes to war, though, he has taken steps to have enough vaccinations put on order, over 300 million, to vaccinate the entire U.S. population. Henderson was asked his opinion on the number of needed doses, and his response was 100-150 million. Yet the administration felt most Americans

⁵⁴ Dark Winter Summary and links page

⁵⁵ Henderson, Testimony to US Senate Committee on Foreign Relations, 5

would be more reassured knowing enough vaccine was available for everyone, even though 40-50 million Americans could not even receive the vaccine safely because of health complications. The U.S. was known to have about 15 million doses of Dryvax vaccine on hand, and it was found in studies that these doses could be diluted to about 75 million doses. However, after dilution, the vaccine would deteriorate faster, so the doses would have to be given soon after. Keeping this in mind, the CDC decided to use whatever new vaccines could be acquired in time before using the older. Thus, the timetable for a contract established with OraVax (which had just been purchased by Acambis) in mid-2000 for the production of more vaccine was accelerated to have 54 million doses instead of just 40 million ready by the end of 2002. The original timetable had the full 168 million doses ready by 2020, for a total cost of \$343 million. That was later modified to be a \$428 million joint venture between Acambis and Baxter International to develop 155 million doses in addition to the 54 million already ordered only from Acambis; this, along with the DryVax diluted vaccine, totaled 284 million doses. In a surprising development, 85 million doses of the Aventis Pasteur Corporation's smallpox vaccine were discovered in storage on March 28th, 2002. Thus, the good news seems to be that sooner, rather than later, there will be enough vaccine to go around for those who can benefit from it and the proven method of ring vaccination is to be used. Still, about 40-50 million Americans, with HIV or Eczema or other conditions, are unable to receive the vaccination, as it is not safe for them.⁵⁶

That was a big part of the reason the Bush administration decided not to reintroduce mass vaccinations. As mentioned before, the vaccine kills 1 out of every million and creates serious health complications in 15 out of every million. Many others

⁵⁶ Tucker, 245-246, 253, 255-256, 260, 264

will suffer very unpleasant but non-life-threatening illness, as *vaccinia* give its victims many of the same symptoms of smallpox if it flares up. Another problem is that the nature of vaccinations, given through the skin of the upper arm, can be contagious, and if a person inhales *vaccinia* particles, he will receive the full smallpox-like symptoms but will not be at any serious risk of dying. An even greater worry is the spread of *vaccinia* to those who are unable to receive the vaccines; such spreading would amount to serious health risks to those 40-50 million Americans.⁵⁷

Once it was decided that the entire population would not be vaccinated, at least not now, the decision remained, who would be vaccinated? Bush seems to have made three decisions concerning this policy. A plan to has already been made to vaccinate up to 500,000 military personnel, especially with the possibilities of Iraq possessing smallpox and a war that would mean Mr. Hussein's end, and Mr. Bush is expected, any day now, to announce that plan and one to vaccinate a 1st wave of 500,000 health care workers, with a second wave of 7-10 million health-care workers to come after.⁵⁸ In addition, major cities all across the country are being forced to turn in vaccination plans before the end of the year, from Washington to Chicago to New York.⁵⁹ The CDC also seems to have plans as to which agencies will have what jurisdiction in the event of a bioterror attack, itself having been upgraded to the lead role. This is especially important, since in simulations of bioterror attacks, jurisdiction issues were always key thorns in the side of response effectiveness. Thus, this plan is one of the greatest steps forward that the government has taken to combat bioterrorism. They also have a clear plan to transport mass quantities of vaccine should the need for them arise, and from secret, secure

⁵⁷ Preston 38-39

⁵⁸ Stolberg, "President Nearing Decision on Who Receives the Smallpox Vaccine," *NYT* 11/27/02

⁵⁹ Cardwell, "Officials Work to Meet Deadline for Smallpox Vaccination," *NYT* 12/1/02

locations too. The following is the breakdown, established September 2002, of the clear lines of authority in the event of a bioterror event, with the CDC clearly on top, taken from CDC's website:

- (1) **Office of the Director, CDC**
 - a. Coordinates overall CDC activities
 - b. Provides direct liaison with the Secretary of Health and Human Services and the Office of the Surgeon General

- (2) **NCID/NIP OD**
 - a. Consult with the Director of the CDC about agency policy decisions
 - b. Act as liaisons to other federal agencies (FBI, HHS, OEP, DoD, etc.) or assign personnel to act as liaisons
 - c. Designate personnel within their divisions for response activities
 - d. Act as liaisons or assign personnel to act as liaisons to international organizations, such as WHO

- (3) **National Smallpox Consultants** – Consists of non-CDC smallpox expert consultants from a list of national experts maintained at CDC; they provide additional smallpox expertise consultation for the CDC Director and NCID/NIP OD

- (4) **Central Operations Group** – Consists of personnel from NCID, BPRP, NIP, EPO, NCEH, STD/HIV/TB, NIOSH, PHPPO, and other CDC C/I/Os
 - a. Coordinate overall the CDC epidemiology, surveillance, and stockpile activities; serve as central location for tracking nationwide surveillance, epidemiology, and vaccination activities; maintain national surveillance database
 - b. Provide guidance to CDC field teams regarding surveillance, contact tracing, vaccination, and epidemiological investigation, and epidemic containment issues
 - c. Mobilize vaccine stockpile as directed by the CDC Director
 - d. Address resource needs of personnel in field
 - e. Provide technical expertise and assistance to state/local public health and medical authorities and federal agencies involved in response
 - f. Coordinate interstate and international tracing and notification of contacts
 - g. Coordinate internal CDC diagnostic laboratory activities
 - h. Liaise for external CDC diagnostic laboratory activities (USAMRIID)
 - i. Coordinate specimen collection and transportation strategies
 - j. Mobilize smallpox vaccine to states where cases have been identified

- (5) **CDC Field Team Liaisons** – provide direct CDC communications and support to assigned field teams

- (6) **CDC Field Teams** – Work directly with state and local authorities for outbreak control activities. Consists of the following personnel:
 1. Senior level physician/medical epidemiologist – team leader
 2. Senior public health advisors (number to be determined) – coordination and management of team; assist with implementation of vaccination strategies
 3. Medical epidemiologists (number to be determined) – assist with coordination of surveillance, epidemiological investigation, and infection control activities
 4. Medical epidemiologist (number to be determined) – coordinates activities for diagnosing, monitoring, and analyzing vaccine safety data

5. Laboratory scientist or technician (number to be determined) – advise local laboratories on specimen collection, handling, shipping, laboratory safety, and diagnostic protocols once an initial case is confirmed at CDC
6. Communications specialist – liaise between team and communications specialist at CDC and HHS, assist local health department press officers draft statements and materials, etc.
7. EISO/PMR/PHA – additional staffing resources as needed

(7) State Liaison Teams – Assigned as CDC liaison and contact for states without CDC field teams to provide general overall support to states⁶⁰

VIII.)SO DO WE STILL HAVE ANYTHING TO WORRY ABOUT?

The vaccines should be ready, a clear command structure has finally been established, so is there anything else that needs to be done? Unfortunately there is too much.

While these steps are miles ahead of where we were a year ago at this time, the greatest problem remains in the state of the nation's health industry and hospitals, which have only gotten worse. Health care costs have skyrocketed in the last decade, and HMO's have gained a number of rights at the expense of the rights of the patients; funding is down from where it was and is supposed to continue to decrease this year, and the fact of the matter is this; just as the airlines needed a huge bailout to maintain operations after September 11th, the health care industry and especially hospitals need an even larger bailout in order to remain effective entities during a biological attack. This includes investing into personnel, in their training and in bolstering their dwindling numbers. In addition to Henderson's report, a report from the Henry L. Stimson Center dated October 2000 echoed many of the same issues, also noting that even the simple flu overwhelmed hospitals.⁶¹ Even with the best plans and all the vaccine in the world, a shortage of personnel and a health system on the verge of collapse will greatly amplify casualties and problems in any sort of a bioterrorist attack on the United States to dreadful proportions.

⁶⁰ Executive Summary of CDC's Response Plan plus sections i-iv, 13-14

⁶¹ Smithson, *Ataxia*

Yet a final element must also be considered: in addition to being able to respond to an attack, the U.S. has put considerable effort into preventing attacks. The war on terror has made a large number of headways into preventing attacks by attacking and disrupting the personnel and finances of al-Qaeda, yet, it seems, Osama bin Laden and Mullah Omar both escaped during Battle of Tora Bora because of the Bush administration's reluctance to fully commit enough forces. In addition, a lack of long term commitment has already rendered Afghanistan a fractious and dangerous country, which may yet again become a terrorist haven because of this Administration's reluctance to commit forces to peacekeeping despite Afghan requests for such peacekeeping (or "nation building," as Bush disdainfully calls it). Yet, the greatest threat to the proliferation of WMD's, if not also their actual use, lies in Iraq and the nature of the Hussein regime, and the commitment to disarm Iraq and to enact regime change in Iraq is, in the long run, vital to U.S. National Security and will greatly reduce the threat that Iraqi weapons will end up in the hands of terrorists and be used against America. These commitments will also serve to deter less hostile regimes like Iran and North Korea and will probably make it apparent that cooperation is the only viable route for them to choose.

In another realm of prevention, the Clinton administration worked all through the 1990's to employ the technology and expertise of the old Soviet biowarfare program towards peaceful ends, through renovating facilities for peaceful use, keeping expert scientists employed, and either buying up the old weapons of many of the former Soviet Republics or, in a more recent agreement between Bush and Putin, in assisting Russia in its effort to secure and account for the weapons it still maintains. It remains to be seen if

Russia will fully disclose all relevant information concerning its WMD programs, but the sooner it does, the better off they—and we—will be; they don't want their weapons ending up with the Chechens any more than we want them with al-Qaeda, and the two have proven to be linked in the past. Still, the progress towards disarmament and accounting of WMD in the territories of the former U.S.S.R., started under the Clinton administration and continued by George W. Bush, is significant.⁶²

Thus, in addition to preparing for possible attacks, accounting for the world's WMD and seeing them in safe hands or destroyed, and seeing the expertise needed to make them employed peacefully, is vital, and not only militarily or diplomatically, but also in the field of intelligence: knowing where the weapons are and who has them or has the capabilities to produce them, is also a huge portion of the battle

IX.)DESTRUCTION VS. RETENTION

Both before and after September 11th, a debate raged on in the scientific community about the fate the world's two official repositories of the smallpox stocks in Russia and in the United States. Officially, all the rest of the world's stocks had been transferred to one of these two locations, and in no other place was more than 10% of the *variola* DNA allowed to be kept.

In late 1991, the Pentagon and the Department of Health and Human Services co-authored a memorandum which had set a goal of destroying U.S. smallpox stocks in the CDC by the end of 1993, as plans to sequence the entire virus were underway and would soon be completed,⁶³ information that was made public in 1993. The Russians were

⁶² Miller, 168-182

⁶³ Tucker, 167

engaged in similar pursuits and also planned destruction of their stocks, at least publicly. Also, four prominent scientific organizations had publicly called for the destruction of the smallpox stocks.⁶⁴

So the stage was set at the Ninth International Congress of Virology for a debate on the destruction of the smallpox stocks. Many who had worked on the Eradication wanted to see the symbolic end to their long struggle, and argued heavily for its destruction; the vaccine could handle any outbreaks, and the virus had been mapped, so the rationale was, why keep it around to haunt the world? In addition, smallpox was a virus exclusive to humans, and since it no longer existed in nature, it was now impossible for clinical studies of smallpox. The final rationale was that of the moral example, that the destruction would not allow other states to use the American and Russian harboring of the stocks as reasons for pursuing and developing their own. Said one “destructionist,” “In an ideal world, I’d argue for the preservation of smallpox for ongoing research. But we don’t live in such a place. I think this is an instance in which we need to take the moral high ground and destroy our stocks to send a very clear signal to these other countries that it’s a crime against humanity to develop such weaponry.”⁶⁵

Those wanting to retain the stocks argued that the virus may yet reemerge from smallpox victims buried in the arctic permafrost, that some clandestine stocks might exist, and that the monkeypox virus, which sometimes infect humans and was even sometimes spread from human to human in West Africa, could make a trans-species jump sometime in the future. They also argued that all potentially beneficial research could not be conducted from DNA sequences alone. There was also a philosophical debate about

⁶⁴ *Ibid.*, 169

⁶⁵ *Ibid.*, 170-171

causing something to become extinct. For them, destruction made no sense; as one official said, “Regrettably, taking the high road in this matter is unlikely to deter unsanctioned behavior; setting good examples rarely prevents criminal behavior... The symbolism of destroying the remaining stocks of smallpox virus is highly unlikely to influence anyone contemplating biological warfare or terrorism.”⁶⁶

The “retentionists” seemed to be winning, for the fall of 1993 saw a “groundswell” of support for retaining the stocks for research emerge. Still, it was far from a majority. The Russians were terrified when, not far from the dilapidated building in Moscow where their official smallpox was stored, an attempted coup erupted in severe violence in which tanks and multiple elite divisions of the Russian Army were brought in to put down the coup. The Russians became worried that they might not be able to secure their official stock. Thus it was in July of 1994 that they secretly moved their stock to the Vector, the Russian State Research of Virology and Biotechnology in Novosibirsk, Siberia, in defiance of the WHO’s regulations. The move was completed in late September, and an angry but powerless WHO was informed of the move that December. Yet Ken Alibek, the high level defector, saw this move as setting up the foundation for more biowarfare research using smallpox, and such research was already believed to have been secretly ongoing at Vector, one of the troubling sites that had been visited in 1991 by American and British inspectors.⁶⁷

Meanwhile, the deadline for destruction passed since there was such a deadlock within the WHO. The year passed uneventfully until September 9th saw a meeting of the Ad Hoc Committee on Orthopoxvirus Infections in Geneva and 8 of the 10 members,

⁶⁶ *Ibid.*, 171-173

⁶⁷ *Ibid.*, 174-177

including D. A. Henderson, voted to destroy the stocks on June 30th, 1995. That December, the U.S. Government decided to reexamine its plans, and found that all concerned agencies except for the Department of Defense were in favor of destruction. Defense was aware of the Soviet biowarfare program, but that information was still classified to the rest of the parties concerned, such as Henderson. The situation was given more attention, and questions were raised concerning such topics as genetically engineered smallpox, resistant to vaccines, and Soviet smallpox possibly having migrated to places like Iraq and North Korea; these troubled officials. In early January, Defense officials decided on their own to discuss the matter with several U.S. allies, trying to persuade them to go for retention. British defense officials agreed, but they, too, like the U.S., faced opposition from the rest of their government. Canadian and Australian officials merely said they would pass on the U.S. Department of Defense's concerns.⁶⁸

Henderson and the other destructionists were expecting a swift endorsement of the new deadline during a January 28th, 1995 meeting of the WHO Executive Board, a multinational steering committee for the World Health Assembly; but defense officials from the U.S. and the U.K. pressured various representatives to delay making any decision. Henderson was not happy at all. The debate raged on all year until eventually President Clinton was asked to make the final decision, and he decided to remain in favor of the planned destruction with the reservation that should others want to delay for sound reasons, the U.S. would go along. When Australia proposed a 3 year postponement for more research at a January 1996 WHO Executive Committee meeting, the U.S. backed the proposal and it was passed. At the end of that year, Henderson finally learned of the

⁶⁸ *Ibid.*, 177-184

Soviet biowarfare program and felt shocked and betrayed. Yet he stayed strongly pro-destruction.⁶⁹

Early 1998 saw the WHO ask all 190 member nations for their thoughts on the destruction. At the same time, Ken Alibek broke his story to the public, Clinton himself was becoming more and more worried about terrorism, especially with the revelations that the cult responsible for the Tokyo Subway Sarin Gas attack, Aum Shinrikyo, had attempted to use anthrax and botulinum in addition to Sarin. He had also read Richard Preston's 1997 fictional novel, *The Cobra Event*, in which a mad scientist engineers a virus that combines smallpox, the cold, and several rare diseases, and releases it into the New York City Subway System, causing many to die horrible deaths. Clinton had his experts set up possible bioterror scenarios, all of which were disasters. He then began a vast increase of the resources put into combatting biological and chemical threats and into preparing for possible terror attacks. The devastating 1998 al-Qaeda bombings of the U.S. Embassies in Kenya and Tanzania made his concerns even graver, and he revealed to the public that Bin Laden had tried to acquire biological and chemical weapons. Henderson, especially after the Alibek information was made available to him, shared President Clinton's concerns about bioterrorism, and Henderson was especially concerned about smallpox. For Henderson, the world was more and more vulnerable to *variola* as civil vaccination had ended in the early 80's worldwide, and the immunity from vaccinations was fading while vaccination stocks were dwindling. A well planned release of *variola* in the U.S. could be catastrophic.⁷⁰

⁶⁹ 184-189

⁷⁰ 190-196

Where others were calling for new research on smallpox drugs, Henderson called for more smallpox vaccine and for research into finding drugs to help combat *vaccinia*, the so that it could safely be administered to those with impaired immune systems, like those who are HIV positive. He still wanted to get rid of the pox, and didn't feel research with smallpox was the way.⁷¹

Clinton wanted to know more though, so he authorized a study from the Institute of Medicine as to what research with live *variola* could potentially yield. They concluded that *variola* could yield a potential "Rosetta Stone" of tools to combat viruses. The next month, in December of 1998, the CIA reported secretly to senior officials that there was evidence to believe that Russia, Iraq, and North Korea had clandestine stocks of smallpox they were retaining for bioweapons research. This was leaked to *The New York Times* 6 months later. Clinton would rely on the upcoming report from the Institute of Medicine. Thus it was in March, 1999, that the Institute of Medicine released a report saying that live virus would be needed to research new kinds of vaccines, and recommended looking into such vaccines since the current one was a live virus and could not be taken by a large number of people with immune system deficiencies.⁷²

The Department of Defense had what they wanted, but Henderson talked of the report being biased. This report evidently swayed Clinton, who had previously been in the destructionists' camp, into the retentionists' camp. As more and more people saw the threat that smallpox posed and realized that the current vaccine, with its problems and its 40-50 million Americans it would leave behind, was not wholly sufficient, the destructionists began fighting an uphill battle. For Henderson, he had worked his whole

⁷¹ 198-199

⁷²*Ibid.*, 200-210

life to destroy something that now these people wanted to save. In addition, he noted how new vaccines would require an animal model, since humans could obviously not be test subjects with smallpox, and this, to his knowledge and the medical community's knowledge, was not possible, as smallpox was exclusive to humans. Peter Jarhling at USAMRIID had been involved in this struggle as well, but as one of the people wanting to do research. When the May meeting of the WHO's World Health Assembly decided to postpone the destruction again for another 3 years, till June 30th, 2002, Jarhling saw it as a three year window for himself and his staff at USAMRIID to come up with a way to provide a model for smallpox research. He would have to find a way to infect an animal.⁷³

X.)EXPERIMENTS

Actually, due to FDA regulations that any drug for human use needed to be successfully tested on two different species of animals, he would have to infect more than one. Jarhling obtained permission from the CDC to conduct experiments to try and infect macaw monkeys with smallpox. A May, 2000 attempt to infect the monkeys, each one having breathed in over 10 million particles of smallpox, failed. Yet Jarhling's subsequent September of 2000 visit to France where the IL-4 mousepox experiment was displayed made the need to find an animal host for *variola* even more imperative in his mind. He finally obtained permission from the CDC to try again in March of 2001. The experiment started on the last day of May, 2001. Four monkeys breathed in 100 million particles of a strong smallpox strain, and had 1 billion particles injected into their

⁷³ Preston, 108

bloodstream. The next day four more were infected with a strain thought to be similar to Russia's India-1 in the same manner. In a matter of a few days, 7 of the 8 monkeys died from smallpox, with one survivor who had still contracted and suffered through the disease. They had done it. Granted, they infected the monkeys with ridiculously unrealistic amounts of smallpox, and the monkeys' bloodstreams were injected with smallpox, not the natural method of transmission, but they had done it. The experiment was a resounding success, and D. A. Henderson was not happy. They were conducting other experiments with monkeys and smallpox in September, when one day, they had to drop what they were doing, hurry through decontamination, and run out of the building. As September 11th, 2001 unfolded, no one knew what the next target was going to be. They had been working with massive amounts of live smallpox, and if a plane had crashed into the CDC, it could have started a major epidemic which, with the country in panic from the attacks in New York and Washington, would have been a disaster of the grandest scale that would have made the less than 3,000 victims of that day seem a small number in comparison.⁷⁴

XI.) CONCLUSION: 9/11 AND THE FATE OF THE STOCKS

Henderson, meanwhile, found himself very busy as the director of Health and Human Service's new Office of Public Health Emergency Preparedness & Response, dealing with the anthrax attacks of that fall. October, 2001, saw Bush's team unanimously support retention for research. They were preparing for an assault using information to convince the WHO Executive Board to retain the stocks. September 11th had convinced the Bush team of the need for retention, but, for Henderson, it was even

⁷⁴ *Ibid.*, 124-126, and 131, and 142-160

more of a reason to destroy them. Yet he knew he had lost, and decided not to even attend the WHO meeting. A smaller body, the WHO Advisory Committee on Variola Research, met in Geneva from December 3rd-4th. They decided that the set destruction date did not give researchers enough time, and decided to extend it with the still eventual goal of destruction. Yet at this time, some new opposition to retention was emerging as some nations began to doubt the two repository nations' intentions. The January meeting of the WHO Executive Committee decided that postponement would be the agenda of the upcoming WHO General Assembly. During the May Assembly it was decided to postpone the destruction yet again, though this time, the only date set was a 2005 progress report. Still, once the specific goal of developing new drugs that could more safely treat as many people as possible if not all people was met, the WHO made clear it still intended to destroy the official stocks of the virus.⁷⁵

Personally, one can never know how something may or may not be needed in the future. In an ideal world, where one could trust people to destroy their stocks of smallpox, destruction makes sense. Yet we live in the world of suicide bombers and September 11th, and in such a world, destruction is not a viable option when it may be the only tool to develop a defense for a yet unknown or unmade strain of genetically modified smallpox. If Bush gets reelected, you can expect him to snub any order to destroy the smallpox stocks, and this would be one of his few wise snubs of international pressure. How tragic that a disease which was so terrible that it brought the world together to destroy it must now be kept in existence because humans, not *variola*, are the problem.

⁷⁵ Tucker, 257-271

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