

THE
PANIC
VIRUS

*A True Story of Medicine,
Science, and Fear*



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CHAPTER 1

THE SPOTTED PIMPLE OF DEATH

To understand the roots of modern-day fears of vaccines, it is necessary to understand vaccines themselves, and to do that requires us to look back briefly at the deadly diseases they protect against. The most consequential of these is smallpox. In the three thousand years since the first recorded smallpox epidemic in 1350 B.C., no virus has affected humanity more profoundly than *Variola vera*—a term that comes from the Latin for “spotted pimple.” (The term “smallpox” was coined in the fifteenth century in an effort to distinguish *Variola* from syphilis, which was known as “the great pox.”) Smallpox’s telltale scars mark the mummified face of Ramses V, an Egyptian pharaoh who died in 1157 B.C. The Plague of Antonine, with a death toll of between three and a half and seven million, hastened the decline of the Roman Empire. The collapse of the Aztec and Incan kingdoms was expedited by the introduction of smallpox by Old World conquistadors. In eighteenth-century Europe, 400,000 people a year died from smallpox, and those who survived accounted for a third of all cases of blindness on the continent. Between 1694 and 1774, eight reigning sovereigns—Queen Mary II of England, King Nagassi of Ethiopia, Emperor Higashiyama of Japan, Emperor Joseph I of Austria, King Louis I of Spain, Czar Peter II of Russia, Queen Ulrika Eleanora of Sweden, and King Louis XV of France—died of the disease; the Habsburg line of succession changed four times in four generations because of smallpox deaths.

The virulence of smallpox brought about the first attempts at inoculation, which medical historians estimate occurred more than two thousand years ago in the Far East, although the earliest known records are from eighth-century India. In either case, it wasn’t until the eighteenth century that the practice spread to the West: In 1717, Lady Mary Wortley Montagu, the wife of the British ambassador to the Ottoman Empire, was amazed to discover that “the small-pox, so fatal, and so general amongst us is here entirely harmless, by the invention of *ingrafting*”—a crude and painful process by which pus from an individual with a relatively mild case of the disease was spread on an open wound of an as yet uninfected person. Contrary to Montagu’s enthusiastic claim, however, inoculation—which was also known as variolation, in honor of the disease it sought to combat—did *not* render smallpox entirely harmless: Inoculees still got sick; that, after all, was the whole point of undergoing the procedure in the first

place, since a bout of smallpox was the only known way to achieve lifelong immunity. What's more, even though an inoculation-induced case of the disease was usually less severe than one resulting from a natural infection, there were still those who became alarmingly ill and even died. Montagu, who'd lost a brother to smallpox, clearly considered those risks worth taking, and she successfully inoculated her five-year-old son while still in Constantinople and her four-year-old daughter shortly after arriving home. In London, her doctor was given permission to test the procedure on a half-dozen prisoners who'd been condemned to hang. All six survived—and were eventually granted their freedom. (Authorities in Georgian-era England might not have been overly concerned with prisoners' rights, but they apparently did have a sense of fair play.) Within a year, the Prince of Wales, mindful of the fate that had befallen so many of his royal contemporaries, had inoculated his own daughters.

In New England, the Puritans were also learning about inoculation, but their acceptance of the procedure was slower. In 1706, a "Coromantee" slave of Cotton Mather's named Onesimus described for the minister being inoculated as a child in Africa. In the following years, Mather told friends about his slave, who "had undergone an Operation, which had given him something of y^e *Small-Pox*, & would forever praeserve him from it." Mather, whose wife and three youngest children had died of measles, soon became a passionate advocate of the procedure; still, it wasn't until 1721, in the midst of an epidemic in which eight hundred Bostonians died and half the city became ill, that he was able to persuade a local doctor named Zabdiel Boylston to inoculate a pair of slaves, along with Mather's and Boylston's young sons. After a brief period of illness, all recovered.

Mather, a Puritan minister best known for his involvement in the Salem Witch Trials several decades earlier, began preaching to anyone who would listen that inoculation was a gift from God. This view, he quickly discovered, was not a popular one: Not long after he and Boylston publicly announced their results, Mather's house was firebombed. An accompanying warning read, "COTTON MATHER, You Dog, Dam you. I'l inoculate you with this, with a Pox to you." Some of the procedure's most vocal opponents feared that inoculation would spread smallpox rather than guard against it. Others cited biblical passages—especially apropos was Job 2:7, which read, "So went Satan forth from the presence of the Lord and smote Job with boils, from the sole of his foot, unto his crown"—as proof that smallpox was a form of a divine judgment that should not be second-guessed or interfered with. (It was for this reason that gruesome vaccination scars came to be known as the "mark of the beast.")

The tendency of our forefathers to view smallpox as an otherworldly affliction

is easy to understand: It is one of the world's all-time nastiest diseases. After a dormant period in the first several weeks following infection, the virus erupts into action, causing bouts of severe anxiety, lacerating headaches and backaches, and crippling nausea. Within days, small rashes begin to cover the hands, feet, face, neck, and back. For an unlucky minority, those rashes lead to internal hemorrhaging that causes victims to bleed out from their eyes, ears, nose, and gums.

Most of the time, however, the progression of the disease is not so swift. Over a period of about a week, the initial rashes transform first into pimples and then into small, balloonlike sacs, which render some of the afflicted all but unrecognizable. Three weeks after infection, the vesicles begin to fill with oozing pus. Several days later, after these increasingly foul boils are stretched to capacity, they burst. The resulting stench can be overpowering: One eighteenth-century account described "pox that were so rotten and poisonous that the flesh fell off . . . in pieces full of evil-smelling beasties." Throughout the 1700s, between 25 and 30 percent of all smallpox victims died. Even those survivors who were not permanently blinded did not escape unscathed, as the vast majority of them were left with scars across their cheeks and noses.

The fact that for many people the threat of being afflicted with smallpox was not enough to overcome an innate resistance to having infected pus smeared on an open wound can likely be attributed in part to a phenomenon called the "disgust response." In a 2001 paper, sociologists Valerie Curtis and Adam Biran speculated about a possible evolutionary explanation for what the cognitive scientist Steven Pinker has called human beings' "intuitive microbiology": "Bodily secretions such as feces, phlegm, saliva, and sexual fluids, as well as blood, wounds, suppuration, deformity, and dead bodies, are all potential sources of infection that our ancestors are likely to have encountered," Curtis and Biran wrote. "Any tendency towards practices that prevented contact with, or incorporation of, parasites and pathogens would have carried an advantage for our ancestors."⁶ Looked at from this perspective, it's a testament to smallpox's sheer hellishness that anyone willingly underwent the crude vaccination efforts of the early eighteenth century.

There were, to be sure, other explanations for opposition to inoculation, including the colonists' hair-trigger resistance to anything that was perceived as infringing upon individual liberties. Even the smallpox epidemic that engulfed Boston in 1752, in which 7,669 of the city's 15,684 residents were infected, did not sway the procedure's most fervent opponents. In the years to come, these reactions would, at least for a brief while, become secondary to the fear of losing the struggle that defined America's very existence: the Revolutionary War.

On September 28, 1751, nineteen-year-old George Washington and his half-brother, Lawrence, left the family plantation at Mount Vernon for Barbados. This was no vacation: Lawrence hoped the West Indian island's warmer climate would help cure his tuberculosis. The day after completing their five-week trip, George and Lawrence were persuaded to go to dinner with a local slave trader. "We went," Washington wrote, "myself with some reluctance, as the smallpox was in his family." As Elizabeth Fenn recounts in *Pox Americana*, her history of smallpox outbreaks during the American Revolution, Washington's concern was justified: Exactly two weeks after that dinner he wrote in his diary that he had been "strongly attacked with the small Pox." Washington, overcome with the anguish of the disease, would not make another journal entry for close to a month.

Twenty-four years later, with Washington newly installed as commander in chief of the Continental Army, the colonies were struck with the deadliest smallpox epidemic in their brief history. In Boston, the death toll reached five per day, then ten, then fifteen; by the time it was at thirty, the city's churches no longer even bothered to ring their funeral bells. It was in the midst of this environment that Washington mounted an ill-conceived wintertime attack on the British forces that were holed up in the walled city of Quebec. Throughout December, ragtag American battalions and straggling troops marched to Canada from as far south as Virginia. Some reached the American encampment already infected with smallpox; others, weakened by their travels, found themselves thrust into a prime breeding ground for the virus. Many of the new conscripts had ignored recommendations that they get inoculated before reporting for duty; once ill, they regularly disregarded procedures for alerting commanding officers about their infections.

As 1775 drew to an end, Benedict Arnold, then the leader of the northern forces, warned Washington that any further spread of smallpox could lead to the "entire ruin of the Army." Since the disease was endemic in Europe, many British soldiers had been infected when they were boys—an age when survival rates were relatively high—and were now, like Washington, immune, which allowed them to occupy smallpox-stricken towns and fight against smallpox-infected regiments without fear of falling ill.

The Americans had no such luxury. By Christmas Day, roughly a third of the troops massed outside Quebec had fallen ill. Still, the Continental forces stuck to their plan, and launched an assault on New Year's Eve. The American and Canadian coalition maintained its largely ineffectual siege until May, when newly arriving British troops forced an embarrassing retreat. It was the first battlefield defeat in America's history.

Determined not to repeat the mistakes of Quebec, Washington spent much of 1776 torn about whether to require variolation for new conscripts. It was a torturous decision: On the one hand, inoculation would protect his soldiers and dampen what was rapidly becoming a full-fledged, smallpox-induced fear of enlistment. On the other, it would mean that significant numbers of American troops would be out of commission for weeks on end. More than once in 1776, Washington issued decrees requiring inoculation, only to change his mind days later.

In the end, repeated rumors of Tory biowarfare tipped the balance. “It seems,” Josiah Bartlett told a fellow congressional delegate in early 1777, that the British plan was “this Spring to spread the small pox through the country.”⁷ That February, Washington ordered his commanders to “inoculate your men as fast as they are enlisted.” “I need not mention the necessity of as much secrecy as the nature of the Subject will admit of,” he wrote, “it being beyond doubt that the Enemy will avail themselves of the event as far as they can.” Washington’s plan did remain secret—and from that point forward, American soldiers could focus their energies on defeating the British instead of on maintaining their health.

6 As part of their research, Curtis and Biran tried to identify universal objects of disgust. While there were some notable differences—in India, people were sickened by the thought of food cooked by menstruating women, while in the United Kingdom, subjects were repulsed by cruelty to horses—everyone listed bodily fluids and decaying or spoiled food near the top of their lists. Curtis and Biran also discovered a near-universal physical reaction that accompanies disgust: moving back the head, wrinkling the eyes and nose, and turning down of the mouth. Don't believe them? Imagine being trapped in an overflowing outhouse.

7 These were not paranoid fears: In 1763, the commander of the British forces in North America recommended giving rebellious Native Americans blankets that had been sprinkled with ground-up smallpox-infected scabs.