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CHAPTER 1

Introduction

Imagine that a time machine could carry you back to the year 900 and land you anywhere on earth for an extended stay. Where would you go live?

As you consider the possibilities, you might want a bit of useful advice—namely, avoid western Europe at all costs.¹ Why reside there, when it was poor, violent, politically chaotic, and by almost any yardstick, hopelessly backward? There were no cities, apart from Córdoba, but it was part of the Muslim world. Luxuries (silks, perfume, and spices, which flavored an otherwise bland cuisine and served as the health food of the day) were scarce and extremely expensive. To get them, you had to trade with Middle Eastern merchants and sell the few western goods they deigned to purchase, such as furs or slaves. And if you were not careful—if, say, you wandered down to the beach in Italy—you yourself might be captured and delivered into slavery.

Choosing Europe would, in short, be like opting to move to Afghanistan today. You would be far better off picking the Muslim Middle East, for back in 900 it was richer and more advanced, culturally and technologically, and would be a much more inviting destination. It had cities; markets brimming with goods from around the world, from Indian sandalwood to Chinese ceramics; and scholars who were extending works of ancient Greek science that were still unknown in western Europe.² Or instead of the Middle East, you could opt for southern China, where political regimes

1 By western Europe, I mean Austria, the Czech Republic, Germany, Italy, Scandinavia, and European countries to their west. Eastern Europe means the rest of the continent, including European parts of Russia and Turkey.

2 Swerdlow 1993; Lewis 2001, 8, 61–68, 91, 138–139, 185–187, 221–223; McCormick 2001, 584–587, 700–796, 845; Lewis 2002, 6–7; Kennedy 2004, 599.



FIGURE 1.1. In dark gray: areas never under European control, 1914. In light gray: territory Europeans controlled or had conquered by 1914, including colonies that had gained independence. Adapted from Fieldhouse 1973, map 9.

would soon stabilize after a period of turmoil, allowing agriculture to advance and trade in tea, silk, and porcelain to flourish. Western Europeans, by contrast, had nothing that promising on the horizon—only continued raids by marauding Vikings.³

Now let your time machine whisk you forward to 1914. How startled you would be to discover that the once pitiful Europeans had taken over the world. Their influence would be everywhere, no matter where you stop. Somehow, they had gained control of 84 percent of the globe and they ruled colonies on every other inhabited continent (figure 1.1).⁴ While

3 Coupland 1995; Lamouroux 1995; Clark 2009; Smith 2009; Morris 2013, 144–165.

4 Areas under European control here include Europe itself, former colonies in the Americas, and the Russian Empire, but not the non-European parts of the Ottoman Empire. The 84 percent figure comes from Headrick 1981, 3, who cites Fieldhouse 1973, 3. Because Fieldhouse provided no source for his estimate that 84.4 percent “of the world’s land surface” was under “European control as colonies or as one-time colonies,” I repeated his calculation, under the assumption that the world’s land surface did not include Antarctica, and arrived at a range between 83.0 percent and 84.4 percent, using the following sources: *Encyclopedia Britannica* 1911, sv “Africa,” 1:352, “British Empire,” 4:606, “United Kingdom of Great Britain and Ireland,” 27:599; and the websites en.wikipedia.org and www.infoplease.com (accessed August 13, 2013). A data file detailing the calculation is available from the author (pth@hss.caltech.edu).

some of their possessions, such as the United States, had gained independence, they had spread their languages and ideas around the earth, and they wielded military power everywhere. Aside from the United States, a European clone, there was in fact only one non-European power that would dare stand up to their armies and navies—Japan, which was busy borrowing their technology and military know-how. No one would have expected that a thousand years ago.

Why were the Europeans the ones who ended up subjugating the world? Why not the Chinese, Japanese, Ottomans from the Middle East, or South Asians? All at one time or another could boast of powerful civilizations, and unlike Africans, Native Americans, and the inhabitants of Australia and the Pacific Islands, they all had access early on to the same weapons the Europeans used. And if you go back into the past, they would all seem to be stronger candidates than the Europeans. So why didn't they end up in control?

Finding out why is clearly important. After all, it determined who got colonial empires and who ran the slave trade. And it even helps explain who was the first to industrialize. But so far this question remains an unanswered riddle, and a particularly bedeviling one at that.

Now you might think that the answer is obvious: it was industrialization itself that paved the way for Europe's takeover. The Industrial Revolution began in Europe and gave Europeans tools—from repeating rifles to steam-powered gunboats—that assured their military supremacy. World conquest was then easy.

But things are not that simple, for if we step back a century, to 1800, the Industrial Revolution was scarcely under way in Britain and it had yet to touch the rest of Europe. Yet the Europeans already held sway over 35 percent of the globe, and their ships were preying on maritime traffic as far away as Southeast Asia and had been doing so for three hundred years.⁵ Why were they the ones with armed ships on every ocean, and

5 Europe itself was only 8 percent of the world's land surface (excluding Antarctica). My figure of 35 percent under Europe control in 1800 includes ex-colonies. That number, which is repeated in Headrick 1981, 3; Parker 1996, 5, also comes from Fieldhouse 1973, 3, who again cites no source. Using the same assumptions and definitions as in 1914, I repeated Fieldhouse's calculation for 1800 and got estimates (depending on assumptions about how much claimed territory was actually under European

with foreign fortresses and colonies on every inhabited continent, all well before the Industrial Revolution?

This question, once you begin pondering it, swiftly becomes a fascinating intellectual riddle, because the standard answers do not get to the bottom of the issue. Or they just fall apart once you begin to scrutinize them.

What then are those standard answers? There are really just two: disease and gunpowder technology.

Disease

The first of the standard answers points to the epidemics of smallpox, measles, and other crowd diseases that slaughtered natives of the Americas, Australia, and the Pacific Islands after the Europeans came ashore. The Europeans themselves were unaffected because they had been exposed to these diseases and were therefore resistant. Their immunity was what let them conquer the Americas and the Aztec and Inca Empires in particular.⁶

The Europeans, however, were not the only people with this biological edge, for all the major Middle Eastern and Asian civilizations had the same advantage. Why had they too—and not just Europeans—been exposed to the crowd diseases? The reason (as the biologist Jared Diamond has explained) is simply that there were more easily domesticated plants and animals in Eurasia than in the Americas and fewer geographical and ecological barriers to the diffusion of crops, livestock, and agricultural technology. That meant earlier agriculture in Eurasia, and with agriculture came villages, herds of animals, and ultimately cities, all of which served as breeding grounds for disease, and also trade, which spread epidemics.⁷ So if Chinese, Japanese, South Asian, or Middle Eastern invad-

control in the Americas or in Russian Asia) that ranged from 36 to 51 percent. Since Fieldhouse's number was even lower, I retained it; a data file with the assumptions behind my estimates is available from the author. My sources included those used for the 1914 calculation, plus Headrick 1981, 3; Taagepera 1997; Carter 2006, table Cfi.

6 See Crosby 2004; Diamond 2005 for two masterful accounts of the role of disease, and much more.

7 Diamond 2005.

ers had reached the Americas, they too would have survived, and Native Americans would still have perished. In short, even if disease is the crux of the matter, we still have to explain why it was the Europeans who were pursuing conquest, and not other Eurasians.

The claims about disease also fail to explain how the Portuguese could gain a foothold in South Asia at the turn of the sixteenth century and then successfully prey upon oceangoing trade. The South Asians were immune too, so disease gave the Portuguese no edge. They got no edge either from the easily domesticated plants and animals that Diamond has emphasized, for the Chinese, Japanese, Ottomans, and South Asians had them early on too.

There are other problems with the argument about disease too, even if we focus on the Aztec and Inca Empires. The assumption is that epidemics (of smallpox and measles in particular) were the single driving force behind the catastrophic collapse of the two empires after the conquistadores arrived. If epidemics wiped out much of the native population (so the argument would go), then they must have destabilized Native American society and made conquest easy. There is evidence in favor of such an argument. Smallpox does seem to have struck the Aztec capital, Tenochtitlan, at the end of 1520, only months before Hernán Cortés captured the city. With the Aztec king among the many victims, the survivors had to confront Cortés under a new and inexperienced ruler, who had not yet had time to consolidate his authority. A similar case can be made for Francisco Pizarro's conquest of the Inca Empire, for an epidemic killed the Inca ruler and helped to touch off a debilitating civil war that ended just as Pizarro arrived.⁸

The trouble, though, is that the demographic catastrophe in the Aztec and Inca Empires had multiple causes—and not just smallpox and measles—for otherwise the native population would have recovered even if the epidemics returned repeatedly. That at least is the conclusion of a demographic analysis that takes into account how populations react after being ravaged by new diseases like smallpox. And what kept the Native American population from recovering was the conquest itself, by wreaking havoc with their domestic life. Indians fled from warfare, and survivors

8 Hemming 1970, 28–30; Hassig 2006; Livi-Bacci 2006; Headrick 2010, 108.

were forced to work for the Europeans, often away from home, so that they could not provide their families with food. Indian women were also drawn into the conquerors' households, often as their sexual partners. In short, it became much harder for the Native Americans to have children, making much of the population decline the result, not of disease, but of brutal conquest itself.⁹ But then the argument that traces the conquest of the Inca and Aztec Empires back to social dislocation brought on by epidemics is simply far too narrow, because there were other causes behind the plummeting population, including the devastation visited on the native population by the conquistadores themselves.

There are also doubts that smallpox could have even triggered the Inca civil war, because it was unlikely to have reached the Incas before Pizarro arrived.¹⁰ It does seem to have struck the Aztecs, but we have to keep in mind that it killed Cortés's Indian allies too, although he could then replace their leaders with individuals loyal to him. We have to remember as well that many Aztecs survived the epidemic. Warriors were particularly likely to make it through, and there were enough of them to force Cortés to fight a bitter three-month siege before he finally took Tenochtitlan. The same was true for the Incas, whatever the epidemic was that had afflicted them. Despite all the deaths from disease, the Europeans therefore had to confront enemy units that were far larger than their own, even if they had native allies. The forces Pizarro faced when he entered the Inca Empire in 1532 were particularly daunting. He had only 167 men and no native allies, yet he managed to surprise the Inca imperial bodyguard of 5,000 to 6,000 men, crush them, and capture the emperor Atahualpa. He then extorted a ransom of 13 tons of silver and over 6 tons of gold (most of it melted down native artwork) before executing Atahualpa in 1533. For his brutal triumph against such odds, the rewards were gigantic—more than he and his men would have earned if they toiled for 250 years as laborers back in Spain. Nor was that the only victory against an overwhelming enemy. When the Incas rebelled in 1536,

9 Livi-Bacci 2006; mortality rates, as Livi-Bacci explains, would be highest in the initial epidemic, which would also explain why older Native Americans would be rare in records a generation later. For similar population behavior in North America, see Carlos and Lewis 2012.

10 Livi-Bacci 2006.

190 conquistadores in the city of Cuzco successfully resisted a yearlong siege by an Inca army of over 100,000.¹¹

The Gunpowder Technology

How could the Europeans triumph against such numbers? As an answer, disease alone fails. And how could the Europeans go on to conquer 35 percent of the world by 1800, and even more by World War I, with much of the acquired territory in Asia, where the population was immune to crowd disease, or in Africa, where the Europeans themselves were vulnerable to tropical maladies?¹²

For some military historians, the answer is clear: the Europeans simply had better technology. Epidemics and divisions among the natives helped in the Americas, Australia, and the Pacific Islands, but technology gave the Europeans the edge, particularly against the centralized empires of the Aztecs and Incas. It helped even more when they sent armed ships to the Indian Ocean and began to get a toehold in Asia. And it was the reason they could ultimately take over much of southern and northern Asia and virtually all of Africa (figure 1.1).

What was the technology? It was, first and foremost, the weapons and defenses spawned by a military revolution that swept through early modern Europe (Europe between 1500 and 1800) as gunpowder transformed warfare: firearms, artillery, ships armed with guns, and fortifications that could resist bombardment. It also included older piercing and cutting weapons that had been honed during the Middle Ages and that remained an essential part of fighting with gunpowder, through at least the sixteenth century and even beyond: swords, protective armor, lances for cavalry, and pikes for infantry to protect against charging horsemen.

¹¹ Hemming 1970, 36–45, 73, 190–191; Lockhart 1972, xiii, 10–15; Brooks 1993; Guilmartin 1995a; Clodfelter 2002, 33; Hassig 2006; Headrick 2010, 108. The figures for the daily wages of a Castilian laborer (35.10 maravedis per day in Leon) come from the Global Price and Income History Group at gpih.ucdavis.edu (accessed April 8, 2011); I have assumed 250 days of work per year. In defending Cuzco, the conquistadores did have help from native allies.

¹² Headrick 1981; 2010. Although not all of the territory claimed by Europeans was won militarily, their claims were always backed up by threat of using force, and that threat played a major role in the European takeover.

And it was the tactics and methods of organization that made it possible to squeeze more and more out of the weapons and defenses: how to turn crews and soldiers into an imposing fighting force, how to provide them with supplies efficiently, and how to get them to operate with speed and discipline even when under fire. The technology here encompasses a lot, and intentionally so, because it has to embrace everything that made victory more likely, from weapons to training and administration. Leaving part of the technology out in order to focus on the weapons alone would be a bit like trying to analyze the impact of computers by considering only the hardware and ignoring software and the Internet. As with computers, all the various parts of the gunpowder technology played a role in the European conquest, and they complemented one another and were continuously changing over time. Pikes, for example, defended musketeers against a cavalry charge, but they were eventually replaced by bayonets and disappeared by the early eighteenth century. The reason for all the change was that from the late Middle Ages on, Europeans were forever making the whole broad gunpowder technology more lethal and more effective, and they pushed it even further in the nineteenth century.¹³

The Portuguese deployed this technology when they sailed to South Asia at the turn of the sixteenth century. With it, they could use systematic violence (or the threat of violence) to shake down merchants, extract concessions from rulers, and draw allies to their side. Their armed ships could bombard cities and defeat larger fleets. And despite being outnumbered nearly twenty to one, they managed to capture the strategic port of Malacca (figure 1.2) by staging an amphibious landing during which their troops turned back attacking war elephants with their pikes. Once Malacca was in their hands, they immediately built a European-style fortress to protect it from attack. Such fortresses (which eventually spread through-

13 For the military revolution, see the seminal work of Geoffrey Parker and the ensuing debate in Black 1991; Rogers 1995; Parker 1996. Black 1998 mounts the strongest argument against Parker's thesis, but his detailed examples actually seem to support Parker. For the importance of piercing and cutting weapons in the gunpowder technology through the sixteenth century (for lances) and beyond (pikes until the end of the seventeenth century and swords into the eighteenth century), see Gheyn 1971; Kist 1971; Hale 1985, 50–55; Parker 1996, 17–18; Lynn 1997, 180–182, 383, 456–458, 490–499; Frye 2011.



FIGURE 1.2. Malacca.

out the Portuguese Empire) could store food, merchants' goods, and provisions for Portuguese ships, and when they could be relieved by supplies and forces brought in by sea, they were virtually impregnable. In 1568, for example, the fort in Malacca withstood a siege by a Muslim amphibious force that outnumbered the Portuguese and their allies 10 to 1.¹⁴

With elements of the same technology, Cortés and Pizarro could vanquish much bigger Native American armies. The cutting and piercing weapons—in particular, the swords and lances in the hands of horsemen—were Pizarro's greatest advantage, along with the discipline and experience of his forces, over half of whom had probably fought Native

14 Irwin 1962; Boxer 1969, 44–62; Diffie and Winius 1977, 224–227, 243, 249–260, 287–294; Manguin 1988; Subrahmanyam 1993, 67–98; Guilmartin 1995b; Subrahmanyam 1997, 109–112, 205–116, 252–268; and Birch 1875–1884, vol. 1: 5–6, vol. 2: 101–102, vol. 3: 134–136, vol. 4: 24; Parker 2000; Sun 2012. There was opposition to the strategy of relying on forts, which was Albuquerque's. On the early history of the fortification of Malacca, Manguin corrects the account given in Irwin.

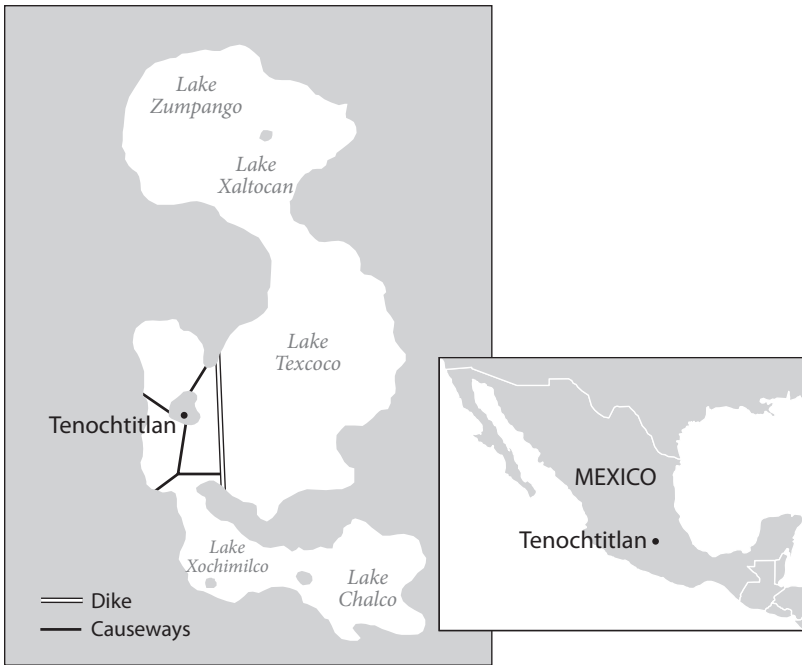


FIGURE 1.3. Tenochtitlan, the Aztec capital.

Americans before. His horsemen could scatter the Inca foot soldiers and then easily cut them down.¹⁵

Cutting weapons and discipline helped Cortés too, but so did other parts of the technology—in particular thirteen small armed galleys—brigantines—that he constructed in order to take Tenochtitlan. He needed them because the Aztec capital lay on an island in the middle of a lake (figure 1.3) and was connected to the shore by narrow causeways, making it difficult to take by force. Capturing the city was even harder than it seemed, for attackers on the causeways were vulnerable to Aztec archers in canoes, and bridges in the causeways could easily be removed to block attackers or to keep them from getting back to the shore. Cortés immediately grasped the problem when he was first allowed into the city in 1519.

15 Hemming 1970; Lockhart 1972, 22–24; Guilmartin 1995a; Headrick 2010, 113–115.

Having taken the Aztec emperor hostage, Cortés feared that he could easily be trapped away from shore and “starved . . . to death.” He therefore “made great haste to build four brigantines,” each with a cannon and able to carry seventy-five men. The brigantines could stop the Aztec canoes and transport Cortés’s men and horses wherever they were needed. To make their military superiority clear, Cortés brought the captive emperor aboard and fired the cannons.¹⁶

Eventually the Aztecs rebelled, drove Cortés out, and destroyed his brigantines. But he vowed to return, and one of the first things he did to retake the city was to build thirteen more of the galleys. They were important enough to have them constructed in safety, some fifty or so miles from the city, and then carried in pieces across rugged terrain so that they could be reassembled near the lake. And they were worth the effort. Besides defeating the Aztec canoes, ferrying men and supplies, and providing protection on the causeways, they cut off food to Tenochtitlan and, in the final battle, shelled buildings from canals that led into the city.¹⁷

Although there was certainly more to Cortés’s victory than just brigantines, they were clearly an important part of the gunpowder technology he had at his disposal. Some historians would nonetheless deny that the technology really mattered much at all. In their view, Cortés won not because of brigantines or other weapons, but because of other natives’ animosity to the Aztecs, which he could exploit to gain allies and eventually take the emperor’s place at the top. A similar argument would apply to Pizarro and the Incas, and to the Portuguese in South Asia.¹⁸

Allies were clearly crucial, as were divisions in the Aztec and Inca Empires. In the final campaign against Tenochtitlan, Cortés’s 904 Europeans were vastly outnumbered by some 75,000 Native Americans also on the Spanish side. These natives fought on land and in canoes on the lake, carried the brigantines and supplies to the lakeside, and cut breaches in the causeways to let the brigantines through during battles.¹⁹ But we

16 Gardiner 1956, 35–44, 62–71; Cortés, Elliott, et al. 1971, 103; Hassig 2006.

17 Gardiner 1956; Cortés, Elliott, et al. 1971; Lockhart 1993, 186–193; Hassig 2006, 134–135, 153–157.

18 For this argument, see Black 1998, 60–61; Kamen 2004, 121–122.

19 Gardiner 1956, 116–128, 154–155; Hassig 2006, 83–89, 123, 148–160.

must not forget that siding with Cortés was a strategic decision for his allies. They chose to join him for a simple reason: defeat of the Aztecs was possible only if they fought alongside Cortés. By themselves, they could not beat the Aztec army or take over Tenochtitlan, but with Cortés they could, and the reason was his powerful technology, for it could open a breach in the Aztec lines that the huge numbers of native allies could then exploit.²⁰ In short, his technology and their numbers were complementary; together they made Cortés look like a winner. Their decision to ally with him was in fact clear evidence of the power of his technology, not a sign that it was irrelevant.

The same holds for the Asian allies of the Portuguese.²¹ The divisions the Europeans exploited were common to all early modern polities, not just those that were conquered. They divided the European victors themselves. Pizarro, after all, was assassinated by fellow Europeans. In theory, anyone could exploit such tensions; it was not a tactic reserved to the Europeans. But to do so, you had to attract allies by appearing to be a winner. And with a small invasion force or tiny ship's crew that was possible only with better technology.

That is what this broad gunpowder technology allowed the Europeans to do. With it, handfuls of Portuguese could intimidate South Asia and then profit by muscling in on the spice trade and selling protection to Asian merchants. And it allowed small numbers of Europeans to seize the rulers of the Aztec and Inca Empires and eventually take their place at the top. From that apex of political power, the Europeans could extract resources from native tribute and forced labor, without ever having many colonists or any sort of an army of occupation. To be sure, the technology did have limits. In Africa, the Spanish and Portuguese failed to conquer the Angolan kingdom of Ndongo, and tropical diseases kept most Europeans at bay until the nineteenth century. And in the Americas, the Europeans had a much harder time with less hierarchical native groups such as nomadic Plains Indians, who could adopt elements of European technology themselves and then successfully wage guerrilla war into the nine-

20 Hassig 2006, 83–89.

21 Diffie and Winius 1977, 256–260; Guilmartin 1995b.

teenth century.²² But the Europeans continued to improve the technology and with it they eventually vanquished the nomads too.

Military historians (Geoffrey Parker in particular) make it clear that Europeans were at the forefront of the gunpowder technology, well before the Industrial Revolution.²³ Patterns of trade tell the same story and demonstrate Europeans had a comparative advantage in the technology, for from the sixteenth century on they were exporting firearms and artillery to the rest of the world, while European experts were being hired through Asia and the Middle East to help with gun making and with the tactics of fighting with gunpowder weapons. In seventeenth-century China, even Jesuit missionaries were pressed into service to help the Chinese emperor produce better cannons.²⁴

But if the broad technology of gunpowder weapons is the answer, then we still have an immense amount to explain, for it is in fact astonishing that Europeans had come to dominate this technology at such an early date. After all, the piercing and cutting weapons were common throughout Eurasia, not just in Europe, and the Europeans themselves marveled at the quality of the swords and daggers in Japan, which, they claimed, could “cleave asunder European iron almost without losing their edge.”²⁵ As for firearms and gunpowder, they had originated in China and spread throughout Eurasia, and for at least a while, states

22 Bethell 1984–2008, vol. 1: 171–176; Thornton 1988; Kamen 2004, 121–122; Headrick 2010, 111–123, 170. In the 1570s, there were perhaps 8 to 10 million Native Americans in Spanish America, but only 150 thousand or so people of Spanish ancestry: Bethell 1984–2008, vol. 2: 17–18; Livi-Bacci 2006, 199.

23 Rogers 1995; Parker 1996.

24 See Parry 1970; Inalcik 1975; Parker 1996, 129–136; Black 1998, 30–32, 83–84; Heywood 2002; Agoston 2005, 10–12, 193–194; and Hoffman 2011, who shows that in the seventeenth and eighteenth centuries, the relative price of handguns was lower in Europe than in Asia. Comparative advantage here means it was more efficient for Europeans to use their resources in making weapons rather than, say, food. Much of the argument in this book, though, will concern absolute advantage: more advanced technology allowed the Europeans to use their military resources more efficiently than anyone else. The Jesuits: Josson and Willaert 1938, 361–364, 580; Needham 1954, 5, part 7: 392–398; Spence 1969, 6–9, 14–15, 26; Waley-Cohen 1993.

25 Maffei 1590, 558. The quote comes from the official Latin history of the Jesuit mission to the east, written by the Jesuit humanist Giovanni Pietro Maffei; for him and the sources he used, see Lach 1965, vol. 1, part 1: 323–326.

outside western Europe did become proficient at manufacturing or exploiting the new arms. The Ottomans, for instance, made high-quality artillery in the early sixteenth century.²⁶ The Chinese and perhaps the Japanese too discovered—well before Europeans—the key tactical innovation (volley fire) that allowed infantry soldiers with slow-loading muskets to maintain a nearly continuous round of fire.²⁷ Yet by the late seventeenth century, if not before, Chinese, Japanese, and Ottoman military technology and tactics all lagged behind what one found in western Europe. They could adopt the latest military innovations and at times improve the gunpowder technology on their own too. But they could not keep up with the relentless pace of military innovation set by the Europeans.²⁸

Why did these other powerful states fall behind, even before the Industrial Revolution began? And why did the Europeans continue to push the gunpowder technology further than anyone else on up through the nineteenth century? Those are the questions that must be answered if we want to understand why it was Europeans who conquered the world, and not someone else.

So far the best response is that military competition in Europe gave the Europeans an edge. The argument has been formulated most cogently by Paul Kennedy, who points to Europe's competitive markets and persistent military rivalries. In his view, while military rivalry created an arms

26 Guilmartin 1974, 255–263; Agoston 2005; Agoston 2014, 100–106.

27 With volley fire, infantrymen were trained to line up in long rows. The first row would fire their muskets, and while they were reloading, the rows behind them would take their place on the firing line. Volley fire appears in the 1590s in Europe, perhaps as early as the 1570s in Japan, and back in the late fourteenth century in China; on this, see Parker 1996, 18–19, 140–141; Sun 2003, 500; Lamers 2000, 111–115; and Andrade forthcoming, 188–207, 219, 236. I thank Tonio Andrade for sharing the manuscript of his marvelous forthcoming book, which has a wealth of information on volley fire—and the gunpowder technology more generally—both in East Asia and Europe.

28 Agoston, 10–12, 193–94, for example, argues that the European technological superiority was minimal, at least until the late seventeenth century, but he does admit that it was “European military experts who sold their expertise to the Ottomans and not vice versa.” For independent advances in the gunpowder technology in Asia, see chapter 3 and Sun 2003; Lorge 2005; Swope 2005; Lorge 2008; Swope 2009; Andrade 2010; Andrade 2011; Sun 2012; Andrade forthcoming. Europe's lead was more pronounced in some areas than others. Andrade's work suggests, for example, that by 1700 European warships were likely more effective than Chinese war junks, but European infantry drill was no better at all.

race, competitive markets fostered military innovation and kept any one country from taking over the continent and bringing the competition to a halt.²⁹ The ongoing innovation gave the Europeans early supremacy in the technology and eventually helped them dominate the world.

If competition was spurring continued military innovation, then the military sector in Europe should have experienced rapid and sustained productivity growth from an early date. It turns out that it did, and well before the Industrial Revolution.³⁰ But competition is not the final answer, for it leaves far too much unexplained. To begin with, competitive markets do not always stimulate innovation. The clearest example comes from agriculture in early modern Europe, which had highly competitive markets but witnessed virtually no productivity growth.³¹ What kept early modern European farmers from reaping the productivity gains of soldiers and sailors? What, in short, other than competition alone, was different in the military sector?

Nor do ongoing military rivalries always promote innovation. They in fact failed to do so in eighteenth-century India and Southeast Asia. The case of India, as we shall see, is particularly illuminating, for like Europe it had markets and incessant warfare, and the combatants were quick to adopt the latest weapons and tactics. The innovations, however, by and large originated in the West.

The Tournament

It seems then that our fundamental question still has no satisfactory answer. But there is a way to resolve this enigma. The resolution lies with the peculiar form of military competition that European states were engaged in. It was what economists would call a “tournament”—the sort of competition that, under the right conditions, can drive contestants to exert enormous effort in the hope of winning a prize. To take a modern example, think, for instance, of talented young baseball players in, say, the Dominican

29 Kennedy 1987, 16–24.

30 Hoffman 2011; and Carlo Cipolla’s pioneering study Cipolla 1965.

31 Hoffman 1996; Clark 2007. Whether competitive markets do stimulate innovation will depend on property rights and other factors.

Republic, who are striving to make the big leagues. To get even a slight edge over other players, they forgo education, spend all day working out, and take every steroid imaginable even if it damages their health, all for a minuscule chance of appearing in a major league uniform.

Between the late Middle Ages (1300–1500) and the nineteenth century, Europe witnessed a tournament with just as much intensity and commitment. The European one, however, was far more serious, for it repeatedly pitted the continent's rulers and leaders against one another in warfare that affected the lives of people around the globe. The prize for the rulers engaged in this grim contest was financial gain, territorial expansion, defense of the faith, or the glory of victory. To snatch the prize, they raised taxes and lavished resources on armies and navies that used the gunpowder technology and advanced it by learning from their mistakes or, especially in the nineteenth century, by doing research. The flood of resources channeled into warfare continued unabated up into the nineteenth century, even when it harmed the rest of the economy. In Europe, political conditions made it possible to mobilize gigantic sums for armies and navies, and military conditions favored the gunpowder technology, which, because it was new, had enormous potential for improvement by the sort of learning by doing that was going on in Europe before 1800.

Elsewhere, political and military incentives worked against such an outcome, even when warfare was frequent, and that is why Europeans pushed the gunpowder technology further than anyone else. The Europeans raced even further ahead in the nineteenth century, when political change and an expanding stock of useful knowledge made it easier to advance military technology via research, even though there were fewer wars within Europe itself. Meanwhile, despite sales of weapons and military services, the rest of the world fell way behind. Too many economic and political obstacles blocked the wholesale transfer of the gunpowder technology and the mobilization of resources on the same scale as in Europe.

Understanding why requires a look at the political, military, and fiscal incentives rulers faced, both in Europe and in China, India, Japan, and the Ottoman Empire. It also requires an examination of other military technologies besides gunpowder. We will start in chapter 2 with Europe before 1800 and use it to sketch a simple model of a repeated tournament, which will then be applied to Asia and the Middle East in chapter

3 and to Europe after 1800 and nineteenth-century colonialism later in this book. The model makes clear, once and for all, the political and military conditions that distinguished Europe from the rest of the world. These conditions were what set the European tournament on its peculiar course, and they explain why Europeans came to dominate the gunpowder technology and why they—and not someone else—conquered the world, with consequences that ranged from colonialism to the slave trade and even to the Industrial Revolution.³²

The question then becomes why political and military conditions were so different in Europe from what they were in China, Japan, India, or the Ottoman Empire—the subject of chapter 4. A variety of answers—among them, geography and kinship ties—may at first glance seem plausible, but the only one that fits the evidence is political history—in other words, the peculiar train of past events that launched each part of Eurasia onto a distinct path of political development. The political history here ranged from the early formation of a powerful Chinese Empire in East Asia to the centuries after the collapse of the Roman Empire when western Europe had no highly developed states. Political history unleashed the European tournament and kept it going, and it worked against a similar outcome elsewhere in Eurasia. And as chapter 5 shows, it put the military advances created for European war into the hands of European entrepreneurs, who could employ the gunpowder technology to establish settlements or colonies or prey upon trade abroad. Political history is then the ultimate cause here, but that means that the outcome was not at all preordained. A different turn of events, at a few pivotal moments, could easily have made another power the likely master of the world. If Charlemagne's descendants had not fallen to fighting with one another and the Mongols had not subjugated the Chinese Empire, then we might be asking why China conquered the globe. And that (so chapter 5 suggests) is far from the only plausible scenario that would have fashioned a world totally unlike our own.

32 For arguments that the Industrial Revolution was at least in part caused by Britain's naval spending and by the share of international trade that its military victories won, see O'Brien 2006; Allen 2009; and chapter 7 later.

With their dominance of the gunpowder technology, Europeans toppled the Ottoman Empire from the ranks of the great powers and began the conquest of India, all in the eighteenth century. As their lead widened in the nineteenth century, they gobbled up Africa, and, along with their former colonies in America, they finally succeeded in bullying China and Japan into making trade concessions. To analyze the political and economic reasons behind this growing lead, chapter 6 extends the tournament model and uses it to make sense of what was a cold war within Europe itself, a cold war with heavy military spending and startling advances in military technology.

World War I and World War II sapped Europe's military dynamism, and after 1945, European states other than Russia were reduced to the role of bit players on the military stage. Using the tournament model, chapter 7 explains why. It then asks who profited from the European conquest and what role this conquest played in the Industrial Revolution and the great enrichment of the West.