

Bound Together

How Traders, Preachers, Adventurers, and Warriors Shaped Globalization

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Chapter 7 Slaves, Germs, and Trojan Horses

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INVISIBLE DANGER FROM AFAR

On the early morning of 12 October 1492, strange-looking floating houses with masts appeared off an island in the Caribbean. Wide-eyed and naked natives gathered to watch. The pale, bearded sailors who emerged from the Santa Maria, Nina, and Pinta spoke an unknown tongue and wore strange coverings, but they seemed genuinely overjoyed to have found the rocky bay. That encounter between Europeans and American Indians reunited two human communities that had gone their separate ways on leaving Africa more than fifty thousand years earlier.

Neither the relieved Christopher Columbus and his sailors nor the curious natives could imagine what portent this encounter held for the future. Along with the unwashed and unshaven strangers in funny dress came invisible viruses and pathogens that would wreak havoc on the New World population. AB Alfred W. Crosby, Jr., writes in his seminal book *The Columbian Exchange*: "When the isolation of the New World was broken, when Columbus brought the two halves of the planet together, the American Indian met for the first time his most hideous enemy; not the white man nor his black servant, but the invisible killers which these men brought in their blood and breath."⁵⁹

Within a span of just seventy-odd years, eighty to a hundred million natives perished because of the disease brought by Europeans from across the seas: smallpox, influenza, diphtheria. "Like the rats of the medieval Black Death," Niall Ferguson comments, "the white men were the carriers of the fatal germ."⁶⁰ One of the things English pilgrims gave thanks for at Plymouth in 1621 was the fact that 90 percent of the indigenous peoples of New England had died of disease brought by previous visitors, having first-very considerably-tilled the land and buried stores of corn for the winter. As the governor of Carolina John Archdale stated in the 1690s, "The Hand of God [has been] eminently seen in thinning the Indians, to make room for the English."⁶¹

The decimation of the American Indians was, however, just one episode in the long history of death and suffering that has accompanied human intercourse across the world. Along with humans, insects, cattle, and domesticated animals—all carrying viruses and pathogens—crossed borders and found new hosts. The global dissemination of disease was thus one of the earliest negative consequences of interconnectedness. It is not, however, the fact of human

travel that lies behind the globalization of disease; early hunter-gatherers, who constantly moved around in search of food, appear to have been healthy. Because of their nomadic way of life, they did not live amid their waste, nor did they tend cattle or poultry. It was the rise of sedentary, agriculture-based communities that brought cattle, poultry, rodents, and insects living cheek by jowl with humans, providing vectors for the transmission of germs. As caravans and boats of traders began connecting dispersed human communities, they began inadvertently transporting, along with their goods, new pathogens: germs and germ-bearing rodents, mosquitoes, and fleas. Traded commodities like slaves carried communicable diseases that changed the recipient countries. Soldiers on expeditions carried germs to new lands and returned with new pathogens and infections ranging from the plague to influenza. With the advent of mass travel, even latter-day adventurers-tourists-have become vectors of pandemics. Thus at least three of the four agents of globalization-traders, warriors, and adventurers-were unwitting carriers of catastrophes.

Roman soldiers returning from the Parthian Wars in Mesopotamia in the second century brought with them the first documented case of an epidemic hitting the Mediterranean world of the Roman Empire. There is some debate whether it was a rat-borne plague or the first case of smallpox, but either way a terrible epidemic killed between a third and a half of those infected and triggered a decline in the Mediterranean population. The year 542 brought the first unmistakable case of bubonic plague, in which a rat-borne bacillus, *Y. pestis*, caused the swelling of lymph nodes into buboes and a fatal secondary lung infection. Called Justinian plague after the Roman emperor, the epidemic is believed to have originated in India and was brought to Egypt by rats adept in scurrying across the fastening lines that tied Arab trading ships to ports along the Red Sea. Colonies of fast-breeding rats and the fleas that fed on them spread the pestilence along the Mediterranean trade routes, all the way from Constantinople on the Bosphorus to the Iberian Peninsula. The historian Procopius reported that at its peak, the plague killed ten thousand persons a day in Constantinople alone. Between 30 to 40 percent of the Roman Empire's population-estimated at sixteen to twenty-six million before the plague-perished in the pandemic.⁶² A contemporary account put the loss graphically. The plague "depopulated towns, turned the country into desert and made the habitations of men to become the haunts of wild beasts."⁶³

It is estimated that at least a quarter of the population in both the eastern and western halves of the Roman Empire perished. It was a record that was surpassed six centuries later by another plague pandemic, which came to be known as the Black Death (so named because of a mistranslation of the Latin expression *atra mors* as "black" -rather than "terrible" -death). Commonly the appellation is attributed to the discoloration of the skin and black buboes that occur on the second day after contracting the plague.⁶⁴

HIGHWAY OF DEATH

In 1347 Italian merchant ships from the Crimean Black Sea port of Kaffa (today's

Theodosia) arrived in Constantinople and in seaports along the coasts of the Mediterranean, bringing with them the plague bacillus. The plague then spread throughout Asia Minor, the Middle East, North Africa, and Europe. Traders crossing the rodent-infested Central Asian steppes offered themselves as unwilling carriers of the disease. As we have seen, the ancient Silk Road flourished under the Mongols' protection, but although the route was safe from bandits, it was not immune from germs passed to traders by rodents and fleas. The Black Death, believed to have originated in China in an outbreak in 1331, reached the Crimea in 1345. By 1347 the plague had reached Constantinople, and soon Pisa and Genoa. Once the pestilence had reached the major ports in Europe it proceeded along overland routes to major cities, felling one after the other. The famous trading route that had once brought prosperity to European cities was transformed into a highway of death that traveled in the shape of furry black rats.

Historian Ole Benedictow concludes that about 60 percent of the population, or some fifty million of Europe's estimated eighty million, perished from the plague and related ailments. 65 Contemporary accounts describe mounds of rotting corpses that could not be collected, much less buried. In a city like Florence, with a population of one hundred thousand, some four hundred to a thousand people died every day. From 1347 until 1722 the plague returned to Europe periodically before dying out. For a period, trade almost came to a halt. If the word globalization had been known, one would have pronounced it dead as well. Europe's falling population, however, set in motion economic and social trends and medical practices that proved a turning point in world history. The devastation that followed helps to underline the interconnected nature of the world that trade had already created. The death of half or more of the population meant a sharp rise in the per capita wealth among the survivors. Newly wealthy from inheriting land, capital, and stocks of gold and silver, and exhilarated to be alive, Europeans went on a luxury buying binge that enriched Asian suppliers of silk and spices and Arab and Venetian intermediaries. Their shopping spree also caused what one historian has called the "Great Bullion Famine of the Fifteenth Century." This drastic shortage of coins led to an intensified search for precious metals, and in 1516 "one of the greatest silver strikes in history" was made in the German town of Joachimsthal. The coins produced by the town's mint were called Joachimsthaler. And the thaler, as it was later shortened, was the precursor to our word dollar. 66 But meanwhile, as we have seen, the stranglehold of Venetian-Arab intermediaries on the spice trade led Europeans to intensify their search for alternate sea routes to Asia. 67 By promoting the demand growth in Europe, the Black Death in many ways foreshadowed another spurt toward formation of a consumer society that would arise from the New World's supply boom.

More immediately, the labor shortage and its high cost led to a more rational work organization, efficient production methods, and labor-saving devices. Water-powered sawmills that had been developed in the early thirteenth century

came into widespread use. The death of a large number of scribes sent the price of copying manuscripts skyrocketing, pushing the need for some form of automated copying. Paper-making, learned from the Chinese, had already led to the production of cheap paper. Moveable type made of wood also was known. In 1447 Johannes Gutenberg of Mainz, Germany, combined his skill in metallurgy with printing technology to produce Europe's first moveable metaltype printing press and launched a revolution.⁶⁸ The production of cheap consumer goods in Britain and Holland shifted the center of economic gravity from the Mediterranean to the North-which would eventually pioneer modern shipbuilding and usher in the Industrial Revolution.

A catastrophe of such magnitude as the Black Death also revealed and drove long-held prejudices against "outsiders" like Jews to a new height. The theory that Jews and other "enemies of Christendom" caused these deaths by poisoning wells and other sources of drinking water led to a violent persecution of minorities in many parts of Europe. It was "a sort of medieval holocaust with extensive and indiscriminate murder of Jews, [hastening their] movement to Eastern Europe, where their descendants were, to a large extent, annihilated in a new, and even more violent holocaust 600 years later."⁶⁹

THE BIRTH OF QUARANTINE

The Black Death had far-reaching consequences on public health policy. The first known order to quarantine passengers was issued on 27 July 1377 by the Venetian colony of Ragusa (now Dubrovnik in Croatia) on the Dalmatian coast. The order for a thirty-day period of isolation for those coming from plague-stricken areas was later extended to forty days-hence the term quarantine, developed from Italian *quarantena*. "Thus stirred by the Black Death in the middle of the fourteenth century," writes George Rosen, "public officials in Italy, southern France, and the neighboring area created a system of sanitary control to combat contagious diseases, with observation stations, isolation hospitals, and disinfection procedures. This system was adopted and developed during the Renaissance and later periods and is still a part of public health practices today, although in a more rigorously defined form."⁷⁰

But the quarantine system did not always work. In the spring of 1720 a Levantine boat carrying cases of human plague appeared in the port of Livorno. It was turned away there and at Marseille. But after a few months of wandering in the Mediterranean, including a stop at Tripoli, the boat returned to the French port of Toulon, where many passengers managed to bribe their way out of a token quarantine. Soon plague flared in Toulon and spread to Marseille, killing nearly half of its hundred thousand residents.⁷¹ The disaster at Marseille led to stricter enforcement of quarantine and an effort to limit or eliminate the Middle Eastern cloth trade. The effort fitted well with the rising sea-borne textile trade between India and Europe.

As noted earlier, one of the greatest ravages of globalization-in the sense of the closer integration of human communities-was the transmission of diseases to American Indians in the New World, who had no immunity against

the pathogens brought from Europe. In 1519 the Spanish conquistador Hernan Cortes succeeded in defeating the more numerous Aztecs with a small army because they were enfeebled by smallpox spread from an African slave accompanying Cortes. The Aztecs interpreted the selective pestilence as a demonstration of the superior power of the god the Spanish worshipped, says historian William McNeill. As a result, Cortes and his ragtag army were able easily to subjugate the Aztec empire of some twelve and a half million. From Mexico, smallpox spread to Guatemala and continued southward, reaching the Incan lands in present-day Peru around 1525. In 1563, Portuguese colonizers brought smallpox to Brazil, where it wiped out entire indigenous tribes.⁷² Further north, there were probably about two million indigenous people in the territory of the modern United States in 1500. That number had fallen to 750,000 in 1700 before being further reduced to 325,000 by 1820.⁷³

As the slave trade and conquest transmitted smallpox to new lands, its remedy also was passed on from one country to another. The practice of smallpox inoculation known as "buying the smallpox" or "variolation" is believed to have begun in India before 1000 BCE. It was spread to Tibet and then to China by monks at a Buddhist monastery in Sichuan province around the year 1000.⁷⁴ During the mid-seventeenth-century, merchant caravans brought the knowledge of variolation to Arabia, Persia, and North Africa, and it came to be practiced at the folk level throughout the Ottoman Empire. In the early eighteenth century Lady Mary Montagu, wife of the British ambassador to Constantinople and herself a survivor of smallpox, variolated her son and introduced the practice to Britain.⁷⁵

Dr. Edward Jenner developed the technique of vaccination by inoculating people with pus from cowpox victims, which prevented the more serious smallpox infection. In his book describing the procedure in 1798, he coined the word *vaccine*, from the Latin word *vacca* for cow and named the process "vaccination." In 1881 the French microbiologist Louis Pasteur honored Jenner by expanding the use of the term *vaccination* to describe any inoculation that induced immunity against a communicable disease. More than any single medical invention, vaccination has since saved hundreds of millions of lives and transformed the world's demography. As J. N. Hays has noted: "One by one the perils of various infectious epidemic diseases seemed to fade away under the combined assault of enlightened public health and sanitation, the extension of the preventive principle of vaccination, and the curative powers of laboratory products, among which the antibiotics created the greatest sensation."⁷⁶

Noted flu virologist Kennedy Shortridge believes that all flu pandemics that can be traced have always begun in China's Guangdong province, a densely populated region where people, pigs, ducks, and other fowl have long lived cheek by jowl. The Spanish flu of 1918 may also have begun as bird flu in Canton in 1888. During World War I, Chinese laborers traveled to camps in France to dig trenches for the Allies and may have carried the virus strain that set off the flu pandemic. Although the suspicion that the Spanish flu is a form of avian flu has now been confirmed by DNA analysis of the victims' remains, other specialists challenge the theory of its Chinese origin

SOLDIERS, STEAMBOATS, AND SPANISH FLU

Wherever the 1918 Flu Pandemic (or Spanish flu) originated, within a year of its emergence in Europe it had infected a fifth of the world's population, including 28 percent of the U.S. population. The estimated total of victims ranges from twenty million to forty million.⁷⁸ It was called Spanish flu because, as a non-aligned country during World War I, Spain did not censor news reports, and the spread of flu there became well known in the world.

In her book *Flu*, about the 1918 pandemic, Gina Kolata vividly describes its reach: The plague took off in September of that year, and when it was over, half a million Americans would be dead. The illness spread to the most remote parts of the globe. Some Eskimo villages were decimated, nearly eliminated from the face of the earth. Twenty percent of Western Samoans perished.... It came when the world was weary of war. It swept the globe in months, ending when the war did. It went away as mysteriously as it appeared. And when it was over, humanity had been struck by a disease that killed more people in a few months' time than any other illness in the history of the world.⁹⁷

The 1918 flu was also the first truly global disease that spread as fast as the steamships and steam railways would carry people to the farthest corners of the world. Thousands of demobilized soldiers, who survived the most brutal war to date, returned home carrying the deadly infection that killed both them and their joyous family and friends. As most of the continents were by then connected by ocean liners and vast areas covered by railway networks, the flu spread out in every direction. Unlike the plague, which took three years to devastate populations from Central Asia to Europe, this flu did its damage across the world in a year and half.

Another pandemic caused by an avian flu virus, known as an H2N2 strain, which had killed between one and four million people worldwide in 1957-58, threatened to rear its head again in early 2005. This time the threat was posed not by the emergence of a newly mutated strain but by the accidental worldwide distribution of that old strain. In late 2004 a private company, Meridian Bio-science, Inc., of Cincinnati, sent a parcel of virus samples to nearly four thousand laboratories and doctors' offices for testing as part of routine quality-control certification conducted by the College of American Pathologists. Unwittingly the samples included the H2N2 virus, against which people today have no immunity. On discovery of the mistake six months later, an alarmed World Health Organization sent out an urgent advisory to destroy the dangerous samples.⁸⁰

When the next flu pandemic SARS (severe acute respiratory syndrome) arose in 2003, it spread from southern China to South Africa and to Australia and Brazil in just six months. SARS originated in China's southern Guangdong province, where some diners enjoyed a meal of wild civet and along with their dinner ingested a newly mutated **Corona** virus (the cause of the common cold) against which humans had no immunity. One of the Chinese diners, bearing the highly contagious disease, went to Hong Kong and stayed in a hotel. One of the world's major tourist and business hubs was soon

transformed into a giant disseminator of the world's most infectious disease. Less than a month after SARS claimed its first victim in Vietnam, the WHO issued a worldwide travel advisory. With its flight information board silently flashing CANCELLED, Hong Kong's cavernous Chek Lap Kok Airport looked desolate. Schools and businesses closed as frightened citizens in facemasks wondered if it was their turn. In a bid to prevent the spread of SARS, Beijing sealed off three hospitals and ordered nearly eight thousand people who might have been exposed to stay home. The Chinese capital's public schools, movie theaters, and discos were shut down. In Singapore wet markets were closed and hospital visits blocked. The most stringent quarantine procedures were set up at many of the world's ports and airports, and scientists in thirteen labs in ten countries raced to identify the new killer in search of an antidote.

Compared to the 2.5 percent morbidity rate of the Spanish flu, SARS was four times more virulent, killing 10 percent of its victims. Globally coordinated quarantine and preventive measures contained the virus, but only after it had caused 813 deaths in thirty countries, the vast majority in Hong Kong and mainland China.⁸¹ Had the WHO not issued its travel warning, and if not for the advances in science and medical surveillance and the extraordinary worldwide cooperation of scientists to identify the virus, SARS could have spread much further and faster than even the pandemic of 1918 did. Had the virus infected just 20 percent of China's population of 1.2 billion people, as many as 102 million would have died. Compared to the insignificant number of international travelers in 1918, by 2003 some 1.6 billion passengers took airplane flights and a third of these crossed international borders, taking all manner of viruses with them on their journeys. In a race against the fast-spreading virus, scientists working in networked labs from Atlanta to Vancouver to Singapore stepped up their efforts to map the virus's genome, achieving this extraordinary feat within just one month. Thus, globalization not only gave viruses jet speed, but it accelerated the pace of countermeasures as well.

DISEASE WITHOUT BORDERS

At its annual meeting in May 2003, the WHO asserted that SARS is "the first severe infectious disease to emerge in the twenty-first century" and "poses a serious threat to global health security, the livelihood of populations, the functioning of health systems, and the stability and growth of economies." Crossing international borders on jet airplanes and challenging the global health system, the SARS virus has been called "the first post-Westphalian pathogen."⁸² The Treaty of Westphalia of 1648 marked the formal emergence of an international order based on sovereign rights within fixed borders and included public health measures. Although the great powers in Europe began international legal rules and diplomatic processes to facilitate cooperation on infectious diseases in 1851, international cooperation did not intrude much on state sovereignty. But with its advisories against visiting certain countries and its aggressive inspection

regime, the WHO created a new phenomenon: the first-ever globalized response to a global disease. Even a go-it-alone President George W. Bush admitted the need for international cooperation and transparency. The lesson of the SARS experience is dear, he said: "We all have a common interest in working together to stop outbreaks of deadly new viruses-so we can save the lives of people on both sides of the Pacific."⁸³

The worry that another post-Westphalian virus-that would spread like wildfire across international borders-may be brewing in the genome cauldron makes scientists worry because they now know that the deadly flu of 1918 was in its origin an avian flu.⁸⁴ In 1997, another flu crossed the species barrier in southern China, after a boy became infected by a flu common among chickens and ducks and eventually died. Since then, the so-called jumping strain of avian flu has spread beyond Hong Kong and southern China to infect chicken and bird populations in Cambodia, Indonesia, Thailand, Vietnam, Malaysia, Korea, and Japan and, by the end of 2006, has infected ninety-three humans, of whom forty-two have died. The extraordinarily high morbidity rate of this avian flu-75 percent of those who caught the virus died (compared to less than 1 percent death in common human flu)-makes health officials shudder at the prospect of the avian flu's adapting itself for human-to-human transmission.⁸⁵ If SARS is any indicator, a transmuted virus of that type could spread across the world at the speed of a commercial jetliner and bring a catastrophe that would make the forty million flu deaths of 1918 look like a minor episode of early globalization.

The fact is that flu viruses mutate so fast that an antidote for one variety may be useless for another. In collaboration with the WHO's Global Influenza Program, scientists in some 120 laboratories around the world have been constantly peering through their electron microscopes at new samples to detect any transmutation that could indicate that the flu has gained the ability to transmit among humans. Once convinced of the threat, the WHO can issue a travel advisory that could ground thousands of passenger planes crisscrossing the world's skies and quarantine entire cities or countries. This is a capability that did not exist when Black Death or Spanish flu ravaged the planet.

There is, however, no such international system of protection against another type of danger that lurks in the cyberspace.