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OF THE WESTERN WORLD

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# THE GREAT DIVERGENCE

## CHINA, EUROPE, AND THE MAKING OF THE MODERN WORLD ECONOMY

***Kenneth Pomeranz***



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## ABOLISHING THE LAND CONSTRAINT: THE AMERICAS AS A NEW KIND OF PERIPHERY

ONE CORE, western Europe, was able to escape the proto-industrial cul de sac and transfer handicraft workers into modern industries as the technology became available. It could do this, in large part, because the exploitation of the New World made it unnecessary to mobilize the huge numbers of additional workers who would have been needed to use Europe's own land in much more intensive and ecologically sustainable ways—if even that could have provided enough primary products to keep ahead of nineteenth-century population growth. The New World yielded both "real resources" and precious metals, which require separate treatment. Let us begin with real resources; they, in turn, begin with plantation products from the Caribbean, northeastern Brazil, and later the southern United States.

The New World's farm exports were largely slave grown. The plantations were almost all either on islands or near the coast. Consequently, exports from the circum-Caribbean plantation zone did not plateau the way that exports from the Chinese interior to Jiangnan and Lingnan did when free laborers ran into diminishing returns and switched more of their efforts to handicrafts; nor were they beset by the soaring transport costs that Old World foresters faced once they moved away from the riverbanks. And because the proprietors of New World plantations (unlike those of eastern European estates or southeast Asian pepper fields) purchased most of their labor force from abroad and often curtailed their subsistence production, western Europe's trade with this area also escaped the "small-market problem" that had dogged its trade for eastern European raw materials. Exports had to be high enough to cover the costs of buying slaves and much of the cost of feeding and clothing them.

There were many reasons why African slaves became the principal workforce in so many New World colonies. First and foremost are the astonishing death rates among New World peoples after contact, mostly from disease. Few of Europe's poor, as we have seen, could pay their own passage before 1800, and they were only worth transporting if one could force them to produce exports. With outright enslavement of Europeans unacceptable, this meant indentures that would end with freedom and a grant of land. As survival rates for Europeans (and Africans) in the New World began to improve, this



became too expensive for most plantation owners; they preferred to pay more money up front and get a slave who never had to be freed.[1] The surviving New World peoples were sometimes enslaved (especially in Brazil), but Africans were preferred for several reasons. New World peoples were seen as fragile because so many died upon contact with Europeans; and at least some Europeans opposed their enslavement on humanitarian grounds (but not that of Africans).[2] Amerindians also would have found it much easier to flee and to make common cause with unconquered native peoples nearby (though Africans sometimes did this, too). And since the conquest of native peoples slowed down considerably after the first half century (once smallpox had done its worst damage and various indigenous peoples had acquired guns and horses), acquiring indigenous slaves was not always easy.[3] By contrast, the large internal slave trade in Africa made it relatively easy for Europeans to acquire slaves there, as long as they had goods that the slaveholders wanted. Meanwhile, the Spanish and the Portuguese crowns preferred the transatlantic slave trade to New World slave-raiding, because the former was much easier to monitor and tax than local slave-raiding.[4] This was yet another way in which interstate competition and military fiscalism indirectly helped accelerate the repopulation of the New World from overseas and helped place the settlers in a context in which they (unlike, say, settlers on the Chinese frontier) would find it hard to switch away from a focus on export production. The slaves had no choice at all, and even their owners may have had little choice, since they (unlike a hypothetical group raiding locally for slaves) had to pay for their purchased workforce.

Slave imports to the British West Indies equaled roughly one-fourth of sugar export revenues between 1760 and 1810; imports from Britain itself covered about one-half, and food and wood from British North America (above and beyond the amounts swapped directly for sugar) covered the remaining quarter.[5] French Caribbean sugar exports were about 15 percent below those of Britain just before the French and Haitian Revolutions, and its slave imports were almost identical to those for the British Caribbean throughout the eighteenth century: so here slave imports should have covered roughly 30 percent of sugar revenue.[6] And in Brazil, the world's largest slave importer, the prices paid for imported slaves in 1821–26 (the first set of several consecutive years for which I found figures) equaled the country's total export

[1] Galenson 1989: 52, 76; Morgan 1975: 215–16, 296–99.

[2] Thornton 1992: 135–36.

[3] Ibid., 138–41.

[4] Ibid., 136–37.

[5] Calculations based on slave prices from Miller 1986: 70; British import data based on Mitchell 1988: 462–64 and Deerr 1949–50: 1: See also appendix D.

[6] For export volumes, see Deerr on the British Caribbean (1949–50: I: 193–203) and the French Caribbean (I: 235–42); for slave imports, see Curtin 1969: 216.

revenues for those years.[7] Since the 1820s saw an unusually high volume of high-priced slave imports, this is no doubt atypical: the late eighteenth-century average was probably closer to one-fourth the value of all exports, much as in the British and French West Indies.[8] Thus, the slave trade helped make Euro-American trade fundamentally different and more expandable than the more direct exchanges of raw materials for manufactured goods and silver between Old World cores and peripheries.

Furthermore, though nearly all bound cash-crop producers in the Old World also grew what was needed for their subsistence, many New World slaves had little or no opportunity for subsistence farming. And since for a long time plantation owners purchased very few women slaves (and manumitted more of them than they did men), many slaves also lacked families, who helped supply the subsistence needs of compulsory cash-crop workers in many Old World settings.[9] Thus, despite their poverty, the everyday needs of slaves created a significant market for imports; in this, slaves were unlike most of the unfree populations in Old World peripheries. These goods (above all cheap cotton cloth for slaves to wear) were a large part of the manufactured imports that took up almost 50 percent of sugar export proceeds in the British Caribbean. Some of these goods were always made in Europe; others came at first from India via Europe but were later replaced by British imitations.

Grain and wood from British North America (above and beyond an unknown amount obtained in direct barter for sugar) took up the remaining one-quarter of Caribbean sugar revenue. And since this trade enabled the mainland to pay for its own imports of British manufactures,[10] it represented an indirect route through which Britain turned still more of its relatively abundant capital and labor into land-saving imports. Slave plantations in Brazil and British North America acquired more of their supplies locally than those in the Caribbean, and Brazilian plantations in particular also economized by providing exceptionally skimpy food and clothing to their slaves;[11] thus they purchased less from abroad, but these needs were still non-trivial.[12] Moreover, the Brazilian strategies that limited supply purchases—from skimpy diets to unbalanced sex ratios—increased the need to replenish the supply of slaves themselves with fresh purchases from Africa.

[7] Figures for 1821–26 from Miller (1986: 70) and Ludwig (1985: 107, 314), using a rough price of 250,000 *reis* per slave (toward the low end of Miller's range); calculation methods the same as for West Indies.

[8] For slave purchases and prices, see Miller 1986: 70; Ludwig 1985: 107, 314; Curtin 1969: 216. Brazilian export figures for 1796 and 1806 from Morineau 1985: 177–78.

[9] See, e.g., Schwartz (1985: 354–58, 385) on sex ratios and marriage rates in Brazil.

[10] See Shepherd and Walton 1972: 43–44; Richardson 1987: 765–66.

[11] See, e.g., Schwartz (1985: 136–38, 296, 436, 441–42) on Brazil.

[12] See, e.g., Subrahmanyam (1993: 182–85 on the cheapest cloth being shipped to Brazil for slave clothing.



Thus, slavery helped make Euro-American trade unlike any between Old World cores and peripheries. A free-labor periphery like southwest China would not have served Europe as well, even if it had been just as ecologically bountiful; nor would a periphery like eastern Europe (or later Java) in which participants in a still-functioning subsistence-oriented economy were forced into part-time export production. Silver exports from Potosi, which fell as the native population recovered and a more self-sufficient regional economy reemerged,[13] remind us that European demand alone did not ensure a continued flow of a commodity to Europe without either massive force or the *reproduction* of local needs for European goods. We will return to silver shortly. What needs emphasizing here is that it was not only ecology that made so much sugar, tobacco, and later cotton flow from the circum-Caribbean region: the region was also sociologically and politically set up to "need" almost everything else. Indeed, one of Britain's advantages was that unlike France, Holland, or Denmark, it did not need to ship *food* from Europe to its sugar colonies but could rely on continental North America to do so, which in turn bought English manufactures (employing labor and capital rather than land).

Thus, a combination of depopulation and repopulation with slaves made the circum-Caribbean region a perversely large market for imports and a source of land-intensive exports. In fact, it became the first periphery to assume a now familiar "Third World" profile: that of a large importer of both capital goods (in this case, walking, talking, kidnaped ones) and manufactured goods for daily use, with exports that kept falling in price as production became more efficient, capital intensive, and widespread. By contrast, the prices of most forms of energy produced in Europe, including food, rose throughout the eighteenth century, relative to both wages and other goods.[14] Thus the plantation areas of the New World were a new kind of periphery: one that would import enough to keep its trade with the core fairly balanced. Moreover, its imports and exports stimulated each other: more sugar exports consistently led to more slave imports, more food and clothing imports, and (often) more plantation debt, which led to selling more sugar next year, at whatever price.[15]

Meanwhile, concentration on one or two exports in most plantation areas greatly facilitated a crucial improvement in trade itself. Transatlantic shipping costs fell roughly 50 percent during the eighteenth century, even without substantial technological change. Part of the decline was due to political change:

[13] Lang 1975: 61, 65–66. See also Stern (1988) for a more general discussion of the reemergence of economies with a significant degree of internal coherence and autonomy in the Spanish-ruled New World.

[14] See, for instance, the chart in Goldstone 1991: 186; also Thomas 1985a: 140–41.

[15] Richardson (1987: 745–46) shows a direct relationship between the exports of sugar from the British West Indies in any given year and the area's demand for slaves in the following year, which in turn produced more sugar.

the British Navy repressed most piracy, which reduced insurance rates and allowed more freight to travel on unarmed ships with smaller crews.[16] However, the other major component (briefly discussed in chapter 4) was a sharp decline in the time spent acquiring cargo. This meant a faster turnover of working capital, more intensive use of ships, and large savings in sailors' wages (who had to be paid for every day away from home, even if they were waiting in port while a cargo was purchased). This reduction in port time was achieved by having a local agent collect the desired goods in a warehouse before the ship arrived, rather than having the ship visit many plantations and spend time haggling. Such delegation of responsibility was much easier when each area only sold one or two exports, rather than the numerous possibilities in, say, an Indian Ocean port.[17]

Thus, while seeking more primary products from many Old World peripheries meant exhausting the most accessible sources, facing higher transport costs, and working against the logic of import substitution, an opposite dynamic was at work in much of the New World. With political and sociological factors working against import substitution, export monocultures brought down transatlantic transport and transaction costs. This in turn allowed Americans to incur higher local transport costs—i.e., expand further inland—and still sell enough in Europe to pay for manufactures and repay start-up costs. This dynamic operated whether the labor in question was slave, indentured, or free but in need of start-up money, and it played a crucial role in populating North America.[18] It also helped the transatlantic exchange of manufactured goods (and kidnaped "capital goods") keep expanding, unlike the Baltic trade or the trade from the Chinese interior.

In other words, a demographic catastrophe, colonial legislation, and slavery combined to create a periphery that was an ever-expanding source of raw materials in an era before most production required expensive capital goods and when most people still had some connection to subsistence production. Indeed, this situation proved temporary even in much of the New World; as population levels recovered in Peru and Mexico, more self-sufficient economies reemerged and exports fell.[19] Without the peculiar conditions created in the circum-Caribbean region, the mere existence of trade between a rich, free labor core and a poorer, bound labor periphery would not have had such epochal effects; western Europe's trade with eastern Europe, for instance, was in no way more important or dynamic than that between the Lower Yangzi and its various free labor peripheries. The form of labor control on the periphery was indeed crucial, as world-systems theorists insist, but we oversimplify

[16] Shepherd and Walton 1972: 81–84.

[17] Ibid., 52–53, 87. On the enormous diversity of cargo carried on any given merchant ship in the Indian Ocean, see Van Leur 1955: 132, 253; Chaudhuri 1978: 204–8.

[18] Shepherd and Walton 1972; especially McCusker and Menard 1985: 18, 23, 28–30.

[19] Lang 1975: 61, 65–66.



greatly if we lump together all kinds of "coerced cash-crop producers." New World slavery and colonialism were different in very important ways.

Earlier arguments about the importance of slavery in European (especially British) industrial growth have often focused on export markets as a stimulus for burgeoning industries; they have thus been vulnerable to the "internalist" argument that domestic markets were growing, too, and off a much larger base. Such debates may be inherently inconclusive—if Caribbean demand accounted for 12 percent of the growth of British industrial output between 1748 and 1776,[20] is the proverbial glass half full or half empty? By contrast, the argument here emphasizes that some markets mattered more than others. For the New World and the slave trade offered what an expanding home market could not have: ways in which manufactured goods created without much use of British land could be turned into ever-increasing amounts of land-intensive food and fiber (and later timber) at reasonable (and even falling) prices.

## Another New World, Another Windfall: Precious Metals

Meanwhile, Mexico, Peru, and later Brazil sent Europe vast amounts of precious metals. Some of this was the direct result of colonial extraction, such as the Spanish and Portuguese kings' cut of all mining in their domains. Legally, this share was at least 27.5 percent—and perhaps as much as 40 percent—of all shipments prior to 1640.[21] Since these rates quickly led to widespread smuggling, the crown's actual share of output was never that high, and the legal rates were gradually lowered to try to reduce contraband; even so, the crown probably received one-tenth to one-fifth of registered output.[22]

A substantial further portion of the flow was only slightly less directly based on coercion. Forced labor quotas lowered the costs of mining, whether indigenous people actually did the labor themselves or bought their way out of it, subsidizing the wages of others.[23] While the direct beneficiaries of these quotas were mining entrepreneurs resident in the New World, they clearly increased the output possible at any given price; and since many people—from big and medium-sized mine operators to "sharecropping" miners themselves—had gold and silver to sell,[24] they could not keep from passing along these savings to European buyers. Meanwhile, colonial legislation greatly reduced competition among those bringing European and Asian goods to exchange for precious metals—and at least attempted to restrict production of local alternatives to these imports. Thus both the scale of this trade and the prices at which it

[20] Richardson 1987: 768.

[21] Hamilton 1934; Flynn and Giraldez 1996: 321–29.

[22] Morineau 1985: 102, 121, 289.

[23] Stern 1988: 849–52; Tandeter 1993: 15–85.

[24] Stern 1988: 852–54.

occurred were distorted, making some unknown further portion of gold and silver exports a "gift" to Europe.

Some of this "gift" stayed in western Europe. Those metals probably did little for Europe's economic development, since they financed numerous wars, including Spain's nearly successful assaults on the emerging core economies of northwest Europe.[25] Nonetheless, the metals may have helped grease the wheels of European trade, and they certainly played a role in the growth of more effective militaries. Meanwhile, much New World treasure went further east, bringing other commodities to Europe. It can be roughly divided into three separate streams.

One substantial stream of New World gold and silver exports went to various ecologically rich small market zones in the Old World—from Southeast Asia to parts of the Near East to eastern Europe—making it possible for Europe to expand its imports of real resources from these peripheries. In these cases, silver or (less often) gold were used like modern currency reserves: they were a residual store of value transferred to cover an otherwise unbalanced trade with areas that had limited demand for the goods Europe sold. But one could also see these metals, which were usually coined before transshipment from Europe, as the one European manufactured good for which these zones had fairly large markets and (lacking the proper raw materials) limited local production.[26] In economies that were monetizing rapidly (e.g., much of Scandinavia), this manufactured good was at least partially an item of popular use; in the least marketized peripheries, such as eastern Europe, it was essentially a luxury good. Either way, it made it possible to obtain more primary products from these areas than would have been possible otherwise.

But, since precious metals do not wear out or get used up (unlike cloth, or grain), it was hard to create an *expanding* (or perhaps even enduring) market for them if only a tiny part of the society used them. True, wealthy people could add to their silver or jewelry hoards; but at some point they had enough for all conceivable obligations, and silver as a form of conspicuous consumption must have begun to lose value relative to silk, porcelain, paintings, and so on. Thus, New World silver helped western Europe obtain more raw materials than they could have had the fifteenth-century "bullion famine" continued,[27] but could not by itself indefinitely expand western Europe's trade with less-monetized Old World economies.

The second stream also helped Europe obtain land-intensive goods, but less directly. This flow was exchanged for various Asian (mostly Indian) manufactured products, which then covered much of the cost of procuring slaves for the Americas. Indian cloth alone made up roughly one-third of all the cargo by value exchanged by English traders for African slaves in the eighteenth century and may have made up over half of the goods that French traders (whose industries were slower to produce good imitations of Indian fabrics) used to acquire slaves.[28] Much Portuguese imperial trade went directly from Asia to Africa to Brazil, stopping in the mother country only to deliver New World goods.[29] In other words, this portion of the metals flow facilitated the process we have already described, in which New World slave areas became an important complement to labor and capital rich, land-poor Europe.

In India, as we have seen, there is a strong case for seeing much of the flow of gold and silver coins as meeting a broadly based transactions demand, rather than as a store of wealth that covered a "trade deficit." But despite impressive evidence of ongoing monetization in India, it does not necessarily follow that in the absence of New World metals, India would simply have imported more of other Euro-American goods. Much of the population still only entered the market to obtain a few necessities, meet occasional ceremonial expenses (e.g., for weddings), and raise cash to pay taxes and other dues; and to the extent that they did purchase other goods, it is not clear that European manufactures would have been competitive. And the greater prestige of Chinese fabrics and ceramics, Southeast Asian delicacies, and specifically Islamic goods from the Middle East meant that European luxury goods would not have found a large market either. So even if we treat precious metals flowing to India as just another product, they were probably special in another sense: they were about the only European good that one could imagine India buying on such a huge scale. (The one possible alternative that comes to mind is arms; it is unclear what effect a large further increase in this already substantial trade might have had in the period spanning Mogul decline and British ascendancy.)

Finally, the third stream of metals was for decades the largest of all; but this flow of silver probably did the least to ease pressures on Europe's land. It went to densely populated, heavily commercialized parts of Asia, where it was used as a medium for transactions involving every class in society; and in return, various consumer goods flowed to Europe and to the Americas themselves. This description, as we have seen, may fit some of the Indian trade, but it refers above all to the enormous flow of silver to China, where millions of ordinary people used silver to pay their taxes and for many ordinary purchases.

Here silver was clearly a good, not residual wealth used to settle unbalanced accounts. Indeed, while silver flowed into China between 1500 and 1640, gold and copper left China, often ending up in Europe.[30] And though silk, the most

[25] Flynn 1984: 43.

[26] Perlin (1994: 113–18, 147–74) emphasizes the point that coins in this period are often more usefully thought of as a manufactured good than as "money" that stands opposed to "goods." Perlin (1991: 239–373, esp. 248–49, 268–80) examines the production of coins as goods often designed for remote target markets.

[27] Day 1978: 3–54.

[28] H. Klein 1990: 291.

[29] Subrahmanyam 1993: 183–85.

[30] Flynn and Giraldez 1997: xxvii; Von Glahn 1996: 129–33, 224–29.

important "real good" among China's exports, was a fabric rather than a metal, it, too, was used as money in some places. Thus, New World silver in this trade was just one of many goods being arbitraged: items that were more plentiful in China than elsewhere (gold, porcelain, silk) were exchanged for silver, which was comparatively scarce in China[31] but in very high demand as it became the monetary and fiscal base of the world's largest economy.[32] By about 1640, this trade had brought silver to gold ratios in China and Europe into rough equilibrium; thus, having lost its raison d'être, this trade went into a sharp decline, recovering only in the eighteenth century.[33] In its first incarnation, the trade did little to supply land-intensive commodities to Europe. It had, however, been enormously profitable and yielded goods that (unlike more and more silver) could be used to make exchanges elsewhere.

In China, as in India, it may be difficult to imagine another good that would have been imported on such a massive scale had silver not been available. Thus in this case, too, New World mines were important to Europe's capacity to obtain goods in the rest of the Old World. But the Chinese case differs from the Indian one, from the importer's side, in that it is far harder to see much of the silver it imported as nonessential; thus, in the absence of that flow, we must imagine either other imports of monetary media or a large reallocation of China's own productive resources, perhaps in turn expanding demand for other imports. From the European side, meanwhile, the difference between this flow of metals and that which went to India is that this one did relatively little, even indirectly, to ease pressure on the land.

These distinctions among various uses of New World treasure are post hoc and highly imperfect, and the association of different uses with different final destinations for the metals must be seen as tendencies, not absolute rules. Even in eastern Europe—perhaps the periphery in which the general population was the least involved in the cash economy—not all imported metals represent abstract "wealth" hoarded by the elite in a stagnant economy. At the other end of the scale, there was surely some hoarding of silver even in China. What we need to recognize is that some of this behavior went on everywhere; there are no grounds for the sharp distinction some scholars have seen between western "spenders" and Asian "hoarders."[34] Moreover, the line between hoarding and transactions demand was itself vague in a world in which ordinary people did not have savings accounts, and in which jewelry and other items of display were often a crucial part of securing the marriages that reproduced productive units.

[31] For data on gold/silver ratios in different places, see Von Glahn 1996: 127.

[32] Flynn and Giraldez 1997: xix.

[33] Von Glahn 1996: 128, 232.

[34] For a recent restatement of this alleged difference and its enduring importance, see Kindleberger 1990.



But despite the approximate and fluid nature of these categories, they do show us something: New World metals were not simply "money" that Europeans turned into "real" resources by distributing them around the Old World, with European needs always driving the story. The internal dynamics of other regions could create "needs" no less real than those of Europe, such as China's need for a more usable currency, or the desire of eastern European elites to turn their grain surpluses into something easily stored and shipped and thus usable for provisioning their troops on campaign.[35] It was the *intersection* of European and other regional dynamics that determined the extent and nature of these metals' flows: the world economy remained polycentric, and forces emanating from elsewhere could shape it just as much as those emanating from Europe.

Indeed, as we saw in chapter 4, had China in particular not had such a dynamic economy that changing its metallic base could absorb the staggering quantities of silver mined in the New World over three centuries, those mines might have become unprofitable within a few decades. The massive inflation of silver-denominated prices in Europe from 1500 to 1640 indicates a shrinking value for the metal there even with Asia draining off much of the supply,[36] and the less-monetized parts of the Old World would not have indefinitely kept absorbing precious metals without also devaluing them. This is one more way in which early modern silver and gold were not quite like contemporary "money": today those who have hard currency to spend will never have trouble obtaining more resources, since contemporary peripheries have staggeringly large needs for capital.

Nonetheless, the transshipment of New World metals did allow western Europe to expand its imports of real resources far beyond what it could have obtained otherwise. Some New World silver may have had to have been converted to cloth, porcelain, or spices to keep expanding the flow of resources from some of the less-monetized Old World peripheries; but thanks to Chinese demand, this option was available, too. And as we have already noted, the combination of New World metals themselves, transshipped Asian goods that had often been obtained with silver, and exotica from the New World itself (such as sugar and tobacco) paid for more of western Europe's imports from the rest of the Old World than did manufactures created wholly within Europe.

Thus the distinction that some authors make between bullion extracted through coercion and a far more important flow of real resources obtained through consensual trade seems artificial.[37] Not only were the land and labor that produced New World resource exports very much the fruits of extramarket coercion, but it took the unique arrangements of Caribbean plantations

[35] Blum 1961: 201–4.

[36] Hamilton 1934; Flynn and Giraldez 1996: 323–29.

[37] See, e.g., Jones 1981: 83–84.

and of mercantilist policies throughout the New World to escape all the forces that caused core-periphery exchange within the Old World to plateau. Without these features, and without silver that helped pay for colonial administration and provided for Asian goods to be transshipped to Africa and the Americas, it is hard to see how the "ecological windfall" could have found its way to Europe in such quantities; nor is it clear how Europe could have obtained as much ecological relief from the rest of the Old World as it did.

## Some Measurements of Ecological Relief: Britain in the Age of the Industrial Revolution

The quantities involved were vast,[38] but to discuss them usefully they must be broken down a bit. For argument's sake, let us eliminate goods that could have been obtained from Old World peripheries without major institutional changes (e.g., furs, which Russia presumably could have exported in larger amounts) and gains from Old World adoptions of New World plants such as the potato (without which neither Ireland nor Prussia could have exported grain to England). The New World's huge fisheries, for which North American landfalls were convenient but not essential, are also best left out. These belong to the New World windfall in some loose sense, but if we cast our net too widely, we are simply counting traffic across the Atlantic rather than showing that these exchanges (much less any particular mechanism behind them) were essential. So for the eighteenth and early nineteenth centuries, the discussion will focus almost exclusively on sugar and cotton, with some reflections on the larger torrent of primary products that came from the Americas in the mid- and late nineteenth centuries.

Mintz estimates that sugar made up roughly 2 percent of Britain's caloric intake by 1800, and a stunning 14 percent by 1900.[39] In fact, the real figures would appear to be even higher. Using the same estimates of per capita sugar consumption as Mintz does, and the same conversion into calories, the per-person, per-day consumption of sugar for the United Kingdom (including Ireland) comes to over 90 calories in 1800. If the average Briton consumed 2,500 calories per day in 1800 (a generous estimate),[40] then 90 calories is almost 4 percent of total intake even at that early date; the average 1901 sugar intake

[38] For methods of calculation throughout this section, see appendix D.

[39] Mintz 1985: 133.

[40] Clark, Huberman, and Lindert (1995: 223) assemble various surveys of per capita consumption in workers' households and come up with estimates as low as 1,500 calories *per adult male equivalent* (for a sample of the rural poor in 1787–96) and as high as 2,400 (for urban workers in 1863 and 1889–90), plus one estimate of 3,200 for rural workers in the 1860s; but even the latter figure would translate into less than 2,500 calories per person.



would have yielded over 18 percent of total calories if people really averaged 2,500 calories per day, and over 22 percent if they averaged a more likely 2,000. And although today sugar is often derided as a source of "junk" calories, it can be valuable in poorer diets, preventing scarce protein from being burned for energy.[41]

The 4 percent figure for 1800 may seem modest, but it is worth recalling that an acre of tropical sugar land yields as many calories as more than 4 acres of potatoes (which most eighteenth-century Europeans scorned[42]), or 9–12 acres of wheat.[43] The calories from the sugar consumed in the United Kingdom circa 1800 (using figures from Mintz[44]) would have required at least 1,300,000 acres of average-yielding English farms and conceivably over 1,900,000; in 1831, 1,900,000 to 2,600,000 acres would have been needed. And since the land that remained uncultivated in Europe (and especially in Britain) by this time was hardly the continent's best, we could plausibly make these numbers still larger.

Dried meat, plus ships, wood-based naval stores, and small amounts of timber and grain spared some land in the late eighteenth century and a good deal in the early nineteenth century. North American timber exports to Britain, for instance, were trivial before 1800 (though exports to southern Europe were not); but by 1825, they were large enough to replace the output of over 1,000,000 acres of European forest and soared thereafter.[45] Some savings also came indirectly, as New World silver and reexports paid for much of Britain's Baltic timber imports (which replaced the output of about 650,000 acres per year in the 1780s and 1790s). Given that the total arable land of Britain was roughly 17,000,000 acres,[46] the 3,000,000–4,000,000 New World "ghost acres" found so far are a non-trivial addition to Britain's land base, even without cotton—and before the much, much larger boom in American imports in the mid-nineteenth century.

By 1815, Britain imported over 100,000,000 pounds of New World cotton; by 1830, 263,000,000 pounds.[47] If one replaced this fiber with an equivalent weight of hemp or flax, the extra acreage needed would be comparatively

[41] Daniels 1996: 277.

[42] Braudel 1981: 170; Salaman 1949: 479–84.

[43] Mintz 1985: 191.

[44] Mintz refers here to "Britain," but since his figures match those both Deerr and Mitchell provide for the U.K., he probably meant the U.K. as well; for his purposes, it would make little difference. And since, as we have seen, England from 1770 on drew heavily on food supplies from Wales, Scotland, and Ireland—supplies that would have been reduced had those places not had some other way to meet minimum caloric needs—the U.K. figures are what we need to use for estimating the Caribbean contribution to feeding industrializing England.

[45] For methods of calculation, see appendix D; export figures from Lower 1973: 259.

[46] Mitchell 1988: 186. The figure is actually for a later date (1867), but it is the earliest one available and seems to have been fairly stable at that point.

[47] Mann 1860: 112.

modest: 200,000 acres in 1815, 500,000 in 1830. But hemp and flax—especially hemp—were both considered inferior fibers for most purposes, were much more difficult to work with, and processes for spinning them mechanically emerged later than that for cotton.[48] More important, both hemp and flax were extremely labor-intensive and manure-intensive crops: so much so that most people only grew them as garden crops. Even three centuries of government schemes and subsidies had failed to promote larger-scale production in either England or North America.[49]

This leaves wool, long Europe's main clothing fiber. But raising enough sheep to replace the yarn made with Britain's New World cotton imports by would have required staggering quantities of land: almost 9,000,000 acres in 1815, using ratios from model farms, and over 23,000,000 acres in 1830. This final figure surpasses Britain's total crop and pasture land combined. It also surpasses Anthony Wrigley's estimate that matching the annual energy output of Britain's coal industry circa 1815 would have required that the country magically receive 15,000,000 additional acres of forest.[50] If we add cotton, sugar, and timber circa 1830, we have somewhere between 25,000,000 and 30,000,000 ghost acres, exceeding even the contribution of coal by a healthy margin.

Extracontinental imports also reduced per capita food needs by changing habits, as discussed in chapter 5; this might increase our land-savings calculation significantly, but it is probably uncountable. Cheaper home heating was, of course, largely attributed to the surge in coal output. But having far more people work indoors—rather than following the "Jiangnan" or even the "Danish" route to ecological survival—was crucially dependent on *both* cheap coal-based energy and overseas supplies of cotton, grain, and other land-intensive imports; and indoor laborers appear to have consumed about one-third fewer calories per capita than outdoor ones.[51] The unprecedented amounts of cheap cloth that helped preserve warmth and further reduced caloric needs was unimaginable without American cotton. And insofar as caloric needs were also reduced by the appetite-suppressing qualities of tea and sugar, this was another hidden savings achieved in part through coercion abroad. Most sugar came from New World plantations, while tea was paid for first with New World silver and then with Indian opium. These factors together would

[48] Mokyr 1990: 103.

[49] See Warden (1967: 32–40) on England and its colonies.

[50] Wrigley 1988: 54–55. Wrigley actually makes "the death of George III (1820)" his cut-off date, but according to the coal production statistics in Mitchell (1988: 247) it would be 1815 when production actually reached the requisite 15,000,000 tons. More important, Wrigley's estimate that an acre of woodland produced two tons of dry wood a year is, as he notes, probably generous, and biases his estimate of coal's impact downward. Were he to use the contemporary global mean as Smil does (1983: 36) and as I have elsewhere, his estimate of the impact of coal would rise to slightly over 21,000,000 "ghost acres."

[51] Clark, Huberman, and Lindert 1995: 223 vs. 226.



add significantly to the "ghost acreage" even in the early nineteenth century and enormously in the middle and later years of the century.

Of course, the southern United States is not the only place where cotton will grow; but without that area, the early growth of Manchester would have faced very serious impediments. Some sense of how much more difficult it would have been to sustain a boom in cotton textiles without this area's particular ecological and institutional heritage can be gained by looking at the so-called cotton famine that occurred later, during the American Civil War.

Though American cotton exports were cut off only between 1862 and the middle of 1865 (during 1861 the North did not yet have an effective blockade), Britain had begun by 1850 to make considerable efforts to increase cotton supply. These efforts were almost certainly far greater than Britain would have made to find cotton supplies in an imaginary world in which U.S. exports were not available in the first place. British power was far greater at this point than it had been at the beginning of the century, and the shipping and other relevant technologies available to it were far superior. Perhaps more important, the existence of numerous mills, huge numbers of workers, and existing customers expecting products created far greater incentives to avoid a diminution of cotton supply than the imagined possibility of building such an industry could ever have created for overcoming an initial lack of cotton. Yet in spite of these efforts, "the supply of raw material . . . prov[ed] obstinately inelastic."[52]

The major focus of British efforts was India. The Indian government was pursuing a "cotton-oriented policy of annexation and railway construction" during the 1850s but with little to show for it for the first decade. A big jump did occur in 1861—much of it at the expense of domestic consumption and shipments to China rather than by expanding output—but Indian shipments were still less than half of U.S. shipments to Britain in 1861. Moreover, exports rose only 8.6 percent further after this, even though this was when the Union blockade became effective and cotton prices soared.[53]

The other relative success—with far less outside effort—came in Egypt. This was possible because the Egyptian government itself had been committed to expanding cotton output since the days of Mohammed Ali: once the mills he had ordered built proved uncompetitive, the cotton crop was available for export. Exports began in 1821, passed 27,000,000 pounds in 1824, and almost 50,000,000 pounds by the 1850s;[54] but this was less than half of what U.S. exports had been as far back as 1815. At its peak, Egyptian exports approached 200,000,000 pounds (still well short of those of the United States in 1830) before falling back very sharply.[55] These short-lived achievements came after forty years of intense pressure from above—indeed until the Civil War, Egyp-

[52] Farnie 1979: 136.

[53] Ibid., 137, 142, 145–46, 151.

[54] Issawi 1966: 362, 416–17, measurement conversion from 518.

[55] Ibid., 417.

tian cotton cultivation did not spread much beyond the estates of Mohammad Ali and his relatives—engineered by a regime that had been inspired by the example of Lancashire's success. Despite this long preparatory period, they did not represent a sustainable level of production, much less one capable of further expansion. Nor did they provide the cotton at a price Lancashire could have lived with for very long.

During the U.S. Civil War, about 40 percent of the Nile Delta was growing cotton in any given season; given the rotations being used, it appears that cotton was grown in every delta field at some point between 1863 and 1865.[56] Given the limited amount of well-watered land in Egypt, this probably represented an absolute maximum of possible cultivation without the kind of irrigation made possible by twentieth-century mega-projects. Even on this land, costs of cultivation quickly rose to levels that were profitable only at the absolute peak of prices in 1864;[57] and at those prices (in fact, even at the lower ones of 1862), raw cotton was actually more expensive than coarse yarn.[58]

Britain's less-focused efforts to stimulate exports from other promising-sounding sources—Brazil, west Africa, Queensland, and Burma—produced almost nothing,[59] even though prices soared. British cotton consumption fell 55 percent between 1861 and 1862, while prices (already up in 1861 because of the war) doubled. In relative terms, cotton had cost about one-third the price of wool in 1860, but cost more by 1864.[60] Prices would no doubt have gone higher still were it not that when the Civil War began, there was both a fairly large supply of stockpiled raw cotton and a huge glut of finished cotton goods in warehouses (thus depressing demand for more spinning and weaving).[61] Employment in Lancashire mills fell by roughly half in 1862, and the remaining operatives were working two and a third days a week by November (versus six days in 1860–61);[62] large numbers of firms (especially smaller ones, who more closely resembled the early mills in terms of cash reserves, equipment, and other resources) went bankrupt.

True, even this inadequate supply of raw cotton was well above what the United States had supplied in the early nineteenth century; but, as we have seen, it also resulted from efforts that would have been inconceivable at that time. And without twentieth-century farming tools, a substitute for the later and greater bonanza of food crops from the "neo-Europes" is considerably less likely still; there simply was no place in the Old World with anything like the same combination of ecologies that were better for European food plants than Europe itself, relatively sparse population and favorable institutional structures.[63]

[56] Owen 1966: 424.
[57] Ibid.
[58] Farnie 1979: 145.
[59] Ibid., 150.
[60] Ibid., 147, 162.
[61] Ibid., 138–39, 144–45.
[62] Ibid., 145–46.
[63] See, generally, Crosby 1986.



## Comparisons and Calculations: What Do the Numbers Mean?

One might object to these calculations in ways that parallel a common response (discussed in chapter 4) to arguments about overseas extraction and European capital accumulation: how can we call something decisive if other factor(s)—capital accumulation within Europe, domestic supplies of food, or whatever—were larger? The question is important, both for this particular case and for conceptualizing historical processes more generally.

If we are largely concerned with growth accounting for a single case, smaller factors are minor factors. But even here, problems of categorization arise. "New World farm goods imported to Britain" as an inclusive category may look small next to a parallel category of "domestic (British) farm production," and "imports from the rest of Europe," but if we break these categories down further ("food imports from Germany," "timber imports from Scandinavia," etc.) we find that some New World subcategories, such as "fiber imports from the United States," would be among the largest items on this longer list of elements. And how narrow we make our categories depends on complex judgments (and some further counterfactuals) about the substitutability of different products, the importance of particular sectors for the larger economy, and so on. (This is one reason why New World resources seem more crucial than New World profits: there were clearly alternate investments that could yield money, but it is less clear that there were alternate ways to get huge amounts of land-intensive goods.) Thus, unless we want to make a categorical statement that there are *always* substitutes for any particular thing, and markets *always* accurately measure the relative importance of activities, goods, etc., such judgments cannot be avoided. (To see some limits to these assumptions, imagine that martians suddenly deprived the earth of all its fossil fuels. We could estimate the impact by looking at the fairly small percentage of world GDP that currently goes to fossil-fuel producers, but the actual impact would certainly be greater.)

More generally, there are clearly some situations where a fairly small increment in something makes all the difference. Human genes are 98.4 percent identical to those of pygmy chimps,[64] but few of us would disqualify an explanation of why humans have spread across almost the entire planet (while chimpanzees survive in just a few pockets) because it focused too much on the behaviors made possible by the remaining 1.6 percent.

The basic idea that relatively small differences can create large historical divergences is both proverbial ("For want of a nail . . . ") and modern (as in the

[64] Diamond 1992: 23.

famous "chaos theory" example of a butterfly beating its wings in Africa and changing the weather in Greenland). It cuts against equilibrium-seeking models, in which small differences should not create large *and lasting* divergences. It thus makes for an awkward marriage between history and economics—at least schools of economics that posit a single equilibrium as the destination toward which a given system tends. Accepting the importance of small factors can also lead to intellectual anarchy. Explanations can become so cluttered that we can not grasp them; or they can become a grab bag, with everybody championing as "crucial" the factor that suits their personal agenda. But for history to matter, there must sometimes be factors with lasting effects larger than their size might suggest.

Arguing for such factors based on comparisons rests in part on how clear it is that the cases being considered are otherwise similar. History is never as neat as the chimpanzee/human case, in which 98.4 percent of the genes are absolutely identical. Instead, we have statements of rough similarity, or of advantages that seem closely tied to some off-setting disadvantage, or where it is hard to think of any mechanism that would have greatly magnified the importance of a particular difference during the period in which the larger divergence emerged.

Thus, how important coal and the New World will seem depends partly on how convinced readers are of the similarities I have suggested in other areas, as well as on the arguments about those particular phenomena. As for those phenomena themselves, I would suggest four reasons to give them special weight:

**1.** the calculations above show they were not small relative to some reasonable standards (e.g., Britain's domestic land base)

**2.** they appear at the right time to explain a crucial divergence (once we have pushed the date of that divergence back to the century surrounding 1800)

**3.** they affected development through relieving a constraint—the finite amount of land—which was otherwise very difficult to relieve within the knowledge base and institutions of the time

**4.** the examples of core regions in China, Japan, and certain parts of Europe itself (such as Denmark) provide plausible examples of how societies lacking these advantages might have looked.

They do not require us to imagine that without this relief, Europe would have suffered a Malthusian catastrophe: a situation akin to the "butterfly wings yield hurricane" scenario or to imagining that with a slightly longer ecological window, India, China, or Japan would have produced an industrial revolution. A European ecological crisis *could* have happened, but our counterfactual allows us to imagine a variety of more likely outcomes, which have in common a set of labor-intensive adjustments to land pressures that actual people in some-



what similar circumstances made successfully but would not have led to anything like the British breakthrough. Indeed, as we shall see in our last section, these labor-intensive paths may have also made it harder to imitate industrialization even once the technology was there for the copying. Thus, highlighting the factors I have chosen seems to me a reasonable, rather than reckless, invocation of the principle that not so large initial difference can lead to vastly larger future ones.

## Beyond and Besides the Numbers

Having introduced the idea of dynamic effects not easily captured by equilibrium models or quantitative measure more generally, let us look briefly at some of these ways of relating the New World to Europe's divergence from the rest of the Old World. We have touched only briefly (in chapter 3) on the dynamic cultural effects of New World exports such as tobacco and coffee—in particular, their influence on consumption habits and incentives to produce for the market. Though not significant in the sorts of ecological calculations we have made, these "unnecessary" goods—and others obtained in Asia with the use of New World silver—no doubt did much to speed the "industrious revolution" so crucial to Europe's economic dynamism.

For one thing tobacco, sugar, cocoa, coffee, and tea were all somewhat addictive, easy to prepare and consume quickly, and provided short bursts of energy. This made them perfect for punctuating long work days, especially away from home: these characteristics became more important as home and workplace were separated, especially in the factory age. (In Britain in particular, the New World silver that financed the partial substitution of Chinese tea for gin and beer may also have done much to create a population better suited to rapid, sometimes dangerous work.) Moreover, these new "everyday luxuries" were all (except for tobacco) commodities that did not grow in Europe and thus could never be made within the household; consequently, they could only be obtained through producing for the market. The same was true for those desiring cotton or silk fabrics, or the popular blends thereof; and the same was true for the silver belt buckles and other small adornments that became important status symbols even among poor people.

Not only did these materials have to be purchased but in many cases their cost was an incentive to specialization. A family that might have made its own clothes out of hemp or flax would be less likely to risk ruining a fancier piece of fabric; and one would have to be quite wealthy to be willing to write off all the fabric that would be wasted in the process of training a youngster to work with silk, unless this was going to be how they made their living. Consequently, the exotic commodities that became parts of many ordinary people's lives in this period may have contributed in important though unquantifiable

ways to the reallocation of labor time from production for home use to production for the market, which in turn was crucial to Europe's "internally generated" gains from increased division of labor. We have also left to one side the possible significance of the plantations themselves as laboratories for factory organization, as suggested by Sidney Mintz.[65]

Moreover, we must remember that New World treasure did more than just allow Europeans to *buy* additional goods in other parts of the New World. It also helped create European military commanders and paymasters who became influential partners of local elites and often later their colonial masters.[66] Consumption taxes on plantation-grown sugar and tobacco, as well as other colonial goods, also played a significant role in building these military capabilities. Half the increase in British government revenues (in constant prices) between 1670 and 1800 (or 1810, if one prefers to take in more of the Napoleonic Wars) came from customs revenue; and at least in 1788–92, two-thirds of customs revenue came from the duties on tea, sugar, Indian cloth, raw silk, tobacco, and "foreign spirits" (mostly rum made with Caribbean sugar—this category did not include wine).[67] Together, customs on these particular commodities made up 22 percent of the yield from all major taxes in Britain during these years.[68] And, of course, the various East India Companies, which lived off these trades, carried out many of the early European conquests in Asia themselves.

It is also worth noting that while growing military power allowed late eighteenth- and early nineteenth-century Europeans to take advantage of political instabilities in various parts of Asia, Europe was having internal upheavals of its own.[69] Jack Goldstone has drawn plausible connections between European political instability in both the mid-seventeenth and late eighteenth centuries and population-induced resource shortages and price shifts.[70] In that light, the resources from abroad loom larger, having kept these problems from being still worse. The same could be said of the state revenues gained from New World commodities, since these taxes were far less unpopular than those on domestic products and assets. This looks still more significant when we remember that Britain had a relatively smooth passage through the Age of Revolution, which for much of the continent involved major economic setbacks, and that it emerged from the period with a vastly enlarged empire.

Thus, it seems likely that the exploitation of the New World, and of the Africans taken there to work, mattered in many ways above and beyond those

[65] Mintz 1985: 46–61.

[66] Bayly 1989: 74; Washbrook 1988.

[67] Calculated from data in O'Brien 1988: 15.

[68] Calculated from ibid., 11.

[69] Bayly (1989) provides an excellent account of the importance of political crises rooted in commercialization that shook Muslim empires from north Africa to Java in opening the way for a new wave of European imperialism and notes general similarities between these crises and the "general wreck of nations" that Europeans found closer to home.

[70] Goldstone 1991 passim.



reflected in our ghost acreage figures. Taking all the indices together, it seems likely that this exploitation did more to differentiate western Europe from other Old World cores than any of the supposed advantages over these other regions generated by the operation of markets, family systems, or other institutions within Europe. Only three strong candidates would seem to exist for a factor of comparable importance in differentiating western Europe from at least east Asian cores. One, paradoxically, would be Europe's ecological "advantages of backwardness," which left unexploited resources that then provided ecological breathing room in the nineteenth century. We have seen, however, that these advantages did not extend to Britain (or to the Low Countries) or to some crucial commodities (notably fiber crops and wood), and they were offset by ecological disadvantages. The second possibility would be the fortunate location of Britain's coal deposits and its relationship to the development of the whole coal/steam complex. The third would be the wave of industrial innovations themselves—something still not fully understood and, as we have seen, of vastly greater significance because it was combined with both plentiful coal and the easing of other resource constraints made possible by the New World.

In this book's last two sections, I follow up the idea of fateful divergences in two ways. First, I carry the argument about the importance of the New World for European development further into the nineteenth century, briefly sketching how these dynamics both changed and continued as industrialization spread beyond Britain. Finally, I look back at China, Japan, and India, all places which, to varying degrees, had to adopt increasingly labor-intensive approaches to ecological stresses and to varying degrees found that these adjustments made capital-intensive, energy-intensive industrialization more difficult later. Since I have argued repeatedly that without the windfalls discussed here, Europe, too, could have been forced down a much more labor-intensive development path, these last examples are meant not just to round out a global story, but to complete the argument that the early nineteenth century represents a crucial moment of divergence with lasting effects—the moment when, thanks to all the factors we have discussed, England avoided becoming the Yangzi Delta, and the two came to look so different that it became hard to see how recently they had been quite similar.

## Into an Industrial World

Land-saving New World imports would only grow in significance after 1830: for decades they kept pace with the stunning progress of fossil fuels. Britain's coal output would increase fourteen times from 1815 to 1900,[71] but its sugar

[71] Mitchell 1988: 247.

imports increased roughly eleven-fold over the same period,[72] and its cotton imports increased a stunning twenty-fold.[73] Meanwhile, Britain also began to live off American grain, beef, and other primary products; lumber imports soared; and the New World, at last, also became an enormous outlet for Europe's surplus population.

In the early nineteenth century, of course, Britain ceased selling slaves to North America and the Caribbean, and it had never sold many to Argentina. But by mid-century, new technology had made possible still larger declines in transatlantic shipping costs than in the eighteenth century, and other changes (particularly the railroad) were revolutionizing inland transport. This greatly accelerated the process discussed above, in which falling transport costs allowed European emigrants to cover their costs of passage, start-up, and manufactures by sending primary products back to Europe from ever larger parts of the Americas. (The growth of an independent U.S. government, much less concerned with getting back what it spent to secure and develop the frontier than were earlier for-profit colonial companies, also accelerated the process.)

By that time there were also mechanical (as opposed to human) capital goods that New World producers wanted from Europe and at least some patent protection for the designs. Meanwhile, cheap transport, mechanized production, and tastes brought by European emigrants meant that Europe could also now sell large amounts of consumer goods in the New World. With large inflows of capital and labor in the straightforward forms of immigrants and investment, as well as in the indirect form of manufactured goods, the land-rich, market-oriented United States were a perfect complement to an increasingly densely populated and industrial Europe.

Yet even with all these changes, at least Britain was still indirectly dependent on coercion to finance a good part of its nineteenth-century surge in imported New World resources. In fact, even at the height of its reputation as "workshop of the world," Britain rarely sold enough in the Americas to balance its transatlantic imports.[74] The situation got worse as import substitution proceeded on the European continent and North America and eventually created industries that competed in export markets as well. Consequently, European colonialism and overseas coercion—now concentrated in the Old World—continued to matter for many decades, if not as much as before 1850.

Indeed, in the last four decades before World War I, Britain balanced what had become very substantial trade deficits with the Americas and continental Europe—even after figuring in such "invisibles" as shipping, insurance, and

[72] Calculated based on Mitchell 1988: 709–11.

[73] Compare Farnie 1979: 7; see Mitchell (1988: 709–12) on sugar consumption and (1988: 196–201) showing no significant domestic production until the 1920s; and Bruchey 1967: table 2-A.

[74] See Latham (1978b: 69) and Hobsbawm (1975): 138, 144–45) on the trade balances; see Platt (1972: 4–5) on limits of British markets in Latin America.



interest payments—largely through huge surpluses with Asia. By far the biggest surplus was in Britain's trade with India, where legislation artificially enlarged its markets for everything from cloth to locomotives; and India in turn still financed much of that deficit through exports of opium to China and of various farm goods such as tea and indigo produced under highly coercive circumstances for export to continental Europe.[75] Meanwhile, Britain's ability to sustain large deficits with its Atlantic and continental European trading partners while still exporting large amounts of capital mattered to more than just British consumers: it also aided the next wave of industrializers, particularly the United States, who could protect their own markets, sell in an unprotected market, and receive large capital inflows.

It is true, as Eric Jones has argued, that not just any group of people stumbling on the New World (and depopulating it, as any people bearing Old World diseases would have done) could have used these continents as Europe did; but the European entrepreneurship Jones points to[76] was not the *unique* part of the equation, or one in which western Europe had surpassed developments in other densely settled parts of the globe. Western Europeans' innovations in organizing for exploration and durable conquest and in creating institutions that combined entrepreneurship with intense coercion—plus favorable global conjunctures shaped by everything from Amerindians' vulnerability to smallpox to the massive supplies of New World silver and the equally massive project of Chinese remonetization—gave them much of their edge. This, in turn, gave western Europeans a privileged position from which to endure the last century of the "biological old regime," with its multiple ecological challenges, and even continue expanding industries (from textiles to brewing to iron) that made great demands on the products of the land.

## Last Comparisons: Labor Intensity, Resources, and Industrial "Growing Up"

Thus when coal, steam, and mechanization opened up vast new technical possibilities, western Europeans (especially in England) were in a unique position to capitalize on them. Vast untapped New World resources (and underground resources) still lay before them, essentially abolishing the land constraint. Moreover, what they had already gained in the New World meant they entered the nineteenth century with a higher standard of living than they would otherwise have had, enlarged military capabilities (which could force open markets in some cases and impose monopolies in others), and far more extensive handicraft industries than they could otherwise have maintained. And it was from

[75] See Latham 1978b 69–70, 80, 89; Farnie 1979: 325; Hobsbawm 1975: 149.

[76] Jones 1981: 84.

these proto-industrial workers, not directly from the peasantry, that most early factory workers came.

The importance of a factory workforce drawn heavily from people already working in proto-industry is brought out very clearly in Joel Mokyr's "growing up" model of European industrialization. First, despite numerous attempts to find "surplus labor" in agriculture—i.e., workers who could be removed from that sector without appreciably affecting production[77]—such cases seem rare, even in today's Third World;[78] and none of our cores could afford to have their agricultural output fall very much circa 1800. Second, factories employing former proto-industrial workers have a distinct advantage. If factory workers were drawn out of agriculture, then even if demand for them did not raise wages (in other words, if there *was* surplus labor in agriculture), there would be no reason for that wage to fall; and as the diffusion of mass-production techniques caused the price of the product made by a factory to fall, the firm would encounter declining profits and might have difficulty expanding. (Mokyr assumes that the fixed capital needed is fairly cheap, as is common in early industrialization; and since the raw materials cost roughly the same regardless of the production process, the factory's wage bill is the most important variable cost.) But if the nascent industry can draw on proto-industrial workers who made the same product as the factory did, then the same technological diffusion that places downward pressure on the factory's prices also depresses workers' alternate earnings possibilities. Thus the factory can reduce wages and still attract recruits from this sector; this allows it to maintain higher profits for longer.[79]

Thus, in this scenario, industry can result from the "growing up" of proto-industry; it does not require a *simultaneous* social and technological transformation that enables agriculture to maintain or increase output from about the same amount of land while releasing a huge number of workers. Moreover, proto-industrial workers often moved to the factory with some relevant skills and/or knowledge useful for making further innovations. All this suggests that the continued growth of proto-industry in the decades preceding and overlapping the growth of mechanized industry left Europe in a far better position than if it had been compelled to keep more people in agriculture and forestry.

To put things slightly differently: Europe's expansion of both proto-industry and many early mechanized industries required more agricultural output. Quite aside from whether Britain (or even Europe more generally) could have found enough land at home to resolve these problems, putting large additional amounts of labor into supplying these farm goods directly would have created

[77] Lewis 1954: 139–91; for later literature, see Myint 1958: 317–37.

[78] Schultz 1964: 61–70.

[79] Mokyr 1976: 132–64.



further problems later on. But instead, Europe acquired many of these supplies by having others grow them, while putting its own labor into additional soldiers, sailors, traders, and producers of manufactured goods. As factories at home needed more labor, they could draw on proto-industrial workers, with the advantages discussed above.

Over time, soldiers and sailors became more effective per capita thanks to technological change (e.g., better guns and ships) and were increasingly supplemented or replaced by "natives" hired with the proceeds of colonial taxation. Thus the overseas sector went through a sort of "growing up" of its own, which meant that this way of obtaining primary products did not absorb increasing amounts of European labor. The massive expansion of agriculture at home, which would have been needed otherwise, would have been not only ecologically difficult, but hard to reconcile with the expansion of the industrial workforce. When Britain's agricultural workforce finally began to decline in absolute numbers after 1850, it was tied both to technologies that had been unavailable earlier in the century and to massive increases in agricultural imports; production held steady as labor inputs declined, but did not rise much.[80] The contrast to the atypical (for Europe) case of Denmark, discussed in chapter 5, is striking. There, a near-stabilization of the ecology through labor-intensive methods seems to have been inconsistent with industrialization for many decades, even though the marginal returns to much of this work—and the real wages of both urban and rural laborers—were low and falling further.[81]

For a long time China and Japan, like Europe as a whole, also found ways to keep expanding their proto-industrial sectors, even without a New World to supply the needed fiber and other land-intensive inputs. These processes also involved some expansion of trade (and of fishing) to relieve local pressure on the land in cores; but compared to the European solution, they involved a greater intensification and expansion of their own agricultural sectors, particularly for fiber production. And by the end of the eighteenth century, that process seems to have been proceeding at diminishing rates and at considerable ecological cost. Japan's population stopped growing by 1750, and while China's continued growing for another century, the percentage of the population in proto-industry likely stagnated or even declined. In all probability, few areas in China that had extensive proto-industry actually underwent significant deindustrialization. What happened instead was that the heavily agricultural areas of China came to make up a much larger percentage of the population by 1850 than they had in 1750.

[80] Thompson (1989: 189) shows that output of food per farm worker rose about 50 percent between 1840 and the early 1900s, but the number of farm workers fell by 25 percent, making a net gain in output of 12.5 percent. Moreover, even those gains required a massive increase in the use of off-farm chemicals and other products for agriculture (see 193–99).

[81] See Kjaergaard 1994: 160 on wage trends.

The most advanced prefectures of the Yangzi Delta, which had roughly 16–21 percent of China's population in 1750, were barely 9 percent of the empire by 1850, and about 6 percent by 1950. As we shall see shortly, the percentage of these prefectures' population that worked in proto-industry may have fallen slightly, but whether or not that happened, the empire's most proto-industrial region simply ceased to have the same weight in aggregate figures. In Lingnan, the second most proto-industrial macro-region, population growth between 1750 and 1850 was about 75 percent, but China as a whole grew about 100 percent; moreover, a disproportionate share of Lingnan's growth was in Guangxi, a province largely limited to agriculture and forestry.

Thus, even though some of the heavily agricultural macro-regions were becoming more proto-industrial, their very large share in post-1750 population growth meant that China as a whole was at least as agrarian in 1850 as in 1750 and not much less so in 1950. Moreover, proto-industrial workers scattered across the farmsteads of the interior and often seen as part of an ideal agrarian household were not as easily available to move into hypothetical factories as true proletarians with no ties to the land might have been. Thus, during the two centuries or so after 1750, China became less well positioned for industrializing along the relatively easy path of "growing up" and has instead had to deal with all the problems of drawing most of its factory workers directly out of agriculture.

The United States, however, is an important reminder that not all early industrializers had large proto-industrial sectors. In fact, Kenneth Sokoloff and David Dollar, comparing the United States and England in the nineteenth century, have emphasized that the much greater seasonality of agricultural work in England slowed the development of factory-based industry. With large numbers of workers available only part of the year, but at wages far lower than what they would have required to leave the land completely, handicraft industry proved a tenacious competitor for factories, and investment in centralized plants, equipment, and supervision was less advantageous than it would have been had the agricultural and industrial workforces been more completely separate. In the United States, by contrast, very favorable land-to-labor ratios meant that farmers could supplement their grain-growing with other activities—animal husbandry, wood-cutting, fruit-raising and land-clearing, for instance—which yielded less per acre but paid well per hour; thus the rural labor force was occupied full-time without much resort to handicraft industries. Thus when factories were built, they could grow still more rapidly than in England (especially grain-growing, handicraft-producing south England).[82]

This argument is persuasive for the two cases of England and the United States. But the American case was radically different from anything in our Eurasian cores. The very favorable land-to-labor ratios meant that American

[82] Sokoloff and Dollar 1997: 1–20.



farms could easily feed a separate industrial workforce as that group emerged (whether from immigration or from rapid natural increase and rural-urban migration). It also meant that these farmers were sufficiently prosperous, even without industrial by-employments, to buy factory goods, even if those goods were made with fairly expensive labor. Long distances and tariffs, meanwhile, helped ensure that European manufactures made with what was often cheaper labor did not capture all of the United States market.

Under those special circumstances, American factories that had to find their laborers among ex-farmers (whether from Massachusetts, Ireland, or Germany) might still, contrary to the "growing up" model, expand more rapidly than English factories. But very few places in the eighteenth-century Old World could have accommodated a huge increase in population that neither raised local farm output nor brought in primary products by producing industrial *exports*; and where rural populations in Old World cores were not available for proto-industry, this was more likely due to very labor-intensive year-round multi-cropping (e.g., in parts of Lingnan) or enormous amounts of work to preserve a fragile ecology (e.g., marling, ditch-digging, and so on in Denmark) than to the sorts of lucrative but land-intensive by-employments that one finds on nineteenth-century U.S. farms.

Thus, Old World cores could not create a factory labor force in the way the United States did. For them, the choice was between pulling people out of full-time proto-industry or out of at least part-time farming. Given that, being able to draw on proto-industrial workers would still seem the most advantageous way to create Old World industrial workforces. This left England far better-off than places like the Yangzi Delta, which lacked peripheral trading partners that would complement it in the way that England's did.

This argument can also be expressed in terms of another feature of Mokyr's "growing up" model of European industrialization. The model assumes that people turn to proto-industrial activities in the first place when the marginal productivity of their labor in agriculture falls below that of proto-industry. (The former starts off higher than the latter, but falls much more rapidly, largely because the supply of land is limited.) Thus, the extra labor beyond a certain point will all go into proto-industry, as long as the area in question can continue exporting proto-industrial products in exchange for food (and, we might add, fiber and timber) without affecting the relative prices of food and handicrafts in the "world" market where it makes these exchanges.

This condition, usually called the "small-country assumption," makes perfect sense for the Netherlands and Belgium, the cases for which Mokyr developed this model—and at one point it also made sense for the Lower Yangzi and Lingnan, and the Kantō and Kinai regions. Although, as we have seen, the Yangzi Delta prefectures imported huge amounts of primary products—35,000,000 people importing 15–22 percent of their food, plus timber, beancake fertilizer, and so on—the hinterlands and marketing networks they drew

on were so vast that the small country assumption still makes sense as a way of looking at the region's trade in the mid-eighteenth century. But as some of these hinterlands, such as the Middle and Upper Yangzi and North China, grew more populous, experienced diminishing returns in agriculture and developed more of their own proto-industry, the terms of trade did shift, to the marked disadvantage of proto-industrial producers.

Though silver-denominated cotton cloth prices fluctuated from year to year, there seems to have been no trend in nominal cloth prices from 1750 to 1850.[83] Raw cotton prices in Canton, for which we have relatively good data, also show no clear trend, though short-term fluctuations were often violent.[84] But silver-denominated rice prices in the Lower Yangzi rose by 40 percent over that same century.[85] That increase alone would have cut the spinning and weaving income of the hypothetical women in chapter 2 by about 30 percent, from 7.2 *shi* of rice in 1750 to 5.0 *shi* in 1850.

Moreover, fragmentary data collected by Kishimoto Mio suggest that in the Lower Yangzi itself, raw cotton prices did rise substantially between 1750 and 1800. Such a finding is consistent with trendless prices near Canton, since transport costs between these two areas fell sharply in the late eighteenth and early nineteenth centuries. It would also be consistent with seventeenth-century patterns, in which the price of raw cotton in the Yangzi Delta seems to have roughly tracked that of rice.[86] If Kishimoto's data are roughly representative for Jiangnan, then the fall in spinners' and weavers' earnings would be roughly 50 percent just between 1750 and 1794 (when her data stop), though they would be falling from a higher starting point. And if we guess that the trend in raw cotton prices followed that of rice over the long haul, the rice-buying power of our hypothetical weaver/spinner would fall 25 percent between 1750 and 1800, and 37 percent by 1840.[87] Measured in salt or probably firewood, they fell further still.

Even these depreciated earnings could still meet the subsistence needs of the woman herself and would be close enough to male agricultural wages (which were also falling in real terms) that China's "gender gap" remained less severe than that in Europe. But they do show a substantial decline in earnings from home-based textile production, even before any competition from machine-made cloth. A woman weaving very high-grade cotton cloth would have escaped these pressures, since its prices nearly doubled over this same century,[88] but these were atypical women who had unusual skills and probably produced fewer pieces each year.

[83] Zhang Zhongmin 1988: 208.

[84] See Dermigny 1964: IV: table 19.

[85] Y. C. Wang 1992: 42, 45.

[86] Kishimoto 1997: 139, 141; Greenberg 1951: 92; Dermigny 1964: IV: table 19. For more details, see appendix E.

[87] See appendix E for more details.

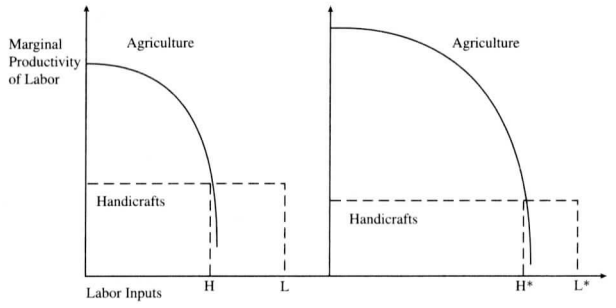
[88] Zhang Zhongmin 1988: 194.



In Mokyr's model, such a fall in returns to proto-industrial labor in the Lower Yangzi should have led to at least some labor shifting back into agriculture at what would previously have been unacceptably low returns, and thus to a combination of further agricultural intensification and some measure of de-industrialization.[89] Though any such shift would have been modest, we have one possible indication of it. Raw cotton from the Lower Yangzi seems to to have become cheaper and more plentiful in Guangzhou (Canton) in the early nineteenth century, much to the dismay of foreign merchants bringing Indian cotton to sell. Though the fall in price may have been largely a matter of improved transportation,[90] the growth in quantity suggests that perhaps less Yangzi Delta cotton was being spun and woven locally; it seems unlikely that Lower Yangzi raw cotton output rose much in this period, and imports from North China were almost certainly falling.

And yet, most Yangzi Delta women continued to spin and weave, even at lower returns; in fact, as we saw earlier, it is precisely in the nineteenth century that references to women of that region working with men in the fields finally disappear completely.[91] If some families were unwilling to move their wives and daughters back into the fields where they would be more visible—and perhaps even tried to increase cloth output to maintain income—the situation might have come to resemble the quasi-involutionary situation described by Goldstone, in which women "stuck" in very low-wage home-based spinning and weaving made it much less profitable to contemplate factory-based textile production. Any such pattern emerging in this period would be the result of a

[89] When graphed, the relationship looks roughly like this:




Time T = 1
Before rise in relative price of primary products

Time T = 2
After rise in relative price of primary products

H, H* = points at which labor switches into handicrafts

L, L* = total labor input

L – H, L* – H* = labor devoted to handicrafts

[90] Greenberg 1951: 91–92.

[91] See Li Bozhong 1996, and above pp. 103–4.

temporary conjuncture, rather than a fundamental feature of long-term Chinese development based on timeless norms (as Huang suggests) and it would be too late appearing to be the basic explanation of the nondevelopment of factories, as Goldstone proposes.[92] Nonetheless it might have helped slow the replacement of domestic textile production by factory production, even once the technology became available, as Goldstone suggests later in his essay. Either way, these women remained part of households in which the men (and to some extent children) were driven to increasingly labor-intensive strategies of farming, fuel-gathering, and land-management—not a promising precursor to industrialization.

Japan's response to similar pressures remained within the same basic framework as China's, but with some differences that may have had long-term implications. First of all, Japan's population broke through its historic ceiling, never to return, earlier than that in either China or Europe. Population reached new heights in the late seventeenth century, when both Europe and China experienced downturns, and by about 1720 it had reached a plateau that would last until about 1860.[93] This long period of zero population growth may represent a more rapid and thorough demographic adjustment to ecological constraints than the slowing, but still positive population growth of early nineteenth century China, but it could also be argued that the adjustment was sharper because the situation was even worse: after all, overall population density in Japan even circa 1860 was still much higher than it was in China.[94] And while the enormous increase in Japanese ocean fishing offered a kind of relief much less used in China (it provided both food and fertilizer), and the early development of systematic silviculture was also an important adjustment,[95] Japan, too, faced serious barriers to further expansion of proto-industry in its core regions.

Agricultural prices rose sharply relative to those of industrial goods during the 1730s, then showed no trend until the late 1820s, when they began another steep climb; the average prevailing level for the 1735–1825 period was about 20 percent above the mid-1720s peak and almost 50 percent above the 1730 trough.[96] I know of no signs of deindustrialization in either the Kantō or the Kinai in response to changing relative prices, but these regions did decline

[92] As I argued in chapter 2 and elsewhere, it is not clear that this particular nondevelopment needs much explanation—it faced many barriers both in China and elsewhere, and the more "natural" path appears to have been an exhaustion of the possibilities of proto-industrialization. What needs explaining is why parts of Europe did not follow this path, too—so that Europe can be seen as China manque (or England as Flanders manque) rather than the whole world being England manque.

[93] Saito 1985: 185.

[94] McEvedy and Jones 1978: 166–71, 179–81; note especially the low percentage of Japanese land that is arable.

[95] Totman 1989: 81–170; Howell 1992: 271–75.

[96] Saito and Shinbo 1989: 91.



in population: 16 percent for the Kantō between 1751 and 1821 and perhaps 5 percent for the Kinai, while the prefectures with impressive population growth were mostly in areas that were still relatively sparsely populated in 1870 and also still well below the national average on Saito's index of rural industrialization. (By contrast, the Kinai region had both a population density and a rural industrialization index that doubled the national averages.)[97] We have already seen that the major growth of both industry and population was in poor domains such as Tosa, where old monopolies were being relaxed; but many such monopolies persisted, as did barriers to migration. These barriers to growth in the peripheries may have spread pressure for family limitation into more peripheries than in China (though any comparison is speculative with current data), ultimately preserving some of the same sort of slack capacity that much of continental Europe had but China lacked. To put it another way, the share of Japan's most advanced regions in national aggregates declined, as it did in China, but much more gently, since peripheral growth was more modest. Labor intensity increased, but this was due almost entirely to increased hours per worker, not to population growth. And though cities and towns lost ground relative to the countryside,[98] the country's still relatively high urbanization rate also suggests that more of what Mokyr calls "pseudo-surplus" labor was stored in handicrafts (as opposed to agriculture) than was the case in China.

As we would expect, the Indian story is different again, but it still fits within the same general framework. Moreover, India's differences from China point in the opposite direction from Japan's differences and suggest more serious long-term obstacles to industrialization. India, as we have seen, began its population boom later than China or western Europe did, and much later than Japan: probably after 1830, and almost certainly after 1800.[99] The nineteenth century saw an enormous increase in cultivated land in India and few signs of serious overall shortages of food, fuel, fiber, or building materials. (Distribution was, of course, quite another matter: India exported large amounts of grain in the late nineteenth century, for instance, while it had serious hunger at home.) But despite a continuation of late precolonial commercialization, the share of India's population in non-farming occupations probably fell during early British rule. The subcontinent underwent what Bayly calls "peasantization," as both formerly migratory peoples and former handicraft workers were increasingly drawn—and pushed—into sedentary farming. The process appears to have begun before colonialism, in part because the competing successor states to the Mughal empire hoped that settling migratory peoples on the land would increase state control, public security, and state revenues; it

[97] See Saito (1985: 211) and compare with Iwahashi (1981: 440).

[98] Sugihara 1997: 153.

[99] Moosvi 1987: 402, 405; Subrahmanyam 1990: 358–60; Habib 1982a: 166–67; Visaria and Visaria 1983: 463–65.

accelerated under the British and touched increasing numbers of former urbanites as well.[100]

An intense debate has been waged about whether India deindustrialized in the nineteenth century; with inadequate data, it is unlikely to be settled.[101] However, it does seem fairly well established that the number of full-time weavers and spinners (especially those based in towns) decreased significantly beginning in the late eighteenth century. This seems to have been due at first to measures taken (especially in Bengal) by the East India Company and some other merchants who increasingly bound weavers to a single potential buyer; as this depressed earnings, many artisans fled their occupation.[102] Later, earnings came under intense further pressure from competition with Lancashire.[103] And the percentage of the Indian population living in cities declined significantly over the long term—from 13–15 percent in the late seventeenth century to 9.3 percent in 1881—though it is currently impossible to date the decline much more precisely.[104] Deindustrialization is also suggested by Habib's finding that the value of sugar, cotton, and indigo grown in India quite likely fell in absolute terms (not to mention per capita terms) between 1595 and the 1870s.[105]

While total yarn and cloth output in India may have held their own, thanks to an increase in part-time rural spinning and weaving, this would not have had the same significance for future industrialization as would the growth of a full-time proto-industrial workforce. These were not people who could later be moved into factories with no cost to agricultural output;[106] nor were they workers whose cost to a potential factory owner would fall together with the unit price of his product, since much of their income came from farming.

Thus, it could be argued, though India began the nineteenth century with a less-monetized economy than that found in China, Japan, or western Europe, it was moving in similar directions and had more ecological room for increasing population and per capita consumption than they did. But by the early twentieth century it had lost that advantage and had both the disadvantages of a densely populated zone and those of a zone with limited proto-industrial development and a limited internal market. This combination of problems had occurred not so much through the sort of (largely) market-driven regional development that seems to have led to China's cul de sac, but through the preferences of colonial (and, to some extent, indigenous) authorities for settled

[100] Bayly 1983: 219–26, 290–92; Bayly 1989: 188–89.

[101] See, e.g., Bagchi 1976; Vicziany 1979: 105–43; Bagchi 1979: 147–61; Perlin 1983: 89–95; Harnetty 1991: 455–510.

[102] Hossain 1979: 326–35; Mitra 1978: 23, 25, 29, 32, 37–38, 48–49, 56, 79–80, 84, 87–92, 132, 144, 164, 172–73.

[103] Harnetty 1991: 463–66, 505–7; Mitra 1978: 188, 194–95.

[104] Habib 1982a: 168–69.

[105] Ibid.

[106] On the absence of true "surplus labor" in Indian agriculture, even in the twentieth century, see Schultz 1964: 61–70.



populations, "customary" law, agricultural and forest exports, and a captive market for the mother country's industrial goods. The result was an *increasing* emphasis on primary-product exports even amid great population growth—primary products often produced with labor that was no less coerced (and maybe more so) than in the least free areas of eighteenth-century India.[107]

Thus, despite considerable growth in agriculture and commerce, India may have become less well positioned for industrial-led transformative growth. Compared to what at least might have happened had eighteenth-century social trends continued a bit longer while population grew and competition from mechanized goods stayed away a little bit longer, colonial India's form of "peasantization" might reasonably be labeled a "development of underdevelopment." The British probably did not frustrate an industrial breakthrough that was otherwise highly likely, as some nationalist scholars claim, but nineteenth-century changes may have made such a breakthrough even more difficult than it would have been otherwise and more difficult than the transition faced by either western European economies or east Asian ones. To put it another way, Japanese and especially Chinese cores may have faced bottlenecks due to the convergence of their peripheries toward "core" profiles, but Indian cores suffered the worse fate of converging toward a more peripheral profile.

The wonder then is that at roughly the same time that the "small-country assumption" became less applicable to east Asian cores—largely because the growth of population and proto-industry in their peripheries was making the quantity of primary products available on their "world" markets smaller relative to their needs—that same assumption remained applicable to Britain even though its population soared and its per capita demand grew (first slowly, then very rapidly after about 1840). Moreover, it remained applicable over the next century, not only to Britain, but to an ever-larger "industrial Europe." Without that wonder the combination of a much larger population, higher per capita consumption, and far *less* labor-intensive land management—all central to the "European miracle"—was not possible. Without that wonder, the achievements of Europe's preindustrial market economy—impressive though they were—could have led in the same direction as the also impressive market economies of other regions. Even that other wonder—the string of technological innovations that makes up the original history of the "Industrial Revolution"—might well have slowed to a crawl without this one.

The wonder can be partly explained by western Europe's own "advantages of backwardness," as discussed in chapter 5: domestic resources left unexploited because of institutional blockages that were only relieved in the nineteenth century and that, at that point, kept the import needs of some industrializing areas from being even larger. But as we have seen, this argument has little applicability to Britain, and little to fiber and wood. Technological

[107] See, for instance, Bayly (1989) on tea plantations.

catching up—e.g., in per-acre yields—also helped, but that alone can hardly explain Europe's surge ahead of the rest of the globe. Europe's wood problem was of course substantially eased by coal, but for quite a while this applied only in Britain and a few other places. Furthermore, overall timber demand kept rising even where coal was used heavily, since wood had many other uses: timber imports continued to rise throughout the late eighteenth century and at an unprecedented rate in the nineteenth century. (Though coal, as we saw, also had other dimensions, through its links to steam power, railroads, and so on.)

Thus, for a more complete explanation of what occurred in Europe's core, we must also look at its peripheries and understand why they became growing rather than shrinking suppliers of primary products to the "world" market. Part of the answer lies in institutional arrangements in eastern Europe and Russia that long inhibited population growth and proto-industrialization of the sort that occurred relatively rapidly in the Chinese interior and Japan's Region II—more "advantages of backwardness," but ones that could not be reaped on a large scale until after 1860. Much of the rest of the answer—and the bridge that got Europe through the first century of the proto-industrial to industrial transition—lay, as this chapter has argued, in the New World: not just in its natural bounty, but in the unique institutions and conjunctures that brought far more of its bounty to Europe far earlier than purely Smithian trade could have.

The institutional factors include some—like the slave trade and the mine labor systems—whose departure from market principles are obvious and which we often consign too quickly to a "premodern" world, forgetting their role in making our world possible. Others, like the corporation, are familiar, "modern," and clearly European in origin. Consequently, we tend to forget that they were created by and for extracontinental encounters and that for a long time they may have been most significant as a method of underwriting the huge fixed costs of violence: a method that then forced these enterprises to increase *volumes* of "exotic" imports (rather than focusing exclusively on profit margins, as the Venetians and Portuguese had tended to do) and thus to expand the European presence abroad. Still others, like the specialized slave plantation, are well known, but their role in creating a new kind of periphery for Europe is here placed in a new light. And beyond these institutions lie various global conjunctures that favored the expansion of the European presence in the New World: from wind patterns and disease gradients to European state competition and Chinese silver demand.

Together, these largely extra-European and nonmarket factors were essential in making transatlantic trade a uniquely self-expanding route by which Europe (especially Britain) could use its labor and capital to relieve its hard-pressed land and thus turn even a demographic and proto-industrial expansion that (unlike in east Asia) far outpaced advances in agriculture into an asset for further development. Without those factors, this demographic and proto-industrial expansion could have been the basis for a later catastrophe; or it could have been stopped by rising primary-product prices in the nineteenth century; or it could have been severely constrained by a need for much more labor-intensive approaches to exploiting and conserving a limited land base.



Thus, forces outside the market and conjunctures beyond Europe deserve a central place in explaining why western Europe's otherwise largely unexceptional core achieved unique breakthroughs and wound up as the privileged center of the nineteenth century's new world economy, able to provide a soaring population with an unprecedented standard of living. Our long journey through interregional comparisons has brought us to at least some resolution of the methodological question with which we began: it has shown that rather than pretend we are seeking the differences among truly independent entities on the eve of industrialization, we must acknowledge the importance of pre-existing connections in creating those differences.