Two

The Tactics of Transport

To trade, goods have to be moved from seller to buyer—the more cheaply, the more trade there is and the greater the profit. People have struggled for centuries to bring down transport costs, often in ways that are barely perceptible: a careful study of the pottery containers in which olive oil was shipped in Roman times shows a slow but steady trend towards thinner walls, so that less weight was added per volume of oil shipped. But until the age of steam power, there were some fundamental limits to what could be done. Even since then, the story of transportation is not a simple one of technology conquering distance, much less one of the conquest of distance always bringing people closer together or increasing trade.

Natural Limits

Until the invention of the railroad, water transport was much more energy efficient than land transport. A bag of grain in late imperial China rose almost 3 percent in price for every mile it had to be carried overland; a lump of coal 4 percent. So where goods were heavy the cost advantages of water transport could be immense: as late as 1828, some Atlantic seacoast towns in the United States found it cheaper to use English coal for heating than to lug wood from the enormous forests that started just a few miles inland.

Nonetheless, far more ton-miles of goods went by land than by water. Much of this was simple geography: since the vast majority of production and consumption didn’t take place right next to waterways, almost everything that moved went at least partway by land. Moreover, energy efficiency and economic efficiency were not the same thing. True, an animal carrying a load had to eat, but if there was plenty of grass by the side of the road, this might not cost the shipper anything. And if the animal was going to be on the move in search of grass anyway—as was the case with the huge Indian bullock trains in reading 2.3 ("Seats of Government and Their Stomachs")—even long-distance land transport could be astonishingly inexpensive. Often
one didn’t even need to build much of a road—if the land was flat and enough of it uncultivated, the beasts would simply make their own paths as they went. Only where the population was too dense (and land too expensive) for foraging along meandering paths was pre-industrial land transport bound to be painfully expensive—and these were often places where waterways were good. (Both the Netherlands and China’s Yangzi Delta, for instance, despite plenty of money, trade, and engineering skills, had dismal road systems: there was simply no way to bring the costs of land transport down to where they could compete with water anyway.)

In Mesoamerica, the absence of waterways and large beasts of burden did not prevent the Maya and Aztecs from moving goods over enormous and astoundingly difficult terrains. Trade traveled thousands of miles on the backs of men. Packtrains of hundred of tamames (carriers) linked the aristocracy of distant areas. But here it was coerced labor and tributary goods, not commodities produced for profit, that filled the roads (see reading 1.6, “Aztec Traders”). Status and power, not economic calculation of gain and loss, motivated trade.

Whether on land or on water, natural constraints mattered. Except where geography was unusually favorable, it was mostly products with high price-to-bulk ratios that were worth shipping long distances: silks, gold and silver, sugar, and medicinal herbs, not wheat, limestone, or wood. Thus transport powerfully shaped the geographic division of labor and the nature of demand, even where it was good enough to allow a long-distance division of labor to emerge. Sending bulky rice down the Yangzi River and expensive textiles back up against the current was economically viable; reversing those directions would not have been. Shipping fine swords and linens from Spain through Argentina to Potosi was profitable, but exporting wheat, mules, or wine from northern Argentina to Spain was inconceivable (see reading 5.2, “As Rich as Potosi,” in Chapter 5).

Transport costs limited the size of cities as well, because bulky goods like food and fuel could only come so far before they became too expensive (see “Seats of Government and Their Stomachs”)—unless, as in the exceptional case of Potosi, the lonely city sat atop a mountain of silver, enabling the residents to pay sky-high prices without flinching.

Before the nineteenth century, maintaining a competitive edge in trade was difficult. Centers of overland commerce such as the cities along China’s famous Silk Road depended upon political peace to ward off the depredations of armies and bandits. Overland trade routes varied with the fortunes of war. Maritime trade advantages were also at risk because the key to cheap shipping was ships. And ships, in turn, needed masts made from large, difficult to transport timbers. From Venice to Xiamen to the
Americas, great shipping and trading powers found that they either had to secure increasingly remote waterside sources of big trees or allow others to take over shipbuilding. By the eighteenth century, South China had many of its big junks built in Southeast Asia; on the eve of the American Revolution, one-third of the British merchant fleet was built in the New World, while the Royal Navy struggled to monopolize potential masts from places as remote as Quebec and Madras (see reading 2.1, “Woods, Winds, Shipbuilding, and Shipping”). Many of the Portuguese ships that plied the triangular trade between Europe, Africa, and America were built in Bahia, Brazil.

Nature also shaped the rhythms of trade and the places where it was conducted by constraining transportation. All across maritime Asia—from Canton to Mocca—trading schedules were dictated by the monsoon winds. Since strong winds blew consistently in one direction for several months and then stopped, and then blew consistently the other way for months, it made no sense to fight those winds. A trader went as far as he (or occasionally she) could in one direction and then stayed around until the wind reversed; his goods were then picked up by another merchant who had arrived earlier and knew precisely how long into the next season he could safely stay and still have enough days of favorable wind to get home (see reading 2.1, “Wood, Winds, Shipbuilding, and Shipping”). Thus, instead of Chinese traders spending two or more monsoon seasons (and years) sailing all the way to, say, Persia with silks, it made more sense to sail out one monsoon season and exchange with intermediaries based in between and thereby return home with frankincense and rugs. A series of emporia developed at sites such as Melaka, Surat, and the Muscat that had more to do with how far one could travel from there in one sailing season than with what goods could be produced locally. The result was a remarkably lively and cosmopolitan chain of port cities along the Asian littoral, but in many cases these cities had only weak relationships with their immediate hinterlands. (See also reading 1.10, “Deals and Ordeals” in Chapter 1.)

And despite its remarkable efficiency, the system had certain natural limits that no advances in either seafaring or commercial institutions could exceed in the days before steam. Since no merchant could turn back to home before the wind shifted, there was no way to cut the amount of time away from home (and thus the cost of sustaining the crew away from home, as well as the turnover time for capital) below a certain level. In the Atlantic, by contrast, the wind patterns imposed less severe constraints. Major ports arose either because Spanish mercantilism designated them as monopoly entrepôts such as Havana, Cuba, Veracruz, Mexico, and Cartagena, Colombia, or because British laissez faire allowed economics to dictate
their growth. In the former case, government fiat rather than winds set the departure time. In the British case, a shipper who could cut his turnaround time in port could turn his capital over faster, and cut his expenditures on wages for his crew as well.

This is precisely what happened in the eighteenth century, as Scottish traders built warehouses, appointed agents to collect goods in advance, and found other ways to cut their time in New World ports by several weeks on each trip. The results were dramatic, and not only for the traders themselves. As trans-Atlantic shipping costs fell thanks to these innovations, colonists could move further inland (thus incurring higher local shipping costs) and still get their tobacco, rice, and other goods back to Europe at competitive prices. And since most settlers had cash debts to pay (for passage, start-up costs, and industrial goods), it was only when one could successfully export from further inland that Europeans could begin populating areas further from the coast—with all that implied for them and the people they displaced. (See reading 2.4, "Pioneers of Dusty Rooms").

**Limits of Nature**

But even if geography and meteorology shaped pre-industrial transport—and thus economies—their rule was not absolute. Atlantic winds may have been necessary for the breakthrough in shipping costs discussed above, but they were not in themselves sufficient to cause innovation. One not only needed the cost-conscious Scottish traders themselves, but a more or less monocultural pattern of trade. Delegating responsibility for acquiring goods in Baltimore to a local agent was relatively easy if the agent knew that the only thing to purchase in the Chesapeake was tobacco, and that the market back home for tobacco had become so huge that no one ship's cargo could glut it. (It would become even easier in later centuries as standardized grading for commodities developed—see Chapter 6, "Making Modern Markets.") Delegating to an agent was much more difficult when he had to pre-purchase your cargo for a trip home from, say, Melaka, where a typical ship carried a little silk, a little tea, a little porcelain, some incense, some sugar, and so on—whatever was available at a good price (none of it produced locally) in quantities small enough that they would not glut the market back home.

Sometimes it wasn't even clear whether a particular innovation was more a matter of improved control of nature or improved control over people. Shortly before 1600, the Dutch began using a new kind of ship called the *fluitschip*, on their voyages to and from the Baltic. Though clunky and slow-moving, the *fluitschip* could be sailed with a much smaller crew than
most then in use, cutting costs enormously. But the Dutch did not use these cheaper ships in their push into Mediterranean shipping, much less on Atlantic, Pacific, or Indian ocean routes. The reason? The Baltic routes had been cleared of pirates (and rival governments, often pretty much the same thing) but these other routes had not. The much smaller crew of a *fluitschip*, on a slow-moving vessel with minimal gunports, would have been a sitting duck.

Natural port advantages did not guarantee continued success. The port of Mocca, a major entrepôt between Europe and Egypt on one hand and Persia and India on the other, became land-bound as its harbor silted up. Other times, rather than nature dooming a port, humans who inherited, bought, or stole a site with favorable geography could try to exploit it too much, and so lose their advantage. The Isthmus of Panama almost became one such story: though it was a logical place for a badly needed Atlantic–Pacific canal, its reputation was so tainted by a French company that made the first attempt (and lied to investors about the difficulties it was having) that it nearly lost out to a trans-Nicaraguan route. By the time the rival machinations of competing groups of investors and imperialists were over, Panama had the canal, but the United States had seized the relevant part of Panama. (See reading 2.7, “Scandalous Panama.”)

In other cases, just the possibility that people might try to monopolize a locational advantage could spur pre-emptive action: thus fears that the Dutch might squeeze traffic through the straits connecting the Indian Ocean and South China Sea once they were restored to power there (though the Dutch, desperately dependent on Britain in the aftermath of the Napoleonic Wars, would have been very vulnerable) were enough to convince Stamford Raffles to set up an alternate port, committed to free trade, at this choke-point of world trade: the city of Singapore. (For this, Raffles was punished by his more cautious, diplomacy-minded superiors: see reading 2.6, “Winning Raffles.”)

**Power-Driven Transport: New Time, New Space, Old Conflicts**

Steam and the railroad would scramble the world’s trade geography in the nineteenth century. With the rise of steam power human control increased enormously—but not infinitely. Steamships could go upstream almost as easily as downstream, and could sail the ocean at any time of year. But in at least some stormy seas, they did so at their peril. Steam shovels could dig canals, dredge harbors, and so on, much faster and more effectively than ever before. Peacetime freight rates went into free-fall, or so it seemed: about 80 percent per pound for most commodities crossing the Atlantic.
between 1815 and 1850, and then another 70 percent from 1870–1900, for a cumulative fall of almost 95 percent.

The changes on land were even bigger. Railroads could, for the first time, move heavy loads cheaply over long overland stretches, but not where there was too steep a grade. (Since trains are far too heavy to rely on inflatable tires, they use smooth wheels. Thus, there is very little friction between railroad wheels and track, and going up steep grades is almost impossible—even today, it is impossible to build railroads on grades a steep as those that cars and trucks, with road-gripping tires, can handle.) Moreover, the enormous expense of railroad-building through under-developed areas meant that even a large amount of transport cost savings could go with disappointing earnings (see reading 2.9, "Guaranteed Profits and Half-Fulfilled Hopes").

Railroads also created their own peculiar needs. It was, for instance, very expensive to keep a steam locomotive waiting at a station to be loaded, and extremely slow to start one up again if you turned it off. Thus, loading stops had to be brief, and grain (for instance) came to be loaded from elevators that released a flood of wheat into the car when opened, rather than loaded in separate bags. But using grain elevators meant giving up on keeping farmer Jones’s wheat separate from Farmer Smith’s—with far-reaching consequences that we explore in Chapter 6.4 on commodities in the modern world economy.

By vastly increasing the speed and volume of the carrying trade while dramatically slashing prices, railroads and steamships set into motion a conceptual revolution in time, space, and commodification. With steam, the Atlantic and Pacific shrank to ponds and continents to small principalities. Distant neighbors became proximate, indeed closer to others in ports or on the same rail lines than they were to people nearer in terms of miles but removed from the transportation networks. With the transportation bottlenecks gone, time was money. Greater volume meant greater profit rather than gluts. As time and distance evaporated, the middleman between buyer and seller often lost importance. Manufacturers and financiers came to predominate over merchants; advertisers—who tried to bridge cultural distances, which closed more slowly than physical ones—also grew in importance. The global supermarket began taking shape in the nineteenth century. Luxuries no longer dominated the long-distance trade. Beef and mutton from Argentina, Uruguay, and the United States and wheat from Australia, the United States, and India fed hungry European populations; Japanese mills mixed U.S., Indian, and Chinese cotton. As goods from numerous countries competed in the world’s markets, the need for standardization and commodity markets arose. (See reading 6.4, “Growing Global,” in Chapter 6.)
Thus transportation not only determined profit, loss, and volume of trade. It created neighbors, shaped the sense of time, redrew the maps, and unleashed the conceptual revolutions known today as commodification and globalization. But as much as the transport revolution changed, it still has not, as some people predicted (and continue to predict), made geography irrelevant.

For one thing, people need to seize opportunities, and even societies very attuned to profit do not pursue every chance. The late nineteenth-century United States, for instance, busily developing a conquered continent, largely turned its back on the sea, letting a once-powerful merchant marine evaporate and abandoning even routes (such as those to Brazil) where it seemed to have a natural advantage. (See reading 2.10, “The Yankees Strike Out”)

In other cases, people did seize opportunities to bridge physical distances, but inadvertently increased cultural distances. In the Dutch East Indies (now Indonesia), for instance, a barrage of late nineteenth-century changes seemed destined to strengthen relations between colony and motherland. Improvements in ocean shipping were compounded by the building of the Suez Canal, which helped cut sailing times by almost two-thirds in just a decade; transoceanic cables meant that the news could now, for the first time, move almost instantaneously—at a fraction of the cost of goods. But in the context of colonialism and late nineteenth-century racism, divisions actually increased.

With more European goods available (as well as advances in medicine), the Dutchmen who ruled the colonies found that for the first time they could find middle-class Dutch women to join them; inter-racial unions declined sharply, and with them one tense but real bridge between communities. And as it became more feasible for Dutch administrators and businessmen to return to Europe (either for visits or to settle down with the wealth they had accumulated overseas) their sense of belonging to an “East Indies” society became much weaker. Meanwhile, Chinese laborers and merchants, discriminated against by both European rulers and most indigenous communities, found that the telegraph allowed them to maintain closer ties to China; Chinese-language schools, knowledge of home-country affairs, and fundraising for Chinese causes all increased. And for Indonesia’s Muslim majority, the re-routing of shipping through the Canal (rather than around the tip of Africa) made it much easier to keep in touch with Middle Eastern developments, including the rise of a reform-minded “modernist” Islam. (See reading 2.8, “E Unum Pluribus.”) So here, at least, advances in transport and communications did more to create separations (both within the colony and between it and the metropole) than to bring people together. Technology can change the ease with which people move themselves and their
2.1 Woods, Winds, Shipbuilding, and Shipping—
Why China Didn’t Rule the Waves

Quick—what were the largest ships in the pre-industrial world? Not the Spanish galleons that brought New World silver across the Atlantic; and not the British men o’ war that finally drove those galleons from the sea. Both were outclassed by the “treasure ships” made for the Chinese navy.

First put afloat centuries before those European vessels, the treasure ships ranged far and wide in the 1300s and early 1400s, touching the East African coastline and, some believe, rounding the Cape of Good Hope—unmatched distances for that era. At 7,800 tons, the biggest of these were three times the size of anything the British navy put afloat before the 1800s.

With such a big lead in naval affairs, it seems a wonder that the Chinese never became a sea power on par with latter-day England, Spain, Holland, or Portugal. No wonder, though, if you examine history closely.

China’s stint as a sea power all but ended when the Ming Dynasty withdrew support for treasure ship journeys after 1433. From then on, Chinese ships stayed to the east of present-day Singapore. Within a few decades, the initiative in long-distance exploration—and later in trade, too—passed to the Europeans.

The government’s policy shift began when a new faction gained influence in China’s Ming court. Its members advocated a greater focus on domestic and continental matters, emphasizing agricultural production, internal stability, a military buildup and colonization at the edges of the Central Asian steppe, and refurbishment of the Great Wall, designed to repel invaders.

That explains the end of government-sponsored navigation. But, though many think all of China turned inward along with the government, the real story is very different. The curtailing of private sector ocean trips involved more complex factors. Private traders became more active than ever on the Southeast Asian shipping routes, but never went as far as the treasure ships had. Unlike the Ming court, private traders based their decision on market forces.

Timber for big boats was expensive, especially in busy trade centers, since large populations meant heavy use of firewood and building wood. China wasn’t alone in the wood shortage. Until coal became widely available as a suitable cooking and heating fuel, Europeans struggled with shortages. All over Europe, as well as in Japan and parts of India, govern-
ments went to great lengths to control the price and supply of wood. Venice’s shipyards fell silent for lack of lumber, while the British took extraordinary measures to save theirs, even passing laws that reserved all trees of a certain height and strength in the forests of New England for the Royal Navy. (Enforcing the laws proved to be another matter, though.)

The Chinese government simply let the timber market work. Once the Ming stopped building massive and expensive treasure ships, they paid little attention to timber prices. Their successors in the Qing Dynasty, which held sway from 1644 to 1912, engaged in a short-lived attempt to fix prices during an early palace-building spree, but quickly left it to the market.

The market responded by developing a huge private trade in timber, which grew up wherever there was water transport. Logs were floated hundreds of miles from interior forests down all of China’s major rivers and canals to meet the needs of the densely populated regions near present-day Shanghai, Canton, and Beijing. Regional centers sent back cloth, iron goods, and other manufactures. Wood also moved on the seas, from Manchuria, Fujian, and even from present-day Vietnam and Thailand.

But these methods were only good for tapping resources already close to water routes, and coastal and riverside forests were quickly used up. Moving logs from the deep forests used too much labor, so by the eighteenth century the cost of building a boat on the central China coast had risen about three times as fast as the price of rice, China’s staple food, and our most reliable indicator of the general cost of living.

Chinese shippers took the logical, market-driven way out: contracting for construction of boats at various Southeast Asian locations, often in shipyards run by their relatives or other Chinese emigrants. China wasn’t closed, and the market didn’t halt because of artificial factors. There just wasn’t a market for the outsized “treasure ships” anymore.

Instead of financing big ships for long hauls to India and the Middle East, Chinese traders commissioned smaller vessels, capable of carrying porcelain and silk to midway points, where traders would buy Indian cotton and indigo for the return trip.

The shorter routes also fit better with weather patterns, keeping Chinese merchants out of far flung ports where shifting monsoon winds could strand a ship for months. Maximizing profit meant relying on the entrepôts that developed where the winds made it convenient to meet; a series of these meeting places created an efficient marketing network that allowed the exchange of products all the way from the Mediterranean to Japan, China, and Korea, without anyone being gone for more than one season.

Deference to the weather proved good business, but was a detriment to the development of shipbuilding and open ocean navigation. To make big
ships and long voyages worth the investment required ulterior motives, such as missionary work, military competition, or the desire to monopolize the seas and bypass the competitive markets in all these port cities. The Chinese left such ambitious projects to the Europeans, who proved willing to defy market principles, thereby launching a new era and pattern for world trade.
2.6 Winning Raffles

In the fifteen years he served the British East India Company in Asia, Stamford Raffles conquered Java, wrote three books, gathered much of the original collection of the London Zoo, and above all, founded Singapore. The Company denied him a pension, and dunned his widow for expenses he had claimed while creating Southeast Asia’s greatest trading center.

Few people did more to promote British commerce in Asia than Stamford Raffles; and perhaps nobody did more to define the values of the empire in its nineteenth-century “liberal” phase. Born in 1781—just three months before the British defeat at Yorktown that sealed the thirteen colonies’ independence and signaled the limits of an empire of white settler colonies—Raffles started work at age fourteen for the flag-bearer of a different kind of British Empire, the East India Co., which traded with and sometimes ruled over long-established societies in South Asia. (Raffles began work so young because his father died suddenly and in debt. This side of his story also made him a fitting emblem of the nineteenth-century British Empire; though such rags-to-riches stories were actually rare, the idea that any enterprising young man could make his way by helping British commerce expand to reach new fields overseas was a myth dear to English hearts.)

For ten years, Raffles labored anonymously in the firm’s London offices; when given a chance to go to Penang, on the Malay Peninsula, in 1805, he grabbed it. Always extremely ambitious (in several of his letters, he compares himself to Napoleon), Raffles made himself nearly indispensable by teaching himself Malay on the voyage to Penang; almost nobody else in the company’s employ spoke the language. Though he was fascinated by every aspect of the area (on a leave back to London, he took with him over thirty tons of sketches, plants, animals, and local artifacts), Raffles had his eye from the beginning on bigger things, and on points further east. The Napoleonic Wars gave him his chance, for with Holland, the colonial master of present-day Indonesia, under Bonaparte’s rule, its loosely held possessions were up for grabs. And in fact, Raffles thought even bigger than that: his very first memo about Southeast Asian affairs stressed the value that a new British settlement in the Netherlands Indies would have as a base for expanding British trade with China. In 1811, he sailed as the number two
But on truly new frontiers, the state was often less accommodating, and even discouraging. Migration to Taiwan and Manchuria were banned for long periods, as the government sought to protect the indigenous peoples of these areas—or at least avoid the costs of putting down rebellions. In Manchuria, the Qing Dynasty (1644–1912) was protecting its own ancestral homeland, a place that nurtured the horsemanship and martial values that had made the Qing conquest of China. Moreover, the forests were the source of ginseng root—a lucrative royal trade monopoly. The soybeans and wheat the settlers would grow instead might have filled stomachs, but not the imperial treasury. (In the New World, by contrast, it was usually the colonists’ crops—sugar, tobacco, coffee, and so forth—that entered foreign trade on a large scale, generating government revenues far beyond what furs and skins could yield.)

Taiwan also had forest exports—the indigenous people sold deerskins and other forest products to the Dutch traders who arrived after 1600—and the Qing feared that too many farmers clearing the forests would create an explosive anti-Chinese alliance. So even once it became clear that the government couldn’t stop Chinese from settling Taiwan, the state worked hard to make sure the natives didn’t lose everything. They insisted, for instance, that Chinese farmers could not own the land they cleared; while they might gain permanent surface rights, and be allowed to sell, rent, or pass on those rights, those who had been there before still owned the subsoil, and thus could collect rent that might partly offset losses from the shrinking forest. And when convinced that settlers were pushing too hard and causing instability, the government was willing to arm and ally with native peoples to restore the status quo—hardly a likely scenario in the New World.

So why did so many more Chinese than Europeans pull up stakes? In part, no doubt, because migration offered them farms of their own almost immediately. In many European colonies, on the other hand, elites were allowed to gobble up all the land, so ordinary folk could only hope to gain land after surviving a period of indentured servitude. And in part because, contrary to most stereotypes, they started out less encumbered than most Europeans. Until the French Revolution, many Europeans were legally bound to a piece of land and/or a feudal master. Even those who had the right to leave often could not have sold their interest in the land to finance their passage. By contrast, the overwhelming majority of Chinese peasants were independent smallholders, or tenants whose relations with their landlords were based on contract, not legal subordination. In the economic sphere, they were simply freer than their European contemporaries—and that meant, among other things, freer to move. It was only once European peasants and artisans “caught up” in this regard—and once many of them
civilian (and chief strategist) of a force of 9,500 that took Java from the Dutch; he then served as its governor for the next four and a half years.

Raffles was also fired by a vision of a simultaneously liberal and authoritarian empire, with free trade as its cornerstone; he was convinced this would be good for the natives, as well as the British. At least on paper, he abolished the Dutch system in which villages were forced to do a quota of unpaid labor cultivating export crops in order to keep access to the land on which they grew rice for themselves. Auctioning the land to the highest bidder and assessing taxes on it, he reasoned, would be enough to assure a steady stream of sugar, coffee, and other exports, while giving peasants a chance to participate in the market. Slavery was to be abolished; tax money was to be used to build roads and make other improvements favorable to trade. But quite aside from the chaos that resulted from trying to introduce capitalism overnight, Raffles had another problem in Java: neither his employers nor the British foreign ministry favored this application of English principles. Whitehall Street was eager to have Holland as an ally in post-Napoleonic Europe, and so planned to return their empire to them, and for the East India Company that made Raffles’s road-building and other reforms an expensive investment from which they would never see much profit. Within a year of the war’s end, Raffles was sent to the backwater post of Bencoolen (also in Malaya) and given a decidedly mixed personnel review; probably only the high-ranking friends (including the crown prince) that he had made on a furlough back in London—where he was celebrated as a war hero, explorer, naturalist, and anthropologist—guaranteed him even that much.

As frustrating to Raffles as the detour in his own career was the opportunity he was sure Britain was missing. Not only had they restored the East Indies to the Dutch, they tolerated Holland’s re-imposition of its monopoly on almost all trade with this vast archipelago. (As London saw it, such tolerance was necessary, since spoils from Indonesia were essential to rebuilding and stabilizing a Holland ravaged during the war.) To enforce that monopoly, the Dutch continually harassed foreign ships in their waters, and often refused to serve those that entered their ports. And since Indonesia stood along the only possible sea routes linking the Indian Ocean with the Pacific, this placed the Dutch firmly in the way of non-Dutch merchants dreaming of great profits to be made in China and Japan. For Raffles’s bosses at the East India Co., this was only an irritation, but for smaller “country” traders, it was a disaster. Their smaller ships were more often in need of taking on supplies in between India and China; and they had a special financial need as well. Being less well capitalized than the EIC, they found it a great hardship to wait the several months of an ocean voyage to China before seeing any return on the working capital they had invested in
cargo, crew, and stores; they needed to turn over their stock sooner, and above all had to avoid failing to return before the monsoon shifted, becalming ships and forcing several months' more wait before a trip's profits returned home. For centuries before the Europeans came, this problem had been solved by having ships coming from China meet those coming from India and the Middle East somewhere in the straits of Malacca; a variety of towns there had had their decades (or centuries) of glory before greedy pirates or monarchs killed them off by charging too much for protection. Now it was the Dutch who monopolized this perfect spot for an entrepot: Raffles, who may have known the area's commercial history better than any European, was determined to plant an outpost for free trade there.

By swamping his supervisor—the governor general of India, based in Calcutta—with memos about how the Dutch were tightening a noose around the Calcutta—Canton trade, one of the EIC's biggest moneymakers (largely thanks to opium sales), Raffles eventually obtained vaguely worded instructions, which could conceivably be said to include permission for armed intervention. That was all he wanted: taking advantage of a succession dispute between two brothers of a deceased sultan, Raffles arrived at the future site of Singapore on January 29, 1819, recognized the brother who had lost out, persuaded him (and his uncle, the real power in the family) to lease Singapore for 8,000 silver dollars per year, and sent in a token force of British soldiers to deter any Dutch action against the new town. The whole process took a week.

The controversy lasted longer. The Dutch protested vehemently, but ultimately did nothing; meanwhile, the EIC and the British foreign ministry, afraid of new commitments and of giving offense, delayed recognizing the settlement. But as Raffles had guessed, time was on his side. Independent merchants in both Calcutta and London saw things as he did, and wrote volumes of letters, editorials, and leaflets demanding support for the new colony. Perhaps more important, these merchants voted with feet, their boats, and their capital. Within two and a half years, the little fishing village had over 10,000 inhabitants (mostly Chinese merchants); 2,839 vessels (all but 383 of them Asian owned) had cleared port. And the next year's figures exceeded those for the first two and a half combined. From Singapore, Britain could join in and piggyback on an intra-Asian trade much larger than the direct England—Asia commerce for which the EIC had a licensed monopoly; they could also bend that trade to their own purposes, pushing old and new exports from India to the Far East (spices, indigo, opium) in place of those from Indonesia. In March 1824, both Britain and Holland ratified the inevitable, recognizing the bustling free trade port of Singapore as a British possession.
in their pressure on the government to keep Singapore no matter what the Dutch said or did; the demands of many that Britain force open the ports of China and Japan—where Whitehall and the EIC preferred to move more slowly—was an omen for the future. (Another omen for the future was that the government of Singapore, having committed itself to a no-tariff policy and having little land to tax, found itself almost entirely dependent for revenue on one exception to its free trade ethos: an opium monopoly.)

This new “free trade” empire brought unprecedented profits, but also unprecedented change. As the man who unleashed the whirlwind, Raffles caused discomfort among the supposed leaders of this transformation, many of whom actually preferred the supposedly safer profits of a world that moved slowly enough for London to call the shots.
2.9 Guaranteed Profits and Half-Fulfilled Hopes: Railroad-Building in British India

The pre-eminent symbol of global transformation in the nineteenth century was the railroad. It cut land freight costs by as much as 95 percent and multiplied trade accordingly. It gave us standardized time, as it became necessary for people long distances apart to coordinate their movements to the minute. It standardized commodities: loading separate bags of wheat from Jones’s farm and Smith’s farm while a train waited under full steam was too slow and expensive, so we got the grain elevator. People understood that it required a certain mind-set to live in the railroad’s world: one that emphasized reasoned calculation and overthrew old and “inexact” habits. In fact, late nineteenth-century Social Darwinists often used the perceived ability (or lack thereof) of various people to build, run, and take advantage of railways as standard gauge of the supposedly genetic “fitness” of various peoples for modern life.
So when India—which by 1910 had the fourth largest rail network in the world, with 85 percent of Asia’s total track—did not promptly become a modern society, and the railroads themselves earned only modest profits, the search for what was wrong with the “natives” was on. But if Europeans had looked a bit more closely at how the railroads were built, and what they did, these mysteries might have vanished.

First, the huge extent of the rail network should not have raised expectations but lowered them. Many of the lines (including some very long ones out to the frontiers) were built to move troops, not goods; others, explicitly referred to as “famine lines,” went to India’s poorest areas, which frequently suffered harvest failure and also had poor transit—areas so poor that they were unlikely to provide much rail traffic except when others brought in food to save lives (and social stability). Moreover, Britain arranged private financing for these financially questionable lines by making the colonial regime give investors a guarantee: if any approved line failed to earn a 5 percent return on capital in any year, the Indian taxpayers would make up the difference. (Similar guarantees were made on Ottoman and some other railroads.) The result was a boon to London financiers—and to other British firms, who provided virtually all the track, rolling stock, skilled laborers, and even much of the coal. This led to even more building of lines with limited commercial potential—and a lot of gold-plated construction, as banker and boilermaker both benefited from raising the amount of capital on which a return was guaranteed. (Another result was that, unlike elsewhere, Indian railroad-building did not stimulate indigenous steel-making, engineering, or even coal-mining; nor did it train a group of skilled people who could then transfer knowledge to other industries.)

The giant rail net did, of course, make rates for overland freight fall sharply, but in some places (especially along the Ganges) traditional transport was still competitive. And while the volume of commerce did boom, neither its growth nor the displacement of traditional transport was as rapid as people expected. In 1882 (after thirty years of building) India’s rails carried about 4 billion ton-km of freight; but in 1800, bullock caravans in North India alone had probably carried over 3 billion, and population had doubled in between. Moreover, even these falling shipping rates were still high relative to the population’s spending power. In 1890, it still cost 22 percent of average per capita income to move 200 kilograms 1,500 kilometers; in the United States, the same transport cost 1 percent of the average person’s income. And the rate structure made it much cheaper to ship on trunk lines leading to ports than on branch lines: good for India’s booming exports, but bad for the development of domestic markets.

The part of these disappointing results most apparent to the English
themselves was that most of the lines made little money. In 1900, 70 percent of India’s track belonged to lines that needed subsidies from Indian taxpayers to reach their 5 percent return; most earned under 3.5 percent. In 1881, two lines accounted for 56 percent of all Indian railway earnings. The subsidies, though quite small relative to the transport costs saved by railroads, were bitterly resented in India. Meanwhile, Englishmen who had prophesied that “Railways are opening the eyes of the people . . . they teach them that time is worth money . . . introduce them to men of other ideas . . . above all they induce in them habits of self-dependence . . .” and that “30 miles an hour is fatal to paganism and superstition,” now sneered that “all civilization disappeared beyond 100 yards on either side of the track.”

But the railroads were making a difference—just not as fast as the English had assumed, not in every case, and not always quite the difference that had been expected. By the 1920s, shipping rates had declined 80 percent relative to income (the same rate at which they fell in the United States over those years), and the volume of traffic soared 1,000 percent between 1882 and 1947. More frontier areas developed cash crops, generating civilian uses for lines once built for largely military purposes. Rice- and wheat-growing areas each began to eat more of the other grain, so the effects of a blight striking either crop were reduced. Perhaps most important, the so-called “famine lines” proved their worth repeatedly as suppliers of relief, making harvest failures in marginal areas far less catastrophic than they had been. And so, while being covered with a rail net did not transform India’s economy, much less its culture, as some foreigners had expected it to do, it did give India a stronger safety net, giving railroads a powerful impact even where their own earnings suggested that they were not much in demand. Thus, in colonial India, railroads built to suit English generals, investors, and steel-makers may actually have done more to make certain parts of the old society more viable than they did to usher in a new one.