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# THE SILK ROAD

James A. Millward  
 A Very Short Introduction

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*For Herrgottsbescheißerle and all their cousins*

The first person to use "silk road" in a title was another German geographer, August Hermann, who published books and atlases relating to the subject in the early 1900s. The title of his 1915 essay, "The Silk Roads from China to the Roman Empire," highlights another common, but misleading, sense attached still today to the silk-road notion: that its importance lay mainly in linking China to the Mediterranean basin, the "east" to the "west." Such a focus on the termini of trans-Eurasian trade is understandable. Our best historical sources from this early period are in fact in Chinese, Greek, and Latin. Moreover, to discover ancient Roman glass in what is now Chinese territory, or to read of Roman ladies sashaying in sheer silks from Serbia astounds us, simply because the distances involved are so great. But to focus only on the ends of the silk roads misses the point in several ways.

First of all, the main significance of Eurasian transcontinental exchanges—the phenomenon summed up with the term "silk road"—lies not so much in the trade in silk *per se*. In fact, there were many things traded and many ideas transmitted across Eurasia, some of which (the domesticated horse, cotton, paper, and gunpowder) had a far greater impact than silk. Moreover, long-distance exchanges continued after they no longer principally involved silk. Conversely, Chinese trade in silk textiles with Central Asian partners closer than the Mediterranean continued unabated into the nineteenth century and remained significant, contributing among other things to the financing of the Manchu Qing Empire's expansion deep into Central Asia, increasing China's territory by a sixth.

Nor should we think the silk road involved only east-west exchanges across the steppe routes at the midpoint of the continent. To do so neglects the region comprising what is now north India and Pakistan, which was not only the transit point for most Han-Rome trade but also contributed such major items as cotton textiles and Buddhism to the Eurasian marketplace of goods and ideas. Likewise, a succession of Persian empires not

only facilitated, regulated, and taxed silk-road trade but shaped it through demand for particular goods and cultural contributions flowing east and west. The Persian language, moreover, was for centuries the *lingua franca* of the silk road.

The narrow conception of the silk road as an east-west route between China and Rome likewise obscures the fact that there was not one "road" but rather a skein of routes linking many entrepôts. Historians think of the silk road more as a network than as a linear route; to map it by simply drawing a couple of horizontal lines across the center of Eurasia and the Indian Ocean, as textbooks tend to do, gives a false impression.

Finally, to focus on contacts between urbanized, agrarian civilizations, while ignoring "the spaces in between"—in British explorer and politician Rory Stewart's phrase—reflects an old bias on the part of farmers and city people across Eurasia with regard to the pastoralist and nomadic inhabitants of Central Eurasia. These people, though often depicted by outsiders as barbarians, were in fact prime historical movers and promoters of silk-road exchanges—"proto-globalizers" as well as conquerors. For example, copper ores exported from the Eurasian steppes in 2100-2000 BCE supplied the Bronze Age metallurgical revolution in Mesopotamia and the Iranian plateau. Chariot warriors, and the technology of the chariot itself, followed the same route. Or, to choose a cultural example, many of the plucked and bowed stringed instruments in European and Asian ensembles today derive from instruments first developed by or with the help of horse-raising peoples of the steppe, and were spread across the continent by Central Eurasian nomads.

## Land and man in Central Eurasia

The region known as Central Eurasia is important to us because the silk road spans it, of course, but also because the dynamics of Central Eurasian history, especially the activities

Although they use less loaded terms, modern scholars still grant environment a major, if not determining, role in shaping the social, economic, and political dynamics of Central Eurasia. The environment of steppe, desert, and mountain meant that Central Eurasian nomads relied on a herding economy and thus lacked grain, other crops, and many manufactures and luxuries they needed or wanted. They did have horses and equestrian military skills, however, which gave them a military edge over the hot southern agrarian lands where horses could not thrive. This created a dynamic whereby nomad herders interacted with sedentary farmers and city-dwellers by trading or raiding—and often a combination of the two. Due to the danger of overgrazing dry lands, nomads usually lived and herded in small family groups. They maintained ties to larger kin units—the clan and tribe—and myth and historical memory linked them to still larger solidarities, the equivalent of ethnic or national units. At times of crisis or opportunity, nomads could form large, militarily powerful imperial confederations under a ruling elite and common label bearing both ethnic and political meaning, such as Hun, Turk, or Mongol. These confederations could unify vast steppe territories and conquer agrarian states to the south. Gibbon, then, was right that the sociopolitical organization, individual hardness, easy mobilization for war, and formidable equestrian skills of the nomads were shaped by their environment, though he was of course wrong to consider them unreasoning beings living like quadrupeds in a state of nature. There is an erroneous tendency to view empire-building by rulers from urban-agrarian kingdoms (Alexander, for example) as strategic genius, while treating nomad imperial conquests like natural disasters. It makes more sense to recognize that from the second millennium BCE through the eighteenth century CE, Eurasian nomadic societies and their leaders worked deliberately within both their natural and geopolitical environments to leverage their narrow but potent comparative military advantage over sedentary societies for economic sustenance or gain, and, sometimes, for the purposes of territorial expansion.

Because the nomadic herding way of life was so different from that in cities or in peasant farming villages, it has also been common to draw a stark line between “barbarian” peoples of the steppe and those of “civilized” societies. Gibbon reflects this trend to depict herders as fundamentally unlike agriculturalists, but it is just as prevalent earlier and elsewhere around the Eurasian rim. Consider the description of the Xiongnu (pronounced Hsiung-nu, a term related to “Hun”) nomads by China’s founding historian, Sima Qian (145–86 BCE):

The little boys start out by learning to ride sheep and shoot birds and rats with a bow and arrow, and when they get a little older they shoot foxes and hares, which are used for food. Thus all the young men are able to use a bow and act as armed cavalry in time of war. It is their custom to herd their flocks in times of peace and make their living by hunting, but in periods of crisis they take up arms and go off on plundering and marauding expeditions. This seems to be their inborn nature. . . . If the battle is going well for them they will advance, but if not, they will retreat, for they do not consider it a disgrace to run away. Their only concern is self-advantage, and they know nothing of propriety or righteousness.

More vociferously racist is the depiction of the Huns by the fourth-century CE Roman historian Ammianus Marcellinus:

From the moment of birth they make deep gashes in their children’s cheeks, so that when in due course hair appears its growth is checked by the wrinkled scars; as they grow older this gives them the unlikely appearance of beardless eunuchs. They have squat bodies, strong limbs, and thick necks, and are so prodigiously ugly and bent that they might be two-legged animals. Their shape, however disagreeable, is human. They have no use for seasoned food, but live on the roots of wild plants and the half-raw flesh of any animal, which they warm a little by placing it between their thighs and the backs of their horses. They have no buildings to shelter them. They wear garments of linen of the skins of field-mice stitched together.

Once they have put their necks into some dingy shirt they never take it off or change it till it rots and falls to pieces. They have round caps of fur on their heads, and protect their hairy legs with goatskins. They are ill-fitted to fight on foot, and remain glued to their horses, hardy but ugly beasts, on which they sometimes sit like women to perform their everyday business and they even bow forward over their beasts' narrow necks to enjoy a deep and dreamy sleep.

But we need not look so far into the past to find negative images of the peoples of Central Eurasia. Think only of the Disney movie *Mulan*, in which the Shan-yu, swarthy and hulking, evil eyes aglow, swarms over the passes with his myrmidon hordes.

### Inner Asian empires and the silk road

With such dark shadows cast through the ages to terrorize today's Disney princesses, it is a challenge to rethink the historical role of the peoples and polities of Central Eurasia. But the nomad peoples and polities of Central Eurasia were more than marauding conquerors. Rather, they were essential to trans-Eurasian connectivity in several ways.

First, the line between steppe and sown was not as firmly drawn as Gibbon, Sima Qian, or Ammianus imply, but was in fact politically and culturally fluid. Relations between nomads and the oases cities were often very close, with nomad powers providing protection and facilitating trade for the oases, and of course, exchange of livestock for agricultural products was advantageous to both. Some semi-nomads even farmed a little for part of the year. Herodotus mentions "farming Scythians" near the Black Sea. Even in the far east, where China's Great Wall seems to define an indelible divide between Chinese farmers and northern herders, reading between the lines of Chinese sources of almost any era reveals a more ambiguous distinction on the ground, with ongoing trade, military alliances, intermarriage and all sorts of linguistic and cultural mixing.

Sima Qian tells of a Chinese marquis who allied with the nomadic Rong peoples to attack the king of the Chinese state of Zhou; of a later king of Zhou allied with "barbarians" (in fact, his in-laws) to attack the Chinese state of Zheng; of how the Yiqu tribes built walls to protect themselves from the Chinese state of Qin; and of the Qin queen mother who bore two bastard children following illicit relations with the Yiqu ruler—not an easy thing to do across an existential divide. The most telling example of this early cultural hybridization in what is now north China and Mongolia was an edict by the king of the Chinese state of Zhao that his people should stop wearing robes and switch to trousers, the better to ride and shoot in. Reading Sima Qian's account, one wonders if the distinction between "Chinese" and "barbarian" was made only after the fact, by commentators like Sima Qian himself. And universally across Eurasia the great agricultural kingdoms and empires were controlled for long periods of time by dynasties of northern tribal conquerors, which thus enter the histories of Russia, Anatolia, Mesopotamia, Persia, India, Central Asia, Tibet, China, Korea, and elsewhere. There was no hard boundary between the nomadic herders of Central Eurasia and their agrarian neighbors; Central Eurasians were neither exclusively nomadic nor always pastoralist; and they enjoyed relations of many sorts with urban and farming communities, not all of them violent. They played a prominent role in Eurasian history.

Most important for the silk road, Central Eurasians participated in and influenced transcontinental economic and other exchanges in several ways. Even when not united in a large confederation, common nomads traded at border markets, visited oases to exchange livestock and other pastoral goods in bazaars, and protected—or imposed protection rackets on—merchant caravans. But large nomad empires were especially important for silk-road exchanges. They needed revenue to make up for diverting much of the productive herding population into military duty, to pay for administrative overhead, and so that the ruling khan could distribute largess to clan members and subordinate headmen to

maintain their loyalty. Loot obtained from conquest provided some of this revenue, but extracting tributes from conquered peoples and taxing trade were more sustainable in the long run. Not all Central Eurasian states were equally good at making the transition from a revenue stream based on booty to one based on systematic exchange of goods, but many were commercially minded or, if not, retained merchants to work for them. The movements of tribute and trade goods, under control of Central Eurasian empires, drove many silk-road interactions.

When nomad empires maintained relative stability and built communications, this encouraged trade and travel, generally: it is no coincidence that the cosmopolitanism of China's Tang dynasty corresponded to an era when Turk influence extended from Mongolia to the frontiers of India and Byzantium, or that the Polos and European missionaries first reached China when Eurasia was under Mongol rule. Nomad states actively partnered with merchant communities, such as the Soghdians, Armenians, Bukharans, or Uyghurs, to deal with sedentary states and provide their regimes with administrative and fiscal expertise. And the consumption choices of nomad elites and commoners shaped what southern states produced and sold. Most spectacularly, the lavish imperial Mongol courts in China, Mongolia, and Persia encouraged the circulation of their favorite trade goods, artworks, and craftsmen from all across Eurasia. Today we may shop in China for silks or knock-off Louis Vuitton. We may not think of the frightening Shan-yu from *Mulan* as doing the same thing, but he and his ilk were key links and even trendsetters in an international commercial chain during the high points of silk-road communication across Eurasia.

## Religious realms

Finally, a word about the role religions, monks, and missionaries played on the silk road. Whereas large empires facilitated exchanges along the silk road through political and military

consolidation, the spread of religions did the same by creating religious and cultural realms, zones of shared faith and common religious institutions that overlapped and transcended political and even linguistic boundaries. Missionaries often traveled on the same routes or even together with merchants, affording them the promise of divine protection along the way. Monasteries in remote places served as way stations, pilgrimage centers as market towns, and common faith and knowledge of scriptural languages made travel easier for co-religionists far from home. Moreover, many religious personnel were literate and brought texts and high culture with them as they traveled.

Travel and proselytizing by religious figures had several effects. Unlike merchants, who tend to keep commercial intelligence secret, religious specialists wrote about their journeys. Some of our best information on the silk road comes from monks and missionaries. The seventh-century Tang Buddhist monk Xuanzang left a geographical account of the "Western Regions" through which he traveled en route to India; this text formed the core of Chinese geographical knowledge about Central Asia and India for centuries, and later helped the archaeologist Aurel Stein discover ancient cities buried in the Taklamakan Desert. Ibn Battuta traveled in Africa, eastern Europe, the Middle East, South Asia, Central Asia, Southeast Asia, and China in the fourteenth century, encountering Muslim communities everywhere he traveled. His knowledge of Islamic jurisprudence secured him a warm welcome, gifts, work, and even wives almost everywhere he went.

Religions also offered political regimes, especially imperializing nomad states, a cultural package that included a script, bodies of knowledge including scientific and legal expertise, and clerical personnel, in addition to the promise of salvation or enhanced reincarnation. Manichaeism, which arose in the third century CE in Persia, once had adherents from northern China to the Roman Empire (St. Augustine of Hippo flirted with Manichaeism as a youth in the fourth century). Though extinct today, that dualistic

religion was adopted by the nomadic Uyghur state in the eighth century, and Manichaean scribes bequeathed to the Uyghurs a version of the Syriac script once used for the Aramaic language. The script was in turn modified to write Mongolian by Uyghur scribes serving the Mongol Empire. The Uyghur-Mongol script was then adapted by the Manchus to fit their own language. These fearsome seventeenth-century conquerors of China wrote in a script descended from that with which the first Christians transcribed the words of Jesus. Ultimately, it was the Manichaean religion that brought the script east.

#### The Silk Road

Finally, much more than religion circulated through religious networks and via the writings of religious figures. The many centuries of early interaction between India and China brought aspects of Indian science, technology, art, and literature to China along with the Buddhist doctrine and iconography. In the Islamic world, even after the caliphs no longer exercised real control over all Islamic lands, the temporal-religious Islamic system and the shared Arabic and Persian languages facilitated the circulation of knowledge over much of Eurasia. In this way, for example, Ibn Sina, working in the Central Asian city of Bukhara, synthesized Hellenic and Islamic medicine into a system later adopted in western Europe. Or, from the sixteenth to the eighteenth centuries, Jesuits brought European astronomy, cartography, mathematics, art, music, and other knowledge to the Chinese court, and transmitted detailed information about China back to a Europe that had hitherto known only the quasi-fabulous tales of Marco Polo. Complementing the unification and infrastructure built by imperial powers, then, religions overlaid a kind of cultural field across large swaths of Eurasia, stimulated communication, and stretched their intellectual connective tissue along the silk roads.

The term "silk road" thus refers to more than just trade in silk between China and Rome over a few centuries. It stands for the exchanges of things and ideas, both intended and accidental, through trade, diplomacy, conquest, migration, and pilgrimage

that intensified integration of the Afro-Eurasian continent from the Neolithic through modern times. Warriors, missionaries, nomads, emissaries, and artisans as well as merchants contributed to this ongoing cross-fertilization, which thrived under imperial and religious unifications.

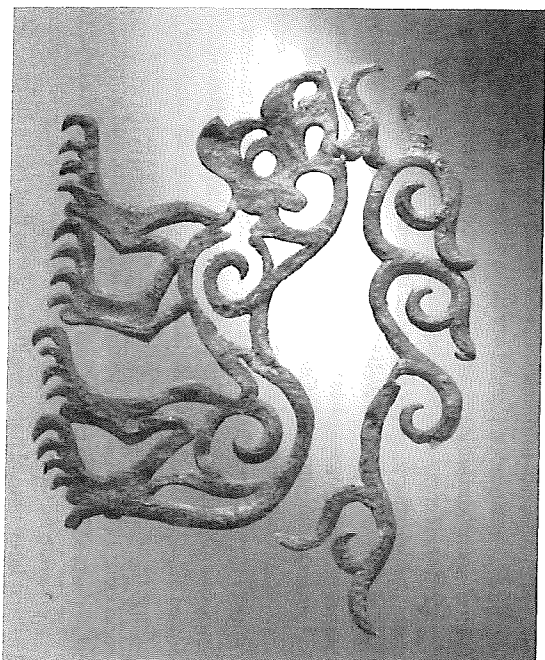
Another major historical cross-fertilization, the Columbian Exchange, occurred when maritime communications were opened between the Old World and the New from the beginning of the sixteenth century. What resulted was an abrupt—in historical terms—and traumatic exchange of germs, plants, animals, and, of course, human populations between Afro-Eurasia and the Americas. That millions of people in the Americas with no prior immunities died from exposure to old-world crowd diseases is just one of the profound effects of the Columbian Exchange.

The silk road had no such clearly identifiable point of departure, and was more in the nature of a growing acquaintanceship than a sudden encounter. But its effects on world history are no less profound for that. By understanding the biological, technological, and cultural commonalities shared across the continent, we see that much of what we consider the intellectual, religious, political, or economic patrimony of "the West" or "the East"—or Christendom or Islam or Europe or Africa or Asia—are actually varied expressions of what was, on a fundamental level, an Afro-Eurasian joint venture.

animals and birds in what is known as the "animal style" of early Eurasian art.

Scythian military skills easily defeated other Iron Age powers. Darius the Great (r. 521–486 BCE), of the Achaemenid dynasty, added both northwestern India and southeastern Europe to his Persian Empire. But Darius nearly foundered when he marched north against the Scythians, despite an army hundreds of thousands strong. To the Persians' surprise, the nomads simply melted away before them. Darius called the Scythian ruler a coward; according to Herodotus his Scythian adversary replied

The Silk Road



3. A leather saddle ornament in the shape of a horned tiger from a tomb in Pazyryk in the Altai mountains, sixth century BCE. Artifacts in the vigorous and fantastic "animal style" are found among grave goods from the Scythians and related Iron Age nomad groups all across Central Eurasia. Antlers seem to hold special significance, as horses were buried with masks with antlers attached and common curvilinear decoration seems to derive from antler depictions.

that "in our country there are no towns and no cultivated land, fear of losing which, or seeing it ravaged, might indeed provoke us to hasty battle." His supply lines dangerously overextended, Darius ultimately retreated in ignominy, having fallen for the oldest trick of the Central Asian nomads: the tactical retreat.

The Scythians were more than pastoralists and warriors; they also oversaw the busy trade from the Don and Dnieper basins to the Black Sea, and even supplied grain to the Greeks. Their *kurgans* contain goods from distant parts, evidence of extensive trade relations. The Pazyryk tomb complex in the Altai Mountains held silks, a bronze mirror, and a cup from China as well as a tied carpet probably from Persia or Central Asia. But the Scythian burials are noted mainly for bronze, gold, felt, leather and wood items, and even tattoos in the animal style: predators pouncing on prey, hybrid beasts, and curly decoration reminiscent of elk antlers. The ubiquity of this style speaks to the Scythian cultural reach, from the North Balkans to the frontiers of China.

### The classical silk road (third century BCE–third century CE)

The Xiongnu arose somewhat later than the Scythians, in what is modern north China and Mongolia, and conquered territory as far west as modern Uzbekistan. They probably did not speak an Indo-European language but one in the Altaic family from which Turkic and Mongolian tongues would later derive. What we know about the Xiongnu comes mainly from Chinese sources, since the Qin (221–206 BCE) and Han (206 BCE–220 CE) dynasties in China engaged in an off-and-on conflict with the Xiongnu for some 350 years, and events associated with this rivalry helped open the classical eastern silk road. As the Qin consolidated power in what is now north China in the late third century BCE, it drove Xiongnu tribes north and out of their pastures alongside the Yellow River. The Qin walled off the newly conquered territory with "long walls"—the first Great Wall.



A ruthless young prince, Maodun, came to power in the ensuing crisis among the Xiongnu. Using a whistling arrow to indicate his targets, Maodun trained his elite guard to shoot to kill whatever and whomever he commanded. He began by targeting his own favorite horse; when his guard obeyed and shot it, he moved on to his favorite wife, his father's favorite horse, and finally his father himself. As *shanyu*, or ruler, Maodun absorbed or drove off neighboring tribes, attacked the Han to the south, and seized back lands formerly taken by the Qin. Ultimately, the Han emperor was forced to appease the Xiongnu by dispatching Chinese princesses and paying tributes amounting to 200,000 liters of wine, 92,400 meters of silk, and 1,000 ounces of gold annually.

Maodun's successor, Laoshang, smashed the Yuezhi, a powerful nomad confederation in Xinjiang and northwest China. Laoshang fashioned the Yuezhi ruler's skull into a drinking cup, and Yuezhi tribal fragments scattered, some migrating by the mid-second century BCE as far as the northern banks of the Amu Darya in modern Tajikistan and Uzbekistan. Meanwhile, with the Yuezhi gone, the Xiongnu were able to take control over the farming oases in the Tarim Basin (modern Xinjiang), thus securing a source of grain, tribute, and trade revenue.

Despite Han appeasement, the Xiongnu continued their sporadic raids. After nearly sixty years of this, Wu, the new emperor, adopted a more aggressive policy, thus inaugurating more than two centuries of Han struggle with the Xiongnu over the necklace of Tarim Basin oases. Seeking allies and intelligence, in 139 BCE Wu dispatched a minister named Zhang Qian on a mission to Central Asia. The Xiongnu caught him, but after a decade in Xiongnu captivity (where he had children with a Xiongnu wife), Zhang Qian continued west through Central Eurasia to the pastures of the Yuezhi.

Han strategists had hoped the Yuezhi would harbor a grudge against the Xiongnu (who had, after all, turned their king's skull

into a drinking cup) and join forces against them. Zhang Qian's diplomacy was to no avail, however, and the Yuezhi strayed put in their new lands. Still, when Zhang Qian eventually made it back to Han territory, he brought intelligence that greatly expanded Chinese geographic, ethnographic, and political knowledge of Central Eurasia, paving the way for later diplomatic and commercial exchanges. For example, his comment that Ferghana (Dayuan) raised "blood-sweating" steeds bred from the so-called horses of heaven stimulated a Chinese demand for these tall and powerful animals. And access to Chinese merchants and goods accompanying subsequent Chinese diplomatic missions to Central Asia launched the centuries-long career of the silk road's most successful merchant guild, the Soghdians. From around Samarkand originally, the Soghdians ultimately worked and lived from the Black Sea to Korea.

The Yuezhi are a prime example of how the silk road mingled nomadic and sedentary peoples and cultures over great distances. Displaced from the Chinese frontier, the Yuezhi and confederated tribes evolved by the first century CE into the Kushan Empire, a state that combined Central Asian nomadic with Persian, Indian, and Hellenic influences, at the hub of the Old World land-and-sea trade routes. In the fourth century BC, Alexander the Great had campaigned into north India and Central Asia. Kushan rule extended over the Hellenized city-states left by Alexander in Bactria (today's northern Afghanistan), as well as the kingdoms of north India, including the vital trade center of Taxila (northwest of Islamabad on the Grand Trunk Road in modern Pakistan) and Mathura farther south. The eastern extent of their influence at times took in Khotan and Loulan in the Tarim Basin, where Kushan documents have been found written in an Indian language called Prakrit. Kushan coins bore Greek or Kharoshthi script along with images of their kings, Greek, Persian, and Hindu gods, and of the Buddha. Reliable coinage helped Kushan broker commercial exchanges between China, India, Persia, and, ultimately, Rome. Kushan became a great patron of Buddhism and promoted the

dissemination of the faith through Central Asia, en route to East Asia.

This was the classical era of the silk road, when the Mediterranean basin, Mesopotamia, Persia, Central Asia, and China fell under the centralized control of a handful of empires. Despite the rivalries and wars between the Han and the Xiongnu or between Rome and Parthian Persia—we are told that the Parthian banners at the Battle of Carrhae in 53 BCE were the first silks ever seen by Romans—the development of diplomacy and maintenance of transportation networks stimulated trade, religious dissemination, and a general increase in geographic knowledge across the continent.

### A Dark Age? (third–fifth centuries CE)

In the 1930s, the social scientist Frederick Teggart looked at the Eurasian connections between Rome and Han and their shared problem with “barbarians” on the frontiers; he wrote a book attempting to explain what he saw as correlations between Eastern and Western history. Wars in the Roman east and barbarian invasions along the Danube and Rhine were ultimately the result, Teggart argued, of policies of the Han government. How? Through trade and nomadic migrations. Wars in the Tarim Basin disrupted trade that would have passed through Parthia, which in turn made trouble on the eastern Roman frontier in Armenia. Likewise, Han policies to split the Xiongnu set tribes in motion across the steppe to Russia, who in turn drove other “barbarian” tribes before them, right up to the Roman northern frontier in Europe.

Teggart’s thesis was a bold attempt at Big History: to get beyond individual nations or even empires and see the global picture. The silk road certainly lends itself to broad-canvases analyses. Moreover, Teggart may have been inspired by the global linkages of World War I and the Great Depression in his own day. Teggart’s reach exceeded his grasp: he could not prove that his correlations

were not simply coincidences. Nor were the consequences of interrupted luxury trade in the first century really comparable to those of modern trade protectionism, since the economic value of international trade in most old-world economies was miniscule. Still, the parallels across the continent are striking, and the mobility of nomadic tribes was such that major military or political events on one end of the continent could conceivably affect the other.

One intriguing connection concerns the Xiongnu. The words “Xiong” and “Hun” are phonetically related. A Soghdian letter discussing a Xiongnu attack in 316 CE spells the nomads’ name as *xwn*—that is, Hun. Were the Xiongnu, then, the ancestors of the Huns who established an empire on the Pontic steppes in the fourth and fifth centuries, invaded northern Europe, and possibly touched off the era of “barbarian” migrations into Europe? There is no evidence of a direct link, but Xiongnu descendants may have made up a ruling elite among the largely Germanic-speaking masses of the Hun confederation. Or the name alone may have been adopted, in much the same way as “Scythian” or “Tartar” became generic terms for Central Eurasian nomadic peoples.

The invasions of Europe by Germanic and other peoples are associated with the long decline and collapse of the western Roman Empire, roughly from the third through mid-fifth centuries. The Han fell in 220 CE, and subsequent politically unstable centuries in north China were a period when “barbarian” peoples entered and built states in the old Han territory. Until recently, it was customary to think of these centuries in China, as in Europe after Rome, as a kind of dark age, but this image is exaggerated. For one thing, powers in Byzantium and Persia remained robust, as were some of the north China states, especially the Tuoba or Northern Wei (386–534), which controlled much of north China for more than a century and maintained close connections with Central Asia even while adopting Chinese institutions and fighting off attacks from other nomads.

Indeed, this period was one of innovation and hybridization, as new conquerors and migrants adopted and adapted the institutions of classical societies. Christianity spread and became institutionalized in Europe and Byzantium; in China, former nomad regimes like the Northern Wei actively promoted Buddhism and other aspects of Indian culture, launching a millennium-long insemination of Indian into Sinitic civilization. It was in this period that the cave temples and massive mountainside Buddha carvings in Central Asia and China were constructed or begun: Bamiyan, Kizil, Mogao (Dunhuang), Binglingzi, and Yungang. (Longmen, though stylistically related to these, was carved later, in the seventh and eighth centuries.)

#### The Silk Road

The "decline" and "dark age" paradigms of both European and Chinese history have also led many to assume that the silk road as a whole declined between the third and sixth centuries. But that is true only if we consider contacts between unified Han and the western Roman Empire the only important thing about the silk road. In fact, exchanges on the central reaches of the Eurasian network remained vigorous. In the Tarim basin, largely autonomous oases thrived on agriculture and long-distance trade, much of which was now handled by Soghdian merchants. Indian, Central Asian, and Chinese Buddhist monks translated sutras in monastic centers, including Kucha in the Tarim Basin and Dunhuang on the desert route from China to Central Asia. Kushan kings remained powerful into the mid-third century, after which their place at the Bactrian hub of the silk road was taken by a new tribal confederation, the Hephthalites or White Huns. The Hephthalites contracted Soghdian merchants to bring silk and other luxuries back and forth to Persia, which was now experiencing a golden age under Sasanid rule (224–651). The Sasanids ruled the old Achaemenid and Alexandrian imperial territory in Persia, North India, and north of the Amu Darya (Oxus River) in Transoxiana (Central Asia). Persians thus controlled the nexus of both overland and maritime silk road trade.

#### Medieval cosmopolitanism (sixth–tenth centuries CE)

By the middle of the first millennium, the most active silk-road integrators were speakers of Iranian languages: merchants under the Sasanids dominated sea trade not only around the Persian Gulf but also in the Arabian Sea, along eastern Africa, coastal India and Sri Lanka, and as far as Malaysia and southern China. Persian merchants inhabited designated neighborhoods in Guangzhou (Canton)—then, as now, an export city. Soghdian merchants fanned out overland to Armenia, throughout Central Asia, across north China, and even as far as Manchuria and Korea. Thanks to the prominence of these groups, Persian would become the lingua franca of silk-road commerce and communication, especially along more southward-lying routes, and would remain so even after the Arab conquests of Persia and Central Asia.

From the mid-sixth century, a new nomadic confederation arose north of China. The Turks were an Altaic-speaking people whose tribal elite took power after rebelling against another nomad state for whom they are said to have worked as blacksmiths. (The spread of the name "Turk" itself is a silk-road phenomenon; the modern nation of Turkey takes its name from the medieval Turks coming out of Mongolia but now has a more diverse population. The first Turks looked rather like Mongolians, Kazakhs, and Kyrgyz do today.) The Turks absorbed neighboring tribes who then took on the political and later ethnic moniker "Turk."

Under its eastern and western khanates, Turk rule extended from Mongolia as far south as Bactria, where it displaced the Hephthalites to control silk bound for Sasanian Persia, and westward beyond the Caspian Sea. Turk power fluctuated over time, confederations fragmented, and the Turk khanates ultimately succumbed to the machinations of the Tang Empire. However, Turkic tribes also influenced the Tang dynasty in China, in particular by manning its armies. Even after the khanates' collapse, the westward migrations of Turkic tribes populated

Central Asia with Turkic speakers and led to the formation of several states of great moment to Eurasian history, each of which retained the "Turk" identity and further spread it across Eurasia. These Turk successors included the Uyghur khanate (744–840) in Mongolia and around Turfan, and then a series of powerful regimes providing military muscle and dynastic elites to Persianized Islamic states: the Qarakhanids (999–1211), Ghaznavids (975–1187), Seljuks (1037–1194), Mamluks (1240–1517), Delhi Sultanate (1206–1526), and one could even add the Ottoman (1299–1923), Timurid (1370–c. 1500), and Mughal (1526–1858) dynasties to this broad category of Turko-Iranian Islamic rulers who presided in various territories across the region for nearly a millennium. That so many major states in Central, South, and Southwest Asia shared a common political background and elite culture proved a major factor in silk-road connectivity.

#### The Silk Road

From the seventh to the tenth centuries, another of these Turkic successor states, the Khazar khanate, occupied the North Caucasus and Pontic steppe—a key trade nexus between Black and Caspian Seas, Byzantium, and the Sasanian and later Islamic empires. Furs, honey, and slaves were among the products that came to Byzantium and the Mediterranean from the Volga basin via Khazar territory. The Khazar khans converted to Judaism, possibly influenced by Jewish merchants or exiles fleeing official Zoroastrianism in Persia. The western Turk khanate, too, although its capital was far to the east in the Chu River valley in what is now Kyrgyzstan, enjoyed close diplomatic and commercial relations with the Byzantine court from the mid-sixth century; a Byzantine ambassador to the Turks left a detailed description of the splendor of the western Turk court.

Byzantium engaged with the eastern silk road in order to circumvent Sasanian Persia as a source for silk yarn. Besides working to open direct overland trade with the Turks, Byzantium encouraged Ethiopian merchants to bypass Persia by sea and supply raw silk directly from India. Byzantium developed its

own industry for weaving textiles from imported raw silk, and from the mid-sixth century attempted to develop sericulture to supply its own silk thread. Everywhere across the silk road, fine silks took on extra-economic political value, especially as gifts or tributes between monarchs. This was particularly the case in Byzantium, where sumptuary laws blocked silk exports and limited the finest silks to the imperial family and high ecclesiastics. The most restricted fabrics were those dyed the rich purple known as porphyra, with pigment taken from sea snails harvested at the Phoenician port of Tyre.

China was again reunified in this period, first by the Sui (589–618) and then the Tang dynasty (618–907). Tang stands out in Chinese history, not only for its longevity but for the breadth of its territorial expansion. Tang established agricultural colonies in what is now eastern and northern Xinjiang, and temporary military outposts as far as Iran. The dynasty's close if complex relationship to the Turks and its advance into Central Asia contributed to its cosmopolitanism: the Tang capital Chang'an (modern Xi'an) was home to communities of monks and merchants—Christian, Buddhist, Manichaean, Muslim—from Persia and India as well as Central, Southeast, and Northeast Asia. Chinese taste during the first half of the Tang period embraced objects and culture from the wider world in a manner unprecedented and not to be repeated for several centuries. Tang was also a cultural wellspring for other parts of East Asia, as Han had been before it: aspects of Chinese language, literature, philosophy, music, and political institutions carved a deep imprint on Japan, Korea, and Vietnam. Some of the "Chinese" culture disseminated to East Asia during this period was itself the product of silk-road interactions—the major component is Buddhism, but there are others as well. The tomb of a seventh-century Korean king is designed in the same style as Chinese imperial tombs, with a tumulus mound and approaching "spirit road" flanked by carved stone guards, whose features and dress identify them as Soghdians and Uyghurs. Tang thus conveyed not merely Chinese but also silk-road civilization to other parts of East Asia.

It was also from the seventh century that the Arabs—another nomadic, tribal people—emerged from the desert periphery to conquer much of the Mediterranean and Persian territories of the old Roman and Persian empires. Their expansion was rapid, like Alexander's nine centuries earlier, because they were able to displace an established but crumbling regime: the Sasanians. But the Arabs brought Islam, a potent religious and political ideology, which would have a great impact on the silk road. In particular, after its first dynastic transition, from the Umayyad to the Abbasid Caliphate in 750, Islam extended geographically and ethnically far beyond Arab lands and peoples. The Islamic empire, not surprisingly, absorbed many aspects of Persian political administration and political style, both from Persia and from what Arabs called *Mawarā'n-nahr*, the land beyond the (Amu or Oxus) river, that is, Transoxiana or Soghdia. Despite initial resistance, eastern Persia and Soghdia became integral parts of an ecumenical Islamic world. Indeed, from the ninth to the thirteenth centuries Bukhara was one of Islam's most important artistic and intellectual centers.

In this middle period, then, the Eurasian empires came into direct contact with each other. The Turkic khanate and various Turkic successor states, the Byzantines, and first Sasanian Persians, and then Islamic caliphates shared sometimes violent but commercially active borders and exchanged diplomats and gifts. Tibet, too, became an imperial player, projecting power from its high plateau into the Tarim Basin, Qinghai, western China, and Central Asia, where from the late seventh through the eighth centuries it rivaled the Tang.

This extraordinary constellation of empires brought the Tang, with its mainly Turkic armies, face to face with the Arab, Persian, and Turkic forces of the expanding Islamic empire in Central Asia. The Tang general Ko Sōnji (a Korean) conquered Tashkent, looted the city, and killed the king; the dead king's son sought aid from the Islamic forces then in Samarkand, and Tang and

Abbasid armies met at the Talas (Taraz) River in 751. Tang lost, although the battle was not of great strategic significance. (The Islamicization of Central Asia and the Tarim Basin was a centuries-long process and was not triggered by this incident. Tang was forced to withdraw its troops from Central Asia not because of Talas but because a rebellion in China in 755 led by An Lushan, a half-Soghdian, half-Turkic general, threatened the capital.) Nevertheless, the Battle of Talas looms large in silk-road history because Chinese captives may have introduced papermaking to Samarkand, whence the technology passed through the Islamic lands and eventually to Europe.

### The Mongol world empire (thirteenth–fourteenth centuries)

Genghis Khan (Chinggis Khan, 1162?–1227) has, in the early twenty-first century, been rebranded from bloodthirsty barbarian to something more akin to global visionary. Today's Mongolian nationalists can be forgiven for touting the gathering of the tribes in 1206 that elevated Temüjin into the grand khan Genghis as a consultative, democratic forum, nine years earlier than signing of the Magna Carta. But western writers' crediting him with launching the Renaissance or comparing him to Jesus might give some pause.

Why such a radical rehabilitation? A sentence from a student exam essay suggests the reason: "in 1206, Genghis Khan set forth to globalize the known world." The humor of this sentence may have been inadvertent. But were the Mongols, too, engaged in "connecting cultures, creating trust," as the Smithsonian characterized the significance of silk road?

There is a reason for the Mongols' prior reputation. Temüjin, a charismatic middle son from the Borjigid clan of the Mongol tribe, became khan only after conquering several other tribes competing for supremacy in Mongolia. After centralizing and reorganizing

tribal society; Temujin—now Genghis Khan—embarked on a twenty-year career of conquest in north China and Central Asia. His sons and grandsons eventually expanded the lands under Mongol rule to take in the rest of China, Tibet, Iran, Iraq, and much of Russia, creating a quadrupartite empire consisting of the Yuan in China and Tibet; the Chaghatai khanate in Central Asia; the Il-khanate in Persia and parts of Southwest Asia; and the Golden Horde (Qipchak khanate) on the steppe north of the Black Sea and along the Volga, which exercised overlordship over Kiev and Moscow.

Like other powers before and since, the Mongols used extreme violence for strategic purposes and did not hesitate to raze cities and slaughter populations to set an example for the next city along the way, especially during their early campaigns in Central Asia. Osama bin Laden knew his listeners would get the point when he compared U.S. vice president Dick Cheney to Genghis's grandson Hulagu: the latter is infamous in the Islamic world for executing the caliph, destroying irrigation infrastructure, and sacking Baghdad for seventeen days: the Tigris River first ran black with ink from the city's famed libraries, and then red with blood.

And yet, despite Mongol violence, in a real sense the Mongol Empire unified Eurasia as never before. This unity did not last long. Central Asia was ridden with Mongol internecine strife, and Mongol regimes collapsed in China and Southwest Asia by the mid-fourteenth century; the Golden Horde fragmented early in the fifteenth, with only small successor khanates surviving after 1500. At the empire's height, however, the lands under Mongol rule were linked by familial ties among rulers, a system of mounted communications for official correspondence (the *yam*), shared administrative, legal, taxation, and financial institutions, and a practice of dispatching technocrats and skilled artisans from one part of the realm to the other, especially between the Yuan and Il-khanate, whose relations remained friendly throughout the Mongol period. Relative security made

the steppe route from China to the Black Sea ports, and thence to Europe, an economically viable alternative to routes through the Islamic lands: Chinese silk textiles were available in the fairs of Champagne in 1257 for less than the price of silks manufactured in Persia. Just as the Crusades taught northern and western Europe about the Islamic world, the Mongol Empire opened Central Asia and China to European missionaries and merchants. Of the western merchants who during the Mongol period traveled all the way to Cathay, as they called it, the only one who wrote about it was Marco Polo. His geography of Asia, spiced up by the Italian romance-writer to whom he dictated his recollections in a Genoese jail in 1298, proved to be not only a window on the East but also a goad to further exploration: Columbus brought his personally annotated copy of Marco Polo's *Travels* when he sailed for what he thought would be Cathay.

## Enclosure of the steppe (sixteenth–nineteenth centuries)

Because the Mongol Empire facilitated Eurasian connections to an unprecedented extent, to some scholars that period marks the beginnings of the modern world. Without going quite so far, it is nonetheless clear that besides intensifying silk road exchanges, the Mongols left a deep impression on the politics and society of Eurasia. Subsequent rulers over steppe and sown were indebted to Mongol tradition militarily, administratively, and in aspects of imperial style. In particular, the Mongols created a hybrid of nomadic and sedentary regimes by going beyond the extractive approach of earlier nomadic empires to rely on systematic taxation rather than only on loot and tribute in agrarian areas. Post-Mongol successor states followed this model.

Royal legitimacy in much of the territories formerly under Mongol rule for centuries afterward hinged on descent from Genghis Khan: only Chinggisids, or descendants of Genghis (Chinggis), could use the title "khan." Timur or Tamerlane (r. 1370–1405), who

## Chapter 4

# The technological silk road

Koreans are impressive mountain climbers. Even elderly hikers move fast, heedless of steep rocky terrain or enervating humidity, and seldom stop. They are also professionally outfitted, even on a Sunday excursion to Mt. Bukhansan in Seoul: besides ubiquitous sun visors and bandannas imprinted with maps of mountain temple itineraries, many Korean hikers sport Gore-tex® boots, microfibre quick-dry clothing, ultralight backpacks, CamelBak hydration systems, and retractable molybdenum walking sticks. When they do pause, for lunch, they spread out dish after dish of spiced meats, grilled fish, and multiple vegetable kimchis, all washed down with little green bottles of *soju*—a sweet indigenous vodka. While eating, many sit comfortably on compact folding stools: two rectangles of metal tubing bolted together and pivoting in the middle, a fabric seat stretched across one end.

This kind of camp stool—a classic design, reworked by Koreans in aircraft aluminum—probably originated in North Africa and passed through Central Asia, arriving in China around the second century CE, where it was named, significantly, *huchuang*: “barbarian chair.” The *huchuang* was known in Asia from the classical era, but it remained a specialty item, since East Asians did not sit on chairs. The ancient Chinese term we translate as “chairman” when we speak of *Chairman* Mao—Mao *zhuzi*—literally means “master of the *mai*,” since that’s what

ancient Chinese sat upon in formal settings. All of which shows that even the most quotidian of “technologies” can have a cross-continental history.

Ancient China was of course technologically capable of making chairs, but it was not until the late tenth and early eleventh century that fixed-frame chairs—with hard platform, back, and sides—became common in Chinese interiors. Before that, the earliest references to chairs in China are Buddhist, first in the representation of seated deities (such as at the Longmen, Yungang, and Dunhuang caves), and then in written advice for monks (meditating on chairs kept them safe from snakes and insects). From there, chairs and thrones were taken up in Chinese courts and only later moved down the social ladder to commoner households. It was thus the centuries of communication between India and China, linked to the spread of Buddhism, that brought the chair to China and encouraged its acceptance as a common household item.

There have been several epochs and axes of intensified communication in silk-road history. The connection between India and China, starting in the first century CE and attenuating only from the mid-ninth century, brought not only Buddhism but also many non-religious ideas and items. For example, in addition to the chair, China adopted, from India, by imperial decree, the technique for producing refined sugar from cane. The explosion of Arab armies out of Arabia in the seventh century and creation of an Islamic empire and zone of cultural influence led to similarly intensified contacts and exchange over much of the middle of the continent. Between the eleventh and thirteenth centuries, the Crusades put Western Europe back in touch with the southern Mediterranean and Persia and led to the reintroduction of classical knowledge, enhanced by Islamic learning, to Europe. The Mongol unification of Eurasia from Korea to Hungary spread military technology as well as aspects of mathematics, astronomy, cartography, agronomy, and other arts and technologies in both directions across the continent.

The silk road owes much to such episodes, and despite its prevalent image as a peaceful highway, these intensified communications arose from war and imperial conquest. Even the Sino-Indian connection, though ostensibly in the hands of Buddhist monks, benefited from Chinese military expansion into Central Asia during the Han and Tang dynastic periods as well as imperial sponsorship of envoys and translation projects. This should not surprise us: the most profound technological exchange of modern times, industrialization, was driven not only by individuals or the market but by states with strategic concerns. This remains true for many new technologies today.

## Warp and weft of the silk road

Like horses, silkworms have been domesticated for millennia. Like horses, silk is a product closely associated with Eurasian elites. And as a pair, silk and horses made up one of the most common exchanges on the silk road. In early centuries, Chinese silk fabrics were shipped from east to west, but a longer-lived and ultimately more significant exchange was that of silk (and other) textiles south to north between agrarian and pastoral economies. Horses and silk represent the essence of steppe and sown, the former embodying the martial strength of the Central Eurasian nomads, the latter symbolizing the soft, sensual life of the urbanized elites of Eurasian rimlands. The agrarian lands' need for transport and cavalry mounts was complemented by the nomads' demand for textiles, especially fine silks, which could confer legitimacy and status, and help nomad elites secure their followers' support or be resold for a profit. This contrast and complementarity was a key driver of silk-road history.

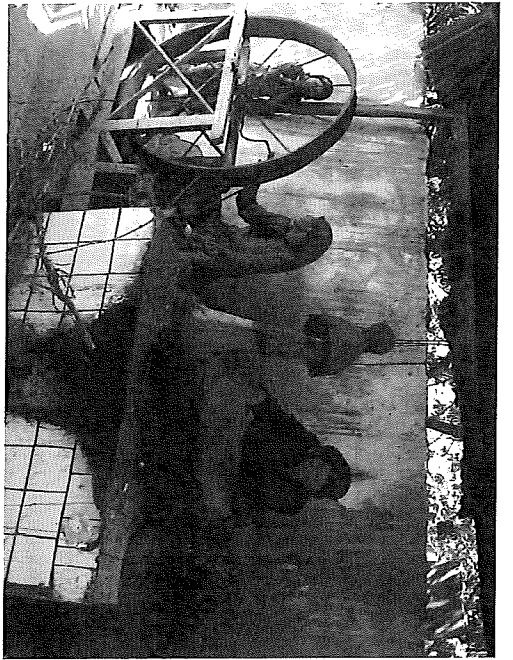
The human relationship with silk is intimate, domestic, and feminized. Legend attributes the invention of sericulture to Xi Ling, wife of the mythological Chinese progenitor, the Yellow Emperor. (She supposedly lived in the mid-third millennium BCE, though silkworm cocoons have been found dating from 5000

to 4000 BCE). After accidentally dropping a cocoon into a cup of hot tea, Xi Ling realized that she could unwind it into a long continuous strand. In another story, it was a Chinese princess who, in order to assure herself a supply of silk after her marriage to a Central Asian king, smuggled silkworm eggs and mulberry seeds to Khotan in the first century CE by wrapping them in her headdress. A millennium after that, we are told, Italian women were incubating silkworm eggs in bags nestled between their breasts.

Humans have long intervened directly in the reproduction of the silk moth, *Bombyx mori*, which no longer lives in the wild; nor have the fundamentals of silk production changed much since ancient times. After lovingly guarding and hatching the tiny silkworm eggs (35,000 to the ounce), silk-raising families east and west would light braziers or move out to the barn, yielding their warm houses to larvae in wicker trays in order to protect them from the chill of early spring. Today eggs and larvae are still incubated and fed in trays. *Bombyx mori* larvae voraciously consume the leaves of just one species of mulberry; it takes some two hundred pounds of leaves to produce a pound of silk. Careful sericulturists supply the caterpillars with leaves day and night for around five weeks until they are almost 3 inches (7–8 cm) long. The caterpillars then spin silk through glands on their heads, which combine fibroin, a protein, with sericin, a gum. Gyrating their heads in a figure-eight motion, the caterpillars wrap themselves into a cocoon wound from a single, strong thread up to 4,000 feet (1,200 m) in length. Throughout this entire period, traditional silk-raising families tended their tiny charges like new parents, avoiding loud noises, keeping them well fed, and clearing waste from the trays. Superstitions once attended this delicate stage in the process: in China, for example, menstruating women were not to enter rooms where the worms were feeding.

Once the cocoons are spun, however, the nurturing is over: before they can emerge as moths, the caterpillars are swiftly killed in their





6. Women in Khotan demonstrate the traditional method of spinning silk. Boiling cocoons in water loosens the strands, which are then spun together into a thicker fiber that can be dyed and woven.

cocoons by steaming or, traditionally, by immersion in boiling water. As the heat dissolves its gum, the end of a filament can be located and unwound. Filaments of five to seven cocoons are spun together to make a thread. Textiles woven from such thread are soft, strong, and easily dyed with more brilliant colors than woolen or vegetable fibers can hold. Silk can be woven into sheer gauze, as were the silks first favored by the Romans, or into heavy patterned damasks.

Ancient Greeks and Romans understood silk to come from a land and people called *Seres*—the source of which term, linguists have recently argued, is none other than the Chinese word for silk (today pronounced *sì*) as filtered through Central Eurasian languages. But even though they wore and coveted the fabric, the Romans did not understand the technology behind it. Virgil

in his *Georgics* (first century BCE) reflected the common belief that silk thread was combed from leaves; around the same time, the Greek geographer Strabo said that silk was the dried bark of certain trees found in India. A century later, Pliny the Elder still described the silk of the *Seres* as “the wool that is found in their forests.” The *Seres*, or Chinese, soaked it, combed off its down, and “then to the females of our part of the world they give the twofold task of unravelling their textures and of weaving the threads afresh. So manifold is the labour, and so distant are the regions which are thus ransacked to supply a dress through which our ladies may in public display their charms.” It seems that Roman women would modify imported silk fabrics, either by loosening the weave or refashioning it into some kind of lace. Thus, regarding Cleopatra, the Roman poet Lucan wrote that “her white breasts are resplendent through the Sidonian fabric, which, wrought in close texture by the sley of the *Seres*, the needle of the workman of the Nile has separated, and has loosened the warp by stretching out the web.”

Pliny railed against both the transparency and the expense of such textiles. In this he was joined by the philosopher Seneca, who is said to have lamented:

I see, too, silken clothing—if clothing that can be called, which does not protect, nor even conceal the body—apparelled in which, a woman cannot very truly swear that she is not naked. Such tissues are brought to us at enormous cost, from nations so remote that not even their names can reach us; and by the help of this vast expense, our matrons are able to exhibit, to their lovers and in their couches, nothing at which the whole public has not equally gazed.

Such a fuss over caterpillar spit! Yet these eruptions of conservative commentators tell us something: silk was new to the Roman empire, its use just then passing from the ruling echelon to a somewhat broader, though still elite, stratum of society. Tiny fragments dating from centuries earlier have been found in

northern European sites, but it was not until the last century BCE and first century CE that silk was known and increasingly available in Rome—at this point still traveling all the way from China.

It is wrong to say that Zhang Qian inaugurated the silk road—as we have seen, trans-Eurasian exchanges go back millennia before that. But his trip to Central Asia in search of anti-Xiongnu allies (ca. 129 BCE) did result in an accelerated marketing of Chinese silk in Central Asia, whence it was traded on by way of Bactria (Kushan empire), India, and Parthia. Some, ultimately, ended up in Rome. It was not primarily as a consumer product that Chinese silk moved west, however, but rather as an instrument of imperial policy. The Han empire in these centuries was shipping enormous amounts of silk north to appease the Xiongnu and buy their horses. On a later embassy to a nomadic people known as the Wusun in northern Xinjiang, Zhang Qian brought gold and silk goods worth 100 million *cash* (a Chinese currency unit). Subsequent Han embassies to other Central Asian lands, dispatched to secure big western horses, involved hundreds of people, many of whom, Sima Qian sniffs in his *Shiji*, were

sons of poor families who handled the government gifts and goods that were entrusted to them as though they were private property and looked for opportunities to buy goods at a cheap price in the foreign countries and make a profit on their return to China.

This simply means that besides official exchange of diplomatic gifts, there was trading on the side, to the irritation of Chinese chroniclers. The next Chinese state to operate extensively in Central Asia, the Tang, likewise used its comparative advantage in silk production for strategic purposes. Tang supported its administration in “the Western Regions” (modern Xinjiang) largely with shipments of silk piece goods—up to 900,000 bolts a year, which were used as currency. Over the years, it delivered hundreds of thousands of bolts of silk to Turks and Uyghurs in what is now Mongolia.

China did not retain its monopoly on all aspects of silk textile manufacturing. Inhabitants of the Tarim Basin understood basic sericultural techniques by the first century CE. Some scholars believe that India was manufacturing silk by the third century CE. Byzantium had silkworms (allegedly smuggled from China in a bamboo pole by Nestorian monks) by around 550 and launched its own silk textiles industry under state monopoly during the reign of Emperor Justinian I (r. 527–565), even while continuing to purchase silk from Egypt and Sasanid Persia. Silkworm cultivation spread to Sicily in the twelfth century and onto the Italian peninsula by the thirteenth century.

Even before then, though, the character of the transcontinental silk trade had changed. By the sixth century, it was not piece goods but silk floss (thread) that was being sold on the east–west continental and sea routes via India. It was woven in the Mediterranean world (for example, in Damascus, hence the word “damask”) to match local taste; the best pieces were stained purple with a dye produced from the shells of a Mediterranean mollusk in the Phoenician ports of Sidon and Tyre (modern Lebanon).

Although in later centuries the long-distance east–west silk trade involved fewer piece goods, and the technology of sericulture diffused to most southern parts of Eurasia where the climate could support it, the north–south exchange of silk and other textiles for horses long remained a fundamental economic and strategic dynamic between the steppe and settled agrarian lands. In the eighteenth century, for example, the Mughal Empire was importing as many as 50,000 horses annually from the Central Asian steppes and from Iran to support its cavalry. Indian merchants traded dyes and textiles, primarily cottons from the advanced Indian textile industry, for the Central Asian horses. Many of the Indian products were re-traded in Bukhara and other Central Asian cities, winding up in Russian hands as the Russian empire expanded eastward. This Indian–Central Asian–Russian

trade of textiles for horses continued until the nineteenth century, when the British undermined India's textile industry.

And in China, too, the textile-for-horse trade continued through Tang, Song, and Ming dynasties, increasingly supplemented by tea sales as this beverage became a necessity for nomad herdsmen and as Russians, too, developed a taste for it. In the late eighteenth and nineteenth centuries, the Qing Empire launched another massive exchange of silks and cottons with the Kazakhs. Qing imperial officials in northern Xinjiang traded silk from southern China for steppe horses and cotton cloth from southern Xinjiang for sheep and cattle. From 1759 to 1853, the Qing shipped nearly 420,000 bolts of imperial silk from south China to Central Asia. The textile-for-horse trade, the warp and weft of the silk road, extended into modern times.

### Silk road or paper route?

Today, as newspapers become digital, millions read "the paper" on small electronic devices; these devices also help us communicate, navigate by map and compass, record and display music and images, read literature, predict astronomical events, perform mathematical calculations, learn market prices, or translate foreign languages. Anyone alive in the late twentieth century and early twenty-first century understands the transformative quality of such technology. Likewise, while silk is the most glamorous silk-road product, paper has had the most impact, since it first revolutionized most of the activities we now do with smartphones. And you can wrap fish and chips in it too.

Paper consists of vegetable fibers that have been beaten and suspended in water and dried on a screen into a felted sheet. Like many things, it was first invented in China, where credit is traditionally given to Cai Lun in the second century CE. Examples have been found, however, from as early as the first century BCE. It was probably first used to wrap things, and only later for writing

on (it replaced bamboo strips and supplemented silk textiles and carved tablets for this purpose). But this flexible and strong material was also put to other uses, including as clothing, hats, shoes, armor, kites, as well as one nonliterary purpose still familiar today: a sixth-century Chinese scholar admonished his family not to use scraps of paper inscribed with the classics in the toilet—which demonstrates how inexpensive paper was by that time. (The same issue arose in China during the Cultural Revolution of the 1960s and 1970s: the ubiquity of the words of "master of the mat" Mao made it hard to put old newspapers to an accustomed purpose.)

Buddhism and the Chinese civil service examination system (which relies on candidates' knowledge of the Chinese classics) helped spread paper use to neighboring lands. Korea and Vietnam adopted paper in the first centuries CE; a Korean monk is credited with introducing papermaking to Japan in 610. By then, paper was being made in Karakhoja (Gaochang), but archeologists, including Aurel Stein and Sven Hedin, have unearthed paper documents in Xinjiang dating from centuries earlier. Some are official or commercial records. The Soghdian letters were on paper, including the one describing the fourth-century Xiongnu attacks. Many other paper records, including the earliest printed books and other items from the Dunhuang library cave, concern Buddhism. Oddly, though Chinese missionaries brought paper to India, its use did not catch on there until the twelfth century, after Buddhism's decline in India. Perhaps the humid climate and teeming insect life made paper too ephemeral a medium for religious texts, although later Indo-Islamic texts would indeed use paper.

The Battle of Talas, in which Tang met Arab forces in 751, is reported in a later Arabic source to have been the catalyst for the spread of paper to the Islamic world. Tha'alibi's eleventh-century *Book of Curious and Entertaining Information* records that craftsmen among the Chinese taken captive in that battle opened the first paper mills in Samarkand. Although paper was probably

known and made in Transoxiana decades before the Battle of Talas, Samarkand was the first place in the new Islamic world to develop papermaking technology and became famous for its paper exports. Thereafter, paper spread remarkably quickly throughout the lands under the command of the Abbasid caliphate. It is said that Caliph Harun al-Rashid established a paper mill in the capital, Baghdad, in 794/95, to supply paper for his growing bureaucracy. Over the next two centuries, papermaking spread to Syria, Egypt, North Africa, and Spain. Europe learned of paper at this time and imported it from Arab lands, but the first manufacture of paper in Europe was not until the twelfth (Spain) and thirteenth centuries (Italy).

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This paper-gap between medieval Christendom and the Islamicate reflects and contributed to differentials in learning and scholarship. The burgeoning production and circulation of books and maps of all sorts in the Islamic world corresponds to the new prevalence of paper from the ninth century. Paper thus spurred scholarship based on the Greco-Roman tradition and Islamic science, but it also had a popular dimension: the earliest extant text of *One Thousand and One Nights* was copied on paper in Egypt or Syria in the ninth century—which suggests that this book, in a relatively inexpensive edition, was to some degree available to common folk. By contrast, even centuries later, the greatest libraries of Europe could boast only a few hundred books in their collections, all on very expensive parchment or vellum (both processed animal skin), and many of them, like those in the Sorbonne, chained to desks.

Of course, what truly disseminated the written word—with revolutionary results, especially in the European Renaissance—was a combination of technologies: paper with mechanical printing. Gutenberg's movable type, with which he produced multiple copies of his Vulgate Bible in 1463–1465, is the well-known European milestone. Like paper, printing technology began in East Asia, where both block printing and movable type

were known centuries earlier. Developed on many technological precedents (seals, rubbings, printing on textiles), block printing on paper began around 700 CE in China, and both of the earliest extant examples there are Buddhist: a charm scroll from the early eighth century CE, and the earliest book, a block-printed Diamond Sutra scroll from 868 CE, found at Dunhuang and now in the British Library. It may be that the belief that karma could be accrued by repetition of prayers or copying of sutras stimulated the development of mechanical mass-production methods.

Movable type was invented in China in the mid-eleventh century, and the earliest movable metal type developed two centuries later in Korea—still earlier than Gutenberg. The earliest extant book printed with movable type is Korean (the *Jijŏi*, a Zen Buddhist primer printed in 1377), but movable type remained of secondary importance in China and East Asia generally. Early movable type could be helpful for printing alphabetic or syllabary scripts, where one needs many of a limited number of different letters. Thus movable type was used for the Uyghur language in an old script derived from Soghdian around 1300. However, the Chinese script, used in China, Japan, Korea, and Vietnam, contains tens of thousands of individual characters, some used frequently, others hardly at all—with the frequencies varying greatly depending on the subject matter of the text. A set of movable type would have to be enormous and still would not fit all needs. It was much more efficient to carve a block in negative—which could print two pages—than to cast, set, and reset pages with thousands of different characters of movable type. Woodblocks also had the advantage of simplifying the integration of text and image on a single page.

Is printing an example of diffusion or convergence? It is not clear whether Gutenberg was inspired by Asian examples when he developed his typographical system. There is a story that his wife, from a Venetian family, had seen Chinese woodblocks at home. On the other hand, Gutenberg combined elements of his

technique (ink, ink-pad, type, press) in a unique way. What is without doubt is the travel before Gutenberg's day of printing and printed items over the silk roads from China through the Islamic world and into Europe. The Mongols were instrumental in bringing printed things westward. They adopted a Chinese practice by printing paper money in their domains in Persia in the late thirteenth century. Playing cards are another example. Printed to allow production in quantity, playing cards were first used in China in the ninth century and appeared across the Islamic world over subsequent centuries. By the fourteenth century there are references to them in Europe, where they were possibly brought by the Mongols. Printed religious pictures share a similar timeline and entry point (to Spain and Italy from the Islamic world and to Germany, perhaps due to Mongol activity in Eastern Europe.) In general, the long-distance travel that the Mongol empire facilitated let European missionaries and merchants examine and acquire printed items and write about them in their accounts. Whether the momentous development of European printing arose from a heroic invention, or whether there was a "Chinese background for the European invention of typography" depends largely on one's definition of "invention" and, as for pasta, on the nationality printed on one's passport.

## Medicine

Many have noted that in China, medicine and food are not considered separate categories but rather lie along a continuum of things one ingests that have effects on the body. This is often treated as evidence that the traditional Chinese approach to health is more "holistic" than that of modern medicine. Likewise, the philosophy behind traditional Indian Ayurvedic medicine stresses nutrition and consumption of certain foodstuffs to restore "balance" and health. In both traditions, certain foods, though not always the same ones, are understood to be "heating" or "cooling," "wet" or "dry," regardless of physical temperature or juiciness. Flavors and types of food eaten together should be calibrated not

just to enhance enjoyment but to ensure the healthiness of the meal. In India, for example, a thin-framed, energetic person whose component parts are dominated by *vata*, a "humor" or *dosha* made up of air and ether, might be cautioned that eating dal (beans) will lead to considerable flatulence. In China, if one is feverish, pears (cooling) are advised, while mandarin oranges or ginger (heating) are not; meats and rich stews are good for sickly people or in cold weather, but one should never eat dog meat (highly warming, especially when cooked with garlic and hot chiles) in the summer months.

We often point to such practices, a combination of traditional textual knowledge and evolving folklore, to distinguish "eastern" from "western" medicine. In fact, however, what they really show us are vestiges of an older, pan-Eurasian medical theory current even in the West until the nineteenth century; it was only then that new discoveries and empirical practices really began to create the body of knowledge that we now know and practice globally as modern medicine.

The idea that foods fall into certain categories based on their "humors" and how they affect the body is shared by ancient Greco-Roman, Indian, Chinese, and Islamic medical traditions. Each tradition has unique indigenous features, but they all express one version or another of what is often called the "humoral theory" regarding the composition and proper functioning of the body. The western version of this scheme derives from the work of Hippocrates, later elaborated on by the second-century physician Galen. Here, the four humors are understood to be fluids in the body (black bile, yellow bile, blood, and phlegm), associated with the four "elements" (earth, fire, air, water), seasons (autumn, summer, spring, winter), psychological temperaments (melancholic, choleric, sanguine, phlegmatic), bodily organs (spleen, gall bladder, liver, brain/lungs), and various permutations of the qualities hot, cold, dry, and wet. That there is a relationship between this Galenic and Indian humoral theory seems clear, but

the exact mechanism of transmission—and even the direction of transmission—remains controversial. Nevertheless, contacts between the Mediterranean and the Hellenic city-states in Central Asia likely played a role.

As for China, *The Yellow Emperor's Classic of Medicine* from the Han dynasty (206 BCE–220 CE) contains no humoral theory, but by the fifth century CE Chinese medical texts discuss illness as the result of corporal imbalances of heat, coolness, wetness, and dryness, and point out which foods contain these qualities. Buddhism, as so often, seems to have been the medium bringing these ideas from India to China. Chinese Buddhist writings on natural philosophy describe the body as comprised of four elements: earth, water, fire, and air—imbalances of which were understood to cause illness. Demons, too, made people sick, as could bad behavior in previous lifetimes—ideas also imported from India. These concepts coexisted with China's own theories involving not “four elements” but “five phases” (wood, fire, earth, metal, and water), that correspond in turn to five flavors (sour, bitter, sweet, pungent, salty), the five senses, and two sets of organs. In the great eighteenth-century Chinese novel *A Dream of Red Mansions/Story of the Stone*, characters fall ill due to demon possession, bad karma, or obsessive thoughts and are treated according to the humoral system. Popular belief in China had thus absorbed Indian medical ideas and reconciled them to ancient indigenous ones, at least as far as the question of balance of humors is concerned. In China today, the notion of “heating” or “cooling” foods remains current. When someone urges you to eat duck broth or lotus seeds and avoid donkey-meat burgers in the summer, the underlying logic of their suggestion is both thoroughly Chinese and a product of silk-road interactions linked ultimately to ancient Greece.

The humoral theory reached northern and western parts of Europe later than it entered China and, as with many other aspects of the classical Mediterranean tradition, did so only after a silk-road

sojourn. The Abbasid caliphate, whose capital, Baghdad, was one of the largest and most cultured cities in the world, actively supported preservation and translation of Greek philosophical and scientific texts, including medical works by Galen. Just as the monk Xuanzang learned Sanskrit and traveled to India to gather Buddhist scripture, the ninth-century Arab scholar Hunayn Ibn Ishag, a Nestorian Christian, learned Greek and went to Byzantium to collect medical texts, including more than a hundred of Galen's treatises. Hunayn was a master translator, rendering these and other works into Syriac and Arabic (some of Galen's writing survived only in Hunayn's translations), thereby laying the foundations for centuries of medical writing in the Islamic world, including that by the Bukharan scholar Ibn Sina, known as Avicenna in Latin. Ibn Sina's *Canon on Medicine*, a synthesis of Islamic and Greek medical learning, was the backbone of the corpus of translated and new medical works that entered Europe from the mid-eleventh century. They passed first through the Italian city of Salerno; there scholars in touch with Byzantium studied the Galenic tradition along with Aristotle and other classical works via the efforts of another translator, Constantine the African. (How critical to world history has been the work of linguists!) The humoral theory and other medical knowledge thus came from classical Greece and Rome to late medieval Europe via Byzantium, Baghdad, Bukhara, and other silk road information entrepôts.

In a way, humoral theory “works”: it sometimes correctly identifies the nutritional value of certain foods and their appropriateness for certain conditions. But there is another truly effective medical technique in which the silk road played a role in both invention and dissemination. Smallpox (variola) is one of the deadliest diseases to have originated on the Eurasian continent, probably from a rodent virus that jumped species. The disease afflicted people in Egypt and India from the second millennium BCE, whence it spread elsewhere on the continent, scarring and blinding those victims it did not kill. As a “crowd disease,” it was

endemic in many densely populated areas, where its mortality rate was close to 30 percent, striking children particularly hard. Those who survived outbreaks, however, were immune for life. Adults in cities and agricultural areas, therefore, were likely to have been exposed to and survived the disease and to have at least some immunity to it. The same was not true, however, for Central Eurasian nomads, whose sparse population and infrequent contact with settled areas meant that most adults had never encountered the disease. Towns and cities, therefore, could be deadly for even the fiercest nomad conquerors.

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Possibly for this reason, the first systematic governmental efforts at inoculation to protect against smallpox (by introducing a form of live virus into healthy people) occurred in states with roots on the Eurasian steppes: the Ottoman and Qing empires. The disease was definitively identified as a distinct condition around 500 CE in China, and by Al-Razi in the Islamic world four centuries later (Galen had not noted it). There are some suggestions of inoculation in India in the first or second millennium BCE, but the first clear use is in tenth-century CE China; thereafter it seems that the Chinese practiced various approaches to inoculation (deliberately introducing live virus to stimulate immunity), until by the sixteenth century it was a well-known, if still rather dangerous technique. Versions of the practice were also found in Central Asia and Africa after this period, due either to transmission from China or independent invention. We know that there was a great interchange of medical personnel and information between China and Persia under the Mongol empire.

For the Manchu rulers of China during the Qing dynasty (1636–1911), smallpox posed a political as well as medical challenge. The Manchu military was comprised of tribal Manchus and Mongol allies; the court promoted close diplomatic relations with Mongol princes and the high lamas of Tibet, who were all hesitant to come to the Qing capital of Beijing, lest they contract smallpox. Indeed, the Third Panchen Lama died of the disease

following a state visit in 1780. Most important, the Manchu imperial clan itself suffered from the disease. China's longest-lived ruler, the Manchu Kangxi emperor (r. 1661–1722), was chosen as heir and enthroned at a young age in part because he had survived smallpox—which may have been the cause of his father's death. Kangxi developed an inquisitive, eclectic, and empirical mind, and personally experimented in the 1680s with various techniques to safely inoculate his own children as well as elites among the Mongolian units loyal to the Qing. Although the most common Chinese method employed live virus (from powdered pustule scabs), it used scabs only from inoculated people or from those infected by a milder variant of the disease (*V. minor*) rather than those with full-blown smallpox, and did so only after storing the material in a controlled environment for some time. These tricks attenuated the virus, lowering the risk of infection to acceptable levels.

At the other end of Eurasia, a more direct form of inoculation was commonly practiced in the Ottoman empire. The wife of the British ambassador, Lady Mary Wortley Montagu, learned of the technique in Istanbul in 1716–18, inoculated her own family and vocally advocated use of the method in Britain. In a process reflecting the same empirical habit of mind exhibited by the Kangxi emperor but in a public context characteristic of the European Enlightenment, information about inoculation was then propagated through scientific journals of the Royal Society. Experimentation began in the 1720s on prisoners in Newgate prison and on colonials in Boston, and inoculation eventually gained broad acceptance. In 1796 William Jenner discovered the method of vaccination, using cowpox virus, that afforded humans some immunity with no risk of contracting smallpox.

Following a global campaign to modernize and universalize smallpox immunization, the World Health Organization declared the disease eradicated in 1979. This is one of the foremost success stories of twentieth-century international collaboration in public health. But these global efforts had begun much earlier, albeit in a



less coordinated fashion, with the emergence and communication of inoculation methods across Eurasia.

## Military technology

One of the last outbreaks of smallpox occurred in the port town of Aralsk, in Kazakhstan in the heart of Central Eurasia. The Soviet Union maintained a secret biological weapons facility on Vozrozhdeniye Island in the Aral Sea, and in 1971 a test of aerosolized smallpox worked a little too well: it blew shoreward and infected ten people, three of whom died, and prompted a massive, if secret, immunization campaign. The accident, when finally revealed in 2002, heightened fears that terrorists in the post-Soviet era would obtain similar weaponized variola or other diseases.

Among the greatest concerns of our time is the spread of biological, chemical, or nuclear weapons to other entities besides those powers that already possess them. But if history is any guide, this is a losing battle: few things have diffused as readily and pervasively as new military technology. The incentives for any power to adopt—and negative incentives against not adopting—effective weapons are simply too great. The most prominent example from our time has been, of course, atomic and thermonuclear weapons, which have spread through a combination of direct diffusion of technology (through espionage and technology transfer) and by “stimulus diffusion”—the independent invention by one group on the basis of a concept observed among another, rather than direct import of the thing itself.

After the United States developed and first used nuclear devices in 1945, the Soviet Union tested a nuclear weapon in 1949 (in Semipalatinsk, in Central Asia); Britain and France followed in subsequent years. In what may be one of the most significant “silk road” transfers ever, from 1950 to 1960—the decade of warm relations between the USSR and China—Soviet advisors provided

Chinese nuclear scientists with atomic research facilities, an experimental reactor, a cyclotron, elements of a gaseous diffusion plant, and other technological and financial assistance. Besides socialist fraternity, one factor motivating this aid was the Soviet shortage of uranium, which China had in abundance in mines in Xinjiang. The USSR had packed up a sample atomic bomb with full documentation in 1957 and was about to ship it to the PRC when relations cooled, and the USSR abrogated the transfer agreement. Nevertheless, Chinese scientists went on to develop and test an atomic bomb by 1964 (again in Central Asia, at the Lop Nor site in Xinjiang: the old silk road has been the preferred testing-ground for horrific modern weapons).

Eurasian transfers of military technology are nothing new. It was the diffusion of the equestrian military complex that shaped the linguistic map of the continent and underpinned the unique, long-running military-political system of the nomad states. This began with the domestication of the horse and its use for riding (4200–4000 BCE), along with wheeled ox- or donkey-carts introduced from Mesopotamia, which made deep-steppe nomadism possible (3300 BCE). The next critical technology was the war chariot, developed not in the Near East as was once thought but in Central Eurasia. The earliest chariot burials date from 2100 BCE in the Sintashta and Petrovka sites on the steppes east of the southern Urals, where they are associated with intensive bronze metallurgy.

The chariot is not a cart, as it has only two light, spoked wheels on a single axle, and a cab designed to carry only one or at most three standing riders. It took great skill and much practice to drive two or four horses at speed in such a light vehicle, while firing arrows or hurling javelins at an opponent at the same time. It required heavy investments in metals (bronze) and other hardware to equip an army with chariots. These inputs of time and wealth, as well as the weapons and fine grave goods accompanying chariot burials, show that the steppe societies producing and deploying chariots were stratified, with power centralized in elite hands.



The chariot was a game-changing technology in other ways as well, arguably as significant as gunpowder would be later. The age of the chariot corresponds to the second millennium BCE, waves of migrations and invasions of Indo-European speakers from northern and central Eurasia into the riplands: the Hittites into Anatolia, Syria, and upper Mesopotamia; the Mycenaean into the Greek peninsula; the so-called Aryans into Persia and India. The Hyksos, who were not Indo-European speakers, invaded Egypt with chariots around the same time. The chariot shows up suddenly, with no technological predecessors, in tombs from Shang China around 1200 BCE. Two centuries later, the Zhou, a people from the northwest with more access to horses, used massed chariots to overcome the Shang. Ancient elites across Eurasia, then, used chariots in military or symbolic ways: the Norse, Greco-Roman, Persian, and Indian gods all ride chariots.

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The technical features of chariots and harness systems identified in archeological sites make it clear that these chariots across the continent share a common source. It is a case of diffusion that contributed to demographic shifts and political upheavals, helping to draw the map of the ancient world and permit the broad spread of Indo-European languages across the continent.

And yet, the chariot's day was relatively short. By the time of the Roman chariot races, or when chariots were buried with the first emperor of Qin or carved in relief in Han tombs, they were mere icons of power. Even when Homer described the chariot warfare on the plains of Troy, he was singing of warfare long obsolete. Chariots could be effectively challenged by infantry in hoplite formation, and proved no match for fast cavalry of mounted archers armed with the short compound bow. And with the invention and spread across Eurasia of the stirrup (from China, in the first centuries CE, with Indian and Kushani precedents), the archer sat all the more firmly in the saddle.

After the dissemination of the stirrup, the next highpoint of military technology transfer occurred, like so many other

exchanges, during the Mongol period. To resolve a stalemated siege of southern Chinese cities in 1268, the Mongols brought in Persian siege engineers, who built versions of the European counterweight trebuchet (a kind of catapult) to bombard the cities. The Chinese called these "Muslim bombardiers," but to the Persian historian Rashid al-Din they were "Frankish" (that is, European) trebuchets. Such weapons had come to the Levant only decades before and had proved decisive at the Crusaders' siege of Acre in 1191.

Going the other way, at around the same time, was a momentous military technology: gunpowder and various kinds of guns. Gunpowder was a Chinese invention; an early formulation is described in a Daoist text from 850 CE. The early mixtures of sulfur and saltpeter with carboniferous substances (including honey) were, by the eleventh century, refined into powder that would explode, not just burn. Fireworks inspired various kinds of incendiary weapons (bombs, fire-arrows, rockets, and lances that spewed fire and potsherds), and ultimately by the thirteenth century exploding bombs in bamboo, then iron, casings. Song dynasty forces used these devices to defend their cities, for a time, against the Mongols. Smooth-bore cannons that could hurl projectiles were known from the late thirteenth and early fourteenth centuries in China.

The Mongols themselves did not make particular use of gunpowder weapons. Nevertheless, it is striking that knowledge about gunpowder and firearms took root in India, the Middle East, and Europe precisely during the Mongol era. It is likely that the information channels opened by the Mongol Empire helped spread this technology. The first field guns in Europe, from the early fifteenth century, closely resemble Chinese cannon of a century or so earlier. Again, the transfer of military technology is rapid.

Gunpowder and gunpowder weapons ultimately changed the way wars were fought; they also contributed to a common pattern of

political consolidation across Eurasia, with centralization of power in monarchies including the Muscovies in Russia and Siberia, the Ottoman Empire, Safavids in Iran, the Mughals in India—states often dubbed “gunpowder empires”—as well as Tokugawa Japan and Ming China. In Europe, the arms race to create more powerful cannon, stronger fortifications, and more efficient firearm-wielding infantry put an end to feudalism and led to intense interstate competition and technological improvement in the manufacture and deployment of firearms. This in turn spurred the creation of overseas empires by the Spanish, Portuguese, Dutch, and ultimately Britain, France, and other European powers. It is not unreasonable to say that silk-road technology transfer in the Mongol era kick-started many military and political developments we associate with the early modern world.

#### The Silk Road

## Chapter 5

### The arts on the silk road

While in Taiwan studying Chinese in the early 1980s, I turned on the TV one morning and happened upon a children's program. A young teacher was passing out juice boxes to her toddlers. Before they drank, however, she had them perform an experiment:

“Xiao Zhang, can you bend a straw in half?”

“I can! Look, teacher!”

“Xiao Li, now try this: can you bend five straws all together?”

“No, teacher, I can't!”

“That's right. And what does this teach us, children?”

“Unity is strength” was her answer. The lesson was certainly important for the Guomindang government of the Republic of China, living under the shadow of mainland China while trying to keep the lid on nativist Taiwanese opposition. But the story is universal. The image of the ancient fasces (bundled birch rods and axes) was already old when Rome adopted it as a symbol of state. In a tale attributed to Aesop (“The Bundle of Sticks”), a father teaches the same lesson to his sons. From there the story was much repeated across Eurasia. It shows up in *The Secret History of the Mongols*, the internal family chronicle of Genghis Khan's clan, where a female ancestor, Alan the Fair, uses a bundle of arrows to exhort her fractious sons to stick together. Tolstoy rewrote it in his collection of fables. Benito Mussolini borrowed the fasces