

Are Coal and Colonies Really Crucial? Kenneth Pomeranz and the Great Divergence



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Are Coal and Colonies Really Crucial? Kenneth Pomeranz and the Great Divergence *

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> . . . everywhere we go, there is nothing growing in the ground, just coal and iron. . . .
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> —the Japanese politician Ōkubo, member of the Iwakura Tomomi mission, talking about his visit to Britain in 1871. Quoted in P. Duus, *Modern Japan,* 2nd ed. (Boston, 1998), p. 96.

> . . . a country possessing very considerable advantages in machinery and skill, and which may therefore be enabled to manufacture commodities with much less labour than her neighbours, may in return for such commodities import a portion of the corn required for its consumption, even if its land were more fertile and corn could be grown with less labour than in the country from which it was imported.
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> —D. Ricardo, *On the Principle of Political Economy and Taxation,* ed. by R. M. Hartwell (Harmondsworth, 1971), p. 154.

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Obligatory Reading

Kenneth Pomeranz's *The Great Divergence: China, Europe, and the Making of the Modern World Economy* is an important and excellent book. Any review that would omit to notice this would be a bad one. So let me start by immediately emphasizing its quality. I would be very happy if I had written it myself. It had been forthcoming for a long time, and had already been, even before its final draft, the centerpiece of extensive discussion.[1] Expectations had become very high, and readers will not be disappointed. Kenneth Pomeranz, professor of history at the University of California, Irvine, and author of another highly praised book, *The Making of a Hinterland: State, Society, and Economy in Inland North China, 1853–1937* (Berkeley, 1993), has written a book that will become obligatory reading.

As the flap text puts it, the book is about one of the classic questions of history: Why did sustained industrial growth begin in northwest Europe, despite surprising similarities between advanced areas of Europe and East Asia?[2] After David Landes, Andre Gunder Frank, and Roy Bin Wong, to mention the most well-known scholars who have recently tackled this question, we now have Pomeranz's study.[3] In this review I will on various occasions compare its findings *and* its approach to theirs. I explicitly also refer to his approach because the importance of this book resides not only in its subject and its findings, but also in the specific way in which the author constructs his arguments.

I suspect everybody would agree that the rise of the West can only be satisfactorily analyzed by systematically comparing the West and "the rest." Whereas most authors pay lip service to this ideal, Pomeranz's approach really is systematically comparative. In this he has a big advantage over many of his colleagues. He not only has excellent and firsthand knowledge of the economic history of "the rest," especially

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[1] Kenneth Pomeranz, *The Great Divergence: China, Europe, and the Making of the Modern World Economy* (Princeton, 2000). For early discussion of the book, *see,* for example, the thread on the EH.RES. listserv, EH.R:FORUM: Re-thinking 18th-century China, beginning 19 November 1997.

[2] As a matter of fact, the second half of this question contains a fair amount of special pleading, as not everybody would agree there were so many similarities.

[3] Andre Gunder Frank, *ReOrient: Global Economy in the Asian Age* (Berkeley, Los Angeles, and London, 1998); David S. Landes, *The Wealth and Poverty of Nations: Why Some Are So Rich and Some So Poor* (New York 1998) and Roy Bin Wong, *China Transformed: Historical Change and the Limits of European Experience* (Ithaca and London, 1997). For a review of these books, *see* David B. Buck, "Was it pluck or luck that made the West grow rich?," *Journal of World History* 10 (1999): 413–30.

China, but also managed to become very knowledgeable about recent literature on the economic history of early modern Europe. In short, he is up to date with regard to all regions he wants to compare, and if need be gathers his own, new empirical material.

There is one comment on his comparative approach that I would prefer to make straight away. To me it is not completely clear what exactly is compared to what. The title is quite explicit. The book will be about China and Europe. Reading the text, however, "Europe" appears to be an abbreviation of "northwestern Europe." So one might expect the author to focus on a comparison between China and this part of the Old World. He indeed often does. But already in the very beginning of the book he also stresses the fact that, in any case until about 1850, it was only Britain that industrialized and not Europe.[4] He nevertheless often uses "Britain" and "Europe" as interchangeable categories, which makes it rather unclear whether what is said about Britain also applies to the rest of northwestern Europe, or even Europe in its entirety, and vice versa. I will come back to this question of Britain's uniqueness, which of course has very wide-ranging implications for the cogency of Pomeranz's arguments.[5] With regard to the Asian side of the comparison, the focus indeed is on China, but here it is not always clear whether his comments refer to China in its entirety, or only to its core regions, especially the Lower Yangzi delta. His excursions into the history of India and Japan seduce the author to regularly write as if he is comparing Europe and Asia.

Normally studies of the rise of the West are either comparative, and stress, in Mill's terms, "agreements" and "differences," or integrative, and then focus on connections between various parts of a world that is regarded as a whole. Pomeranz tries to combine these approaches. He tries to incorporate "internal" and "external" explanations in one overarching explanatory scheme. His approach is far more "external" than that of Wong, who focuses primarily, and I think in his case rightly, on internal developments. That it pays more attention to connections than Landes almost goes without saying. Landes, in his *magnum opus* tends to completely neglect the role of "the rest" in the rise of the West. Pomeranz regards the part played by Europe's periphery as crucial, without, however, simply rehearsing the kind of analysis that has become stock in trade of the world-systems school. He rec-

[4] *See,* for example, Pomeranz, *Great Divergence,* pp. 6–7, 16, 119.
[5] *See* pages 443–45 of this review article.

ognizes that internal factors in the various regions that are compared often had their own, autonomous role to play. Which means he also keeps a fair distance from Frank's approach that is so global that even the suggestion that industrialization could be regarded as a British or a European phenomenon is rejected.[6]

When it comes to internal factors, Pomeranz like Wong, though less explicitly, pays attention to institutions and their autonomous role. Culture, according to Landes the factor that makes all the difference, receives very short shrift. As a matter of fact, it is hardly discussed at all. His approach can probably best be called "ecological." The way in which societies handled the fundamental problem of scarcity of land and other organic resources, appears as making the big difference. This does not imply that Pomeranz would be something of a geographical determinist. To him ecology is a matter of history. In that, his approach differs clearly from that of Landes, who also discusses ecology in his comparison between "West and Rest," focusing however on climate and illnesses—factors that do not appear in Pomeranz's book—but treats them as structural factors that from the very beginning had negative effects for economic growth and development in "the East," while they soon started to be assets for "the West."[7] Of the three authors with whose books his work is compared, Pomeranz in this regard comes closest to Frank, who describes his own work as an effort at "(global) economic demographic explanation."[8]

To cap it all, Pomeranz's multi-faceted approach and wide-ranging empirical and theoretical knowledge result in a firm thesis that makes sense, is challenging, and can be discussed and tested. The fact that I am not completely convinced ought not to be surprising. What interpretation or explanation of such a complex problem could ever hope to be perfect?

A World of Surprising Resemblances

There can be no doubt that in the nineteenth century a big economic gap existed between Asia and Europe, nor for that matter, that it still exists. To suggest that Asia has caught up, so that the problem of divergence has been reduced to "a mere blip in what was, and is again becoming, an Asia-centered world," is nonsense.[9] Chinese peasants

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[6] Frank, *ReOrient,* pp. 283–94.
[7] Landes, *Wealth and Poverty,* Ch. 2.
[8] Frank, *ReOrient,* pp. 297–320.
[9] *See,* for this thesis, the back flap of Frank's *ReOrient.*

will be surprised to hear that they have become as rich as their Western counterparts.[10] As to when exactly the economic trajectories of Western Europe[11] and Asia began to diverge, and how exactly that happened, opinions are still fiercely divided.

Fundamental to Pomeranz's thesis is his conviction that in the eighteenth century Europe and Asia still were, economically speaking, "a world of surprising resemblances."[12] For that century, on which he presents most data, he cannot find any substantial differences between the wealth of Europe and Asia. Of course, he cannot substantiate this claim by means of firm data on net GNPs per capita of the regions involved. Nobody can. He pleads his case by "circumstantial evidence": by comparing, primarily, life expectancy and consumption patterns. These do not provide him with any reason to think that inhabitants of the most advanced regions of Europe had a longer and better life than their contemporaries in the most advanced regions of Asia. On minor details one may have some doubts with regard to the data and their interpretation, but the main thrust of his argument is convincing. To confine ourselves to China: to me Pomeranz has demonstrated that this country, at least the most advanced parts of it, especially the Lower Yangzi Delta, had a standard of living that was not substantially lower than that of Western Europe.

That may be the reason why this thesis is no longer as controversial as it has long been. Pomeranz is in line with much recent research, not only on China, but also on India and Japan.[13] Not just declared anti-Eurocentrists like Frank, but also Eurocentrists like Bairoch, Braudel, O'Brien, and even Landes, are willing to admit that till the eighteenth, and various scholars would even claim till the beginning of the nineteenth, century there existed something of a global economic parity between the most advanced regions in the world economy.[14]

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[10] *See,* for the immense differences in wealth that still exist between contemporary China and the West, "A survey of China," *The Economist* 8 April 2000, and Robert Benewick and Stephanie Donald, *The State of China Atlas* (Harmondsworth, 1999).

[11] That is what in this review will be meant by "Europe."

[12] What Pomeranz is really talking about are the richest parts of Western Europe and Asia.

[13] *See,* for example, Prasannan Parthasarathi, "Rethinking backwardness in the eighteenth century: wages and competitiveness in Britain and South India before the Industrial Revolution," *Past and Present* 158 (1998): 79–109 and Susan B. Hanley, *Everyday Things in Premodern Japan: The Hidden Legacy of Material Culture* (Berkeley, 1997).

[14] *See* P. Bairoch, *Economics and World History: Myths and Paradoxes* (New York, 1993) pp. 110–10; Fernand Braudel, *Civilisation Matérielle, Économie et Capitalisme XVe–XVIII siècle* (Paris, 1979) III, pp. 460–64; Patrick K. O'Brien, "The study of contrast across Europe," *Itinerario* 23, 3 and 4 (1999): 9–24, 13–24; and Landes, *Wealth and Poverty,* p. 525, note 3.

What sets Pomeranz apart is that he presents so much concrete empirical data, new and old, to support this thesis.

Pomeranz is aware that a critic might retort that doing some "soundings" in the eighteenth century, measuring variables at one specific *moment* in time, does not indicate much with regard to *trends*.[15] Showing that northwestern Europe was not much, if at all, richer than China during the eighteenth century, does not by itself imply that its economy was like China's. Perhaps the Chinese economy had already exhausted its entire potential to become as wealthy as it was in the eighteenth century, while Britain's economy still had plenty room to maneuver. This line of reasoning has become highly popular among "Eurocentrists." No serious scholar can any longer deny that, compared to, for example, Song China, early modern Europe had quite some catching up to do. So the dominance of the West has increasingly been explained by reference to structural differences between "the West" and "the rest," that more or less pre-ordained the West to become *in due time* the top region in the world economy. Asia may have been ahead for some time, but Europe simply was more dynamic and progressive, and therefore bound to win the race. The majority of authors who have recently written about the subject still adhere to some version of this view.[16]

Classical Explanations for a Non-Existing Gap

Pomeranz briefly presents the main differences between the West and Asia that always pop up in the literature where this view is defended. He concludes that he cannot find any substantial or systematic advantage for the West with regard to agriculture, transport, livestock capital, technology, the development of a market economy, accumulation, or ecology. He sees no signs that before the eighteenth century Europe in these aspects had a significant *and* systematic advantage over Asia. Even as late as the eighteenth century, the core regions of China (and

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[15] *See* Kenneth Pomeranz, "From 'early modern' to 'modern' and back again: levels, trends, and economic transformation in 18th–19th century Eurasia." Paper presented at the All-UC Economic History Group Conference on the origins of the modern world: comparative perspectives from the edge of the millennium. University of California, Davis, October 15–17, 1999.

[16] *See,* for example, Ernest Gellner, *Plough, sword and book. The structure of human history* (London, 1988); John A. Hall, *Powers & liberties: The causes and consequences of the rise of the West* (Oxford, 1985); and Michael Mann, *The sources of social power. Vol. I. A history of power from the beginning to 1760* A.D. (Cambridge, 1986). The most recent example is, of course, Landes, *Wealth and Poverty*.

India) in various aspects still were *more* advanced than northwestern Europe. Pomeranz, of course, does not mean to say that there were no fundamental differences between the economies and societies of "Europe" and "Asia." What he purports to say is that, with regard to the question at hand, these differences were far smaller than is often suggested, and do not point to an *overall* European lead. Pomeranz indeed shows brilliantly that no historian may ever claim again that Europe alone was on the doorway of economic growth, while the East was the realm of stasis and decline. The findings of the California school of Chinese history have never been presented more succinctly and cogently. Again, I think the main thrust of his argument is right, although in this case I tend to be somewhat more reticent when it comes to some of his claims.

Let us begin with the comparison between agriculture in northwestern Europe and in China. Pomeranz repeatedly suggests that "Europe's" agriculture was more backward than agriculture in "Asia."[17] He makes much of his claim that it failed to use land intensively and that its yields per acre were comparatively low. In growing rice, the core of the Asian system, Asia's agriculture was much more land- and labor-intensive while its systems of irrigation were without parallel. It produced yields per acre that overall were far higher than in Europe.[18] On the other hand, overall, Europe's grain agriculture was more animal-intensive, and, probably, also somewhat more capital-intensive, while it was less labor-intensive.[19] To reach some kind of meaningful conclusion we would have to agree on what, in the discussion that is being waged here, really matters. To me the answer would be how much wealth the systems generate. Then what counts is, primarily, the labor productivity and, to a lesser extent, the total factor productivity of the systems compared. People produce to consume, and the higher their labor productivity, the more there is to consume per capita. In that light it is not very illuminating to say Europe's agriculture was somehow backward.[20] When it comes to this absolutely fundamental sector of every pre-industrial economy, I would have liked to see more comparisons of

[17] Pomeranz, *Great Divergence,* pp. 32, 45, 46, 55.

[18] For yields per acre *see,* for example, Mark Elvin, "The unavoidable environment: reflections on premodern economic growth in China." Paper presented at the All-UC Economic History Group Conference on the origins of the modern world: comparative perspectives from the edge of the millennium. University of California, Davis, October 15–17, 1999.

[19] Although final judgment on that last matter depends on how one looks at irrigation.

[20] From Pomeranz's perspective we would be forced to say that American agriculture in the nineteenth and twentieth centuries has always been "backward." See the fundamental distinction Bairoch makes between *productivité* (productivity) and *rendement* (yield) in

production per capita.[21] In England already in the beginning of the eighteenth century some 45 percent of labor was employed outside agriculture. For China as a whole this definitely was lower. Regionally, of course, huge differences will have existed.[22] Why call this "a failure" of Britain's agriculture? Whether it never needed to take the labor-intensive road, or never wanted to, Europe's agriculture continued to be far less labor-intensive than Asia's, minus Japan—*and* Europe got away with it.[23]

Especially when it comes to the situation in Britain, I think Pomeranz heavily underestimates the relevance of the fact that already in the seventeenth century it had so many animals, especially horses and oxen, that could be used in agriculture, in transport, and in industry. In 1695, for example, for some six million Britons there were some 1.2 million horses. The power of these horses would be equal, depending on the ratio one uses, to that of six to twelve million adult men. This, of course, is a very rough estimate, fraught with uncertainties and ignoring, for example, that many horses were just used for pleasure. But still, such an extra stock of power must have given Britain an advantage over China that simply had nothing that could function as its substitute. Britain's per capita energy fund—provided by animals, wind, water, and coal—must, already in the early modern period, have been substantially higher than China's.[24]

P. Bairoch, *Victoires et déboires. Histoire économique et sociale du monde du XVIe siècle à nos jours,* 3 vols. (Paris, 1997) II, pp. 277–80, and P. Bairoch, "Les trois révolutions agricoles du monde développé: rendements et productivité de 1800 à 1985," *Annales ESC* 44 (1989): 317–63.

[21] Rather casual remarks, like the one referring to a specific region in India with very high labor productivity cannot suffice. *See* Pomeranz, *Great Divergence,* p. 45. Compare his remarks in the EH.RES., EH.R:FORUM: Re-thinking 18th-century China, 22 December 1997.

[22] Mark Overton, *Agricultural revolution in England: The transformation of the agrarian economy 1500–1850* (Cambridge, 1996), p. 53. For data on various countries in Europe, including England, *see also* Robert C. Allen, "Economic structure and agricultural productivity in Europe, 1300–1800," *European Review of Economic History* 3 (2000) 1–25 (13); Albert Feuerwerker, "The state and the economy in late imperial China," *Theory and Society* 13 (1984): 297–326; and Kent Deng, "A critical survey of recent research in Chinese economic history," *Economic History Review* LIII, 1 (2000): 1–28 (2–6).

[23] I think in this context Pomeranz might well have paid more attention to the ideas of Francesca Bray with regard to potentialities and pitfalls of the agricultural systems of Asia and Europe. *See* Francesca Bray, *The rice economies: technology and development in Asian societies* (Oxford and Berkeley, 1994).

[24] For data on Britain's, and France's, livestock, *see* E. A. Wrigley, *Continuity, Chance, and Change: The Character of the Industrial Revolution in England* (Cambridge, 1988, pp. 34–44. For a comparison between man's power and horsepower *see* ibid. and Vaclac Smil, *Energy in World History* (Boulder, San Francisco and Oxford: Westview Press, 1994) pp. 8–11, 40–49.

When it comes to transportation, like Pomeranz I do not see any reason why China would be at a disadvantage as compared to northwestern Europe during most of the pre-industrial period, in any case not when it comes to internal transport and coastal shipping. China's internal transport with its densely knit system of waterways probably was the most efficient in the world. Things, however, were definitely not improving at the end of the eighteenth century with Chinese expansion into, for example, the Western Territories, at a time they were improving in the West, especially in England.

Then there is technology. Did Western Europe really have a technological advantage over Asia in the early modern period, as is so often claimed? Let us confine ourselves to productive technology in manufacturing. Agriculture has already been discussed, and technological or scientific feats that have no relevance for economic performance have no relevance for our story. Simply judging by its trade balance with Asia, Europe's competitive strength does not seem to have been much enhanced by this supposed advantage. During the entire early modern period its exports to Asia always predominantly, for more than three-quarters, consisted of bullion, the bulk of it silver, while the bulk of its imports consisted of manufactured Asian goods, like materials and porcelain. This is often taken as a clear sign that Europe's industry, and thus its technological performance, was weak, especially in comparison to China and India. Pomeranz seems to agree. He is not very consistent in holding that view, however, because he also subscribes to the thesis of Flynn and Giráldez that the silver that the Europeans exported should not be regarded as money but as just some economic good, one that many Asians, especially the Chinese, wanted desperately and that the Europeans were glad to sell, as it earned them huge arbitrage profits.[25] Why would Europeans try and export other products, when selling silver earned them a lot of easy money, and when Asian buyers wanted silver more than anything else? From this perspective the structure of the Asian-European trade balance does not tell us much about European or Asian technology, except that it was *the Europeans* who were willing and able to sail to China.

Europe unmistakably had a technological advantage in some sectors already before industrialization, for example, in mining, clock making,

[25] Pomeranz, *Great Divergence*, pp. 43, 159–60, 259. For the thesis of Flynn and Giráldez, *see* their "Cycles of silver: global economic unity through the mid-18th century." Paper presented at the All-UC Economic History Group Conference on the origins of the modern world: comparative perspectives from the edge of the millennium. University of California, Davis, October 15–17, 1999.

and the making of guns, but so had, overall, the East in, for example, irrigation, land management, and heating. That Europe had an advantage in some sectors of production that during industrialization proved to be of immense importance needs no comment. But the technological breakthroughs that led to its economic breakthrough, according to Pomeranz, appeared on the stage late and were not the materialization of a clear, overall, and structural Western lead. Personally, I think he tends to underestimate the differences in *dynamism* that existed between technological culture and practices in the West and the East in the seventeenth and eighteenth centuries. Brad de Long rightly claims that the locus of technological invention somewhere after the year 1000 had shifted from China to Western Europe.[26] In Pomeranz's work the wave of technological gadgets that we see in eighteenth-century Europe appears too much like a (literal!) *deus ex machina*. But still, the differences in technological efficiency between the West and China during most of the early modern period were rather small.

Let us now turn to one of the most cherished elements in Western ideology: the idea that the West was the homeground of the free market economy and of capitalism. The thesis that Western economies were much closer to the ideal market economy and knew far more *laissez-faire* than the economies of the East, is stock-in-trade in most "rise of the West" stories and has recently again been marshaled by Landes.[27] Pomeranz is adamant: this simply is not true. Western Europe was *less* of a market economy than China. The perfect markets of textbook economics did not exist anywhere in the early modern world. But Europe was even further away from this "ideal" than Asia. When it comes to markets for goods and for labor Pomeranz tends to think they functioned comparatively well in both regions. Europe's money market probably indeed functioned better than its Chinese counterpart. But, all in all, he concludes that if we define capitalism in Smithian terms,[28] it was more present in China than in Europe, while coercion

[26] *See* J. Bradford de Long, "China's advocate: a review of Ken Pomeranz's *The Great Divergence* (Princeton, 2000)" (http://econ161.berkeley.edu). This is, of course, also the thesis of Landes in his *Wealth and Poverty*, Chs. 3 and 4. I agree in principle. From a certain moment onward more new inventions appeared in Europe than in China. I disagree with Bradford de Long's and Landes's timing. Whereas they seem to place the beginning of Europe's lead in innovation in the eleventh century, I would want to place it much—at least five hundred years—later.

[27] *See,* for example, his thesis that what gave Western Europe its supposedly unique dynamism from the High Middle Ages onward was "the market." Landes, *Wealth and Poverty,* p. 59.

[28] That is as a market system where many buyers and sellers operate, all of them free to choose and none of them able to structurally influence prices, as these are determined by market forces.

and collusion in the sense of interference in, and distortion of, the market mechanism were much more widespread in Europe than they were in China.[29]

To my taste Pomeranz's interpretation of the capitalist nature of the Chinese economy is a little too "optimistic." There were some relevant differences between Europe's and China's political economy.[30] But in bringing home an important message some exaggeration is pardonable. There is no harm in emphasizing that differences between the organization and functioning of the Chinese and the Western European economies were far smaller than many historians like, for example, Landes still claim.

The concept "capitalism" has not only, and not always, been interpreted in Smithian terms. There is also the interpretation of Fernand Braudel, in which it appears as exactly the opposite of what Smith was thinking of, that is, an "anti-market," characterized by all conceivable ways of manipulating the market and interfering with the market mechanism.[31] At the heart of it we find long-distance overseas trade. This trade was anything but free. To a very large extent it was dominated by chartered companies. Mercantilism set the tone, with all that entails not only for international economic relations, but also for the domestic situation. In the *Braudellian* sense of the word, Europe indeed was, as Pomeranz admits and even emphasizes, more capitalist than Asia. This kind of capitalism indeed may have been distinctly European. Pomeranz sees it as a fundamental element in the comparative advantage Europe built up in its organization of long-distance trade, war, and colonization. Its *direct* contribution to industrialization in terms of money and people he deems rather small. Its contribution was fundamental, however, in that it enabled the West to get a privileged entry into the economies of its peripheries.

The state and the "states-system," according to many scholars "uniquely" Western institutions, have always figured prominently in explanations of how the West grew rich. In Pomeranz's work their importance, apart from their role in international economic relations, is rather played down. A little too much, to my taste. I think, for exam-

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[29] Pomeranz, *Great Divergence,* pp. 17, 18, 24, 70, 80.

[30] See the remarks of Huang and Mote on the sprouts of capitalism in early modern China: Ray Huang, *Broadening the horizons of Chinese history* (New York, 1999), passim, especially Ch. 1, and F. W. Mote, *Imperial China 900–1800* (Harvard, 1999), pp. 769, 1032. *See also* H. Gates, *China's Motor: A Thousand Years of Petty Capitalism* (Ithaca, 1996); S. Mazumdar, *Sugar and Society in China: Peasants, Technology and the World Market* (Cambridge, 1998); and Wong, *China Transformed*.

[31] For a short introduction, see Braudel, *Civilisation matérielle, économie et capitalisme,* I, Introduction and Preface.

ple, that the role of the state in China overall was not positive when it comes to the actual stimulating and facilitating of economic growth. From that perspective, its paternalistic approach and its tendency to intervene when the existing social order was threatened may have proved more of a nuisance, at least for economic innovators, than was the case with, for example, British government after 1688. One need not subscribe to the thesis that there would have existed some kind of "oriental despotism" in Qing China—or rather one *must* not do that—to be allowed to point at the fact that China under the Qing was a society with a political climate that was less conducive to innovation than Britain after 1688.[32]

Another factor that often appears in accounts of Western industrialization is accumulation. Pomeranz makes short shrift with the argument that this was something that differentiated Europe from Asia. Both in Europe and in China the money to pay for the necessary industrial investments, in principle, was available. Capital requirements of industry during its early days were relatively small. In Asia as well as Western Europe there were enough people with sufficient means to shoulder them, if they wanted to. If China did not industrialize, that was not because of lack of capital. That Europe on the other hand did, was not an "effect" of the availability of uniquely huge amounts of capital there. There is no direct linkage in Europe between the money earned in international mercantile capitalism and the coming of modern industrial production. Neither does Pomeranz think that incomes in Asia were so skewed that, as Frank claims, industry lacked a mass-market there.[33] Incomes were just as skewed in China as they were in Britain, although systematic information on this topic for China is not available before the nineteenth century.

In his entire book Pomeranz is very sensitive to ecological matters, but he strongly opposes the view that ecology was something that made the East *inherently* more unfit for growth than the West. As indicated, he does not dwell on the role of climate and illnesses, as does Landes. Nor does he agree with Frank who claims that Asian population/land-resource ratios were higher than they were in Europe in the eighteenth century and, on top of that, increasing faster.[34] He regards this as "an

[32] Just reading recent textbooks on Qing China like the ones by Mote and Hsü suffices to realize that Qing emperors could be a big nuisance and very opposed to any kind of innovative or alternative thinking. *See* Immanuel C. Y. Hsü, *The rise of modern China* (6th edition; Oxford University Press, 2000) and Mote, *Imperial China*.

[33] Frank, *ReOrient*, pp. 297–320.

[34] Ibid., pp. 308–9.

oversimplified contrast between an ecologically played-out China, Japan, and/or India, and a Europe with plenty of room to grow."[35] For the nineteenth century and the early decades of the twentieth century nobody, including Pomeranz, will deny that large parts of China went through severe ecological trouble. Pomeranz, however, claims to demonstrate that *before* that the Chinese and Japanese core areas were no worse off ecologically than Western Europe. Core areas throughout the eighteenth-century Old World faced comparable shortages of land-intensive products that were only partly resolved by trade.[36]

The ecological crisis that is supposed to have hampered Asia's economic growth is normally directly related to demographic developments. China would have run into trouble because its population increased so much and so uninterruptedly. While Europe avoided disaster, in China Malthus' fears were realized. So a standard interpretation of Chinese demographic history of the eighteenth and nineteenth centuries reads. Pomeranz rejects it. Developments in China in the early modern period were not more Malthusian than in Europe. Population growth was not structurally and significantly higher than in, for example, England, and the same goes for pressure on resources. Problems of overpopulation indeed arose in some regions of China, but only in the nineteenth century, and sometimes even later. The biggest negative impact of population growth was not so much the hitting of some Malthusian ceiling, but the simple fact that population grew much faster in the poorer regions outside China's core, thereby diminishing per capita GNP.

I will make only two comments on Pomeranz's text on ecology and demography in China: one on the situation before the nineteenth century, and one on the situation in the last two centuries. Firstly, especially the demographic historiography of early modern China is much less clear-cut than one might think reading Pomeranz. His interpretation is largely based on the work of Lee, and Lavely and Wong, who all suggest that China's population halfway into the seventeenth century was some 150 to 180 million.[37] Mote, who bases himself on figures by Heijdra, suggests that at that time it amounted to more than 250

[35] Pomeranz, *Great Divergence*, p. 12.

[36] Ibid. ". . . if we accept the idea that population growth and its ecological effects made China 'fall,' then we would have to say that Europe's internal processes had brought it very close to the same precipice—rather than to the verge of 'take-off'—when it was rescued by a combination of overseas resources and England's breakthrough (partly conditioned by geographic good luck) in the use of subterranean stores of energy."

[37] *See* Pomeranz's bibliography.

million.[38] Secondly, there is the question why it kept on rising, even when an increasing population *did* put a strain on resources. I will return to it in my discussion of why China failed to industrialize.

Advanced Organic Economies

According to Pomeranz there is not *one* structural difference between China's and Europe's society that can be regarded as making *the* difference, as setting Europe on a pre-ordained trajectory toward economic hegemony.[39] However, even if each of the factors discussed *by itself* does not matter very much, it may still be the case that *together,* in their specific combination, they make a fundamental difference. I tend to agree with Pomeranz that this was not the case. But something, or some things, *must* have made a difference. Whatever similarities one may detect in the early modern period, in the nineteenth century, Britain and China, and increasingly more in general, the East and the West, had become different worlds. There must be one or more reasons for that.

Pomeranz's observations boil down to the thesis that Western Europe and the most advanced societies of Asia all were what Wrigley would call "advanced organic societies" in which *possibilities* for growth were primarily Smithian, and *checks* on growth primarily Malthusian.[40] Smithian growth can be sustained for quite some time, and can reach fairly high levels, but as it is not based on technological breakthroughs or changes in an economy's energy and material base, it is very sensitive to Malthusian checks. Breaking through its constraints puts an economy on a completely different trajectory. Pomeranz emphasizes that the West was not systematically heading for such a breakthrough. The early modern period was not one of continuous growth in which industrialization was but a simple continuation.[41] Of course he is right. But I must admit that I do not know any serious economic historian who would make any such claim. Not even Snooks, who holds a very

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[38] Mote, *Imperial China,* pp. 745–46. For a different interpretation of China's ecological history, *see* Elvin, *The unavoidable environment,* and Mark Elvin and Ts'ui-jung Liu, eds., *Sediments of time. Environment and society in Chinese history* (Cambridge, 1998).

[39] When it comes to India and Japan, he concludes that the differences between these countries and Europe also have always been exaggerated.

[40] For a further explanation of the concepts used here, *see* Wrigley, *Continuity, Chance, and Change.*

[41] Pomeranz, *Great Divergence,* p. 9.

optimistic view of pre-industrial development and growth in Western Europe in the last millennium.[42] Scholars of the *Annales* school thought its history was basically an *histoire immobile*. Recently various scholars have claimed that overall there was no, or hardly any, economic growth in Western Europe in the early modern period, even going as far as to claim that real wages per capita of ordinary wage-laborers *declined* significantly instead of rising over the entire period.[43] Interestingly enough Britain seems to be the most significant exception to the rule. Its growth was fairly steady while, and this applies to all of Western Europe, economic development was sustained. But even in the first industrial nation the relation between pre-industrial Smithian growth and industrial growth was casual rather than causal.[44]

The transition from the "Smithian" growth to modern industrial growth was not something self-evident—let alone something inevitable. There are plenty of examples where it did not occur. People in the eighteenth century, in Europe and elsewhere, did not *expect* it to happen. In Smith's work there is no indication whatsoever that he foresaw an industrial society to emerge in Britain.What he regarded as the normal route was for economic growth to peter out and reach a stationary state. The two examples of societies he thought had reached this state were the Dutch Republic and China. Neither in the West nor in the East were developments heading inexorably toward an industrial revolution. The concept of proto-industrialization that has become popular, at least in some circles, and suggests that industrial society somehow was in the making already in the lap of the old society, in this sense really is a misnomer. A lot of proto-industry was a dead end and not "*proto*" at all. China had a lot of it, probably even more than Europe, and there, just as was often the case in Europe, it was not a steppingstone to any type of real industry. "It is not clear whether this particular non-development [that is, of China and eighteenth-century Japan, P. V.] needs much explanation. . . . The more 'natural' path appears to have been an exhaustion of the possibilities of proto-indus-

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[42] D. Graeme Snooks, "Great waves of economic change. The Industrial Revolution in historical perspective, 1000 to 2000" in Snooks, ed., *Was the Industrial Revolution necessary?* (London, 1994) pp. 43–78.

[43] *See* Pomeranz, *Great Divergence,* pp. 92, 107. Compare P. Malanima, *Economia preindustriale. Mille anni dal IX al XVIII secolo* (Milan, 1995), pp. 592–600; Jan Luiten van Zanden, "Early Modern Economic Growth: A Survey of the European Economy, 1500–1800," in M. Prak, ed., *Early Modern Capitalism* (London, 2001) pp. 69–87; and Jan Luiten van Zanden, "Wages and the standard of living in Europe, 1500–1800," *European Review of Economic History* 2 (1999): 175–97.

[44] Wrigley, *Continuity, Chance, and Change,* p. 115.

trialization. What needs explaining is why parts of Europe did not follow this path, too. . . ."[45] Therefore the question: "Why wasn't England like the Yangzi Delta?" makes just as much sense as the more "normal" one: "Why wasn't the Yangzi Delta like England?"[46]

For Pomeranz industrialization may not have caused an immediate and big increase in GNP, but it nevertheless was a fundamental break in the economic history of the entire globe.[47] As it took off in Europe it created an unprecedented divergence between the West and "the rest." It heralded a fundamentally different type of growth and an escape from ecological constraints. For evaluating Pomeranz's book it is important to define what exactly he thinks must be explained, that is, what he considers the fundamental characteristics of his great divergence. Some further comments on this matter are in order.

To the cognoscenti it will be clear that he is heavily influenced by Wrigley's interpretation of the British Industrial Revolution. In this interpretation emphasis is put on the novelty of the growth that appeared on the historical stage in eighteenth-century Britain. It implies a transition from an (advanced) organic economy to a mineral-based energy economy. This transition proceeds in a process of unbalanced growth with a few leading sectors, especially those sectors where the new source of energy and the new materials are widely used. On top of this "Wrigley-an" interpretation, Pomeranz has what Jones calls a "little-England view" of the Industrial Revolution.[48] Industrialization first and foremost was something British. It only became "European" in the sense that it spread, fairly slowly and with an important time lag, from Britain to parts of Europe.[49] As indicated, however, he is not consistent in this, and in numerous places claims, suggests, or implies that industrialization was a Western European phenomenon. For the sake of consistency I will first analyze the extent to which Pomeranz manages to describe and explain *his* industrial revolution: a sudden, unbalanced form of economic growth concentrated in some leading sectors, and primarily borne by changes in energy source and material resources that took place in Britain. Having done that, I will make some comments from the perspective of existing alternatives that see industrialization more in terms of a process of balanced, sustained, and overall

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[45] Pomeranz, *Great Divergence,* p. 292, note 92.

[46] Ibid., p. 13.

[47] Ibid., p. 8.

[48] E. L. Jones, *The European miracle: Environments, economies and geopolitics in the history of Europe and Asia* (2nd edition; Cambridge, 1987). Introduction, pp. XVI–XIX.

[49] See note 4 above.

economic growth that characterized not just Britain, but large parts of Western Europe.

Considering Pomeranz's specific interpretation of industrialization, the question of what exactly the momentous break of the great divergence involved is not difficult to answer, at least not in principle. The great divergence in the end, by definition, must boil down to the fact that during its industrialization Britain escaped from the Malthusian constraints and Smithian limits that characterized (advanced) organic economies, while nothing of the kind happened in China. But how did it take place, and why did it first take place in Britain?

Pomeranz's Explanations of the Great Divergence

What are the relevant differences that can explain the diverging of the economies of China and Britain? Pomeranz seems to prefer not to write about "causes" and "explanations," and refers to "indices" that differentiated Western Europe's core regions from those in Asia. He refers to three differences that, although not crucial, are very important:[50] a wave of technological innovations; what he calls "the advantages of backwardness," that is, the fact that some of Europe's domestic resources had still been left unexploited because of institutional blockages;[51] and, finally, certain organizational advantages in warfare, long-distance overseas trade, and colonization.[52] He also refers to the fact that there are indications that in Europe there was a wider demand for luxury goods. With the coming to power in China of the Qing, upward social mobility became more problematic, which caused a relative decline in demand for status goods in China as compared to Europe, where mass demand for somewhat distinguishing goods at the same moment in time was increasing. The effect of this development on industrialization can, however, not have been very big.

Two factors are really the core of the argument. What made Europe diverge were coal and Europe's expansion in the America's, or to put

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[50] Pomeranz, *Great Divergence*, p. 283.

[51] These were only relieved in the nineteenth century and then kept the import needs of some industrializing areas from being even larger. *See* Pomeranz, *Great Divergence*, p. 295.

[52] Pomeranz, *Great Divergence*, pp. 113, 152, 154–57, 166. Significantly enough these are all factors that helped Britain—and Europe—to acquire and exploit its peripheries (which implies that they may be regarded as underlying explanations of one the two *major* causes he presents in his book).

it in an even smaller nutshell: coal and cotton.[53] Let us begin by analyzing the role of coal. Without any doubt this fossil fuel provided Britain with an exit from an energy-supply bottleneck that sooner rather than later would have stopped, or in any case hampered, its economic growth. In the context of eighteenth- and nineteenth-century Britain it was coal that created an entirely novel energy situation. Pomeranz does not express its importance by referring to its costs/prices, but by measuring the social saving that arose from the possibility of using coal as a source of heat and energy instead of existing alternatives. That social saving that can be measured in terms of its "ghost acreage," the amount of land—for growing timber—that would have been needed to supply the amount of heat and energy coal supplied. He estimates the total amount of arable land in Britain in 1800 at around 17 million acres.[54] Already in 1815 coal provided Britain with a ghost acreage that was as large or even larger than that, to wit 15 to 21 million acres.[55] The importance of coal not only resides in its capacity to generate heat as fuel and cokes, but also in its capacity to provide steam power. Try and imagine the steep rise in manufacturing productivity, or for that matter in productivity in transportation, without coal. The importance of coal may also be expressed in the immense amount of "ghost labor" it supplied.[56] Besides, its importance is not only strictly quantitative. It had characteristics that all alternatives known and conceivable in the eighteenth century lacked. In the long run the revolution that heralded a new age undeniably was a coal revolution. It is very hard to see what could have replaced it when it came to making British industrial growth self-sustaining. Here the reasoning that Thomas and McCloskey regard as characteristic for economics, that all things are substitutes, simply does not work.[57]

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[53] *See,* for three examples, the flap text: "Together coal and the new world allowed Europe to grow along resource-intensive, labor saving lines"; p. 7: " . . . the British story is unimaginable . . . without two crucial discontinuities—one created by coal and one by the colonies"; and page 23: ". . . Europe's [!] overseas extraction deserves to be compared with England's turn to coal as crucial factors leading out of a world of Malthusian constraint." See further pages 17 and 206.

[54] Pomeranz, *Great Divergence,* p. 275. Overton, *Agricultural revolution,* p. 76, estimates that it was only some 11.5 million acres.

[55] Pomeranz, *Great Divergence,* p. 276. Compare Wrigley, *Continuity, Chance, and Change,* pp. 54–55.

[56] *See,* for example, Wrigley, *Continuity, Chance, and Change,* p. 76.

[57] *See* R. P. Thomas and D. N. McCloskey, "Overseas trade and empire, 1700–1860" in R. Floud and D. McCloskey, eds., *An Economic History of Britain Since 1700. Vol. I, 1700–1860* (Cambridge, 1981), pp. 87–102 (100). This means I also cannot attach much value to von Tunzelmann's finding that the social savings of all steam engines in Britain in

This does not mean that pre-industrial "Smithian" growth in Britain had already hit its ceiling. In the first decades of the nineteenth century, the traditional sources of energy and the technologies based on them had not yet been exhausted; water, wind, animal and manpower were still widely and even increasingly used. The economic growth of the first industrial revolution, even in Britain, was not solely founded on coal. This applies even more to other countries like the United States and Japan and their industrialization. But still, the thesis can easily be defended that coal was necessary to prevent the growth from eventually petering out. Without it—and in that sense I think it indeed was absolutely fundamental and thereby crucial—energy bottlenecks undoubtedly would have arisen.

If the search for cheap and alternative sources of energy had driven Britain underground, the relative scarcity of food and other organic resources drove it overseas. This relative scarcity was a result of the relative scarcity of land. In case one decides, for whatever reason, not to work the available land more intensively and thereby increase its productivity substantially, one can let other people grow the land-intensive products one needs, and then import them. That is exactly what Britain did during its industrialization, if we are to believe Pomeranz. It is here that the role of the periphery becomes crucial, "probably roughly as important to . . . (its) . . . economic transformation as its epochal turn to fossil fuels."[58]

Pointing at the role of the periphery in itself is not exactly a historiographical novelty. There are plenty of studies in which colonies and/or peripheries have been very prominent in explaining the British Industrial Revolution, especially studies that use Wallerstein's world-systems approach. Pomeranz is closely in line with this approach in that he emphasizes the importance for Europe of its periphery, especially its New World periphery. However, to him trade with just any less-advanced partner is not enough. What Britain needed was, first and foremost, a partner who could cheaply provide lots of land-intensive goods, and secondly, and less importantly, was willing and able to buy its finished products.[59]

Various regions are discussed, beginning with Eastern Europe, including the Baltic region, Sweden and Russia. This peripheral region was important primarily as exporter of grain and timber, and other

1800 amounted to some 0.2 percent of GNP. *See* G. N. von Tunzelmann, *Steam power and British Industrialization to 1860* (Oxford, 1978), Ch. 6.

[58] Pomeranz, *Great Divergence*, p. 23.

[59] Ibid., pp. 262–63.

materials used in shipbuilding, and of cattle. Sweden was a major producer of iron. "Eastern Europe" could not, according to Pomeranz, become as important to the Western European core as the New World periphery was to become. It fell far short of meeting Western needs and was "increasingly inadequate to western Europe's appetite for land-intensive goods."[60] This I cannot easily square with the fact that, as Pomeranz claims himself, already in the seventeenth century this East-West trade leveled off. Neither did it buy enough products from that same core. Therefore we see a permanent drain of silver from West to East. Although nobody can deny the importance of imports from the eastern European periphery for the development of Western Europe, their role was not substantial—apart from iron imports in the beginning of the Industrial Revolution—in the history of Britain. It never imported any cattle from there. Until 1770 it did not import any grain at all. And even after that date food imports from Eastern Europe were relatively minor compared to imports from elsewhere.[61]

Pomeranz continues his analysis with a description of Europe's connections with Southeast Asia, India, before it became incorporated in the British Empire, Africa, and China. He concisely and convincingly discusses their importance, emphasizing China's role as a big silver sink that kept mining silver in the Americas profitable. To him the real periphery, however, is the New World. It was trade with this region that provided the West with a unique trading partner.[62] The New World periphery was the one that really made the difference. It exported silver and gold, and was an important region in the slave trade. Pomeranz analyzes the magnitude and importance of these goods and this trade for the core regions in an even-handed way. He explains the importance of bullion and of the slave trade. American bullion, especially silver, fueled Europe's trade with the Baltic, the Ottoman Empire, India, and China. The slave trade had many spin-offs. But what *really* counted were the exports from this region of timber, so-called drug foods, and especially cotton—all land-intensive goods and mostly produced by a labor force that was not free. The New World had an additional importance as an ever-growing and "easy" market for Western European goods. Its economy was not oriented toward

[60] Ibid., p. 257.

[61] Brinley Thomas, "Food supply in the United Kingdom during the Industrial Revolution," in Joel Mokyr, ed., *The Economics of the Industrial Revolution* (Totawa, 1985), pp. 137–50, and Brinley Thomas, "Escaping from constraints: The industrial revolution in a Malthusian context," *Journal of Interdisciplinary History* 15 (1985): 729–53.

[62] Pomeranz, *Great Divergence*, p. 263.

self-provisioning. Slave owners wanted to earn money via exports to regain their outlays, and slaves were not in a position to produce their necessities themselves. Besides, population increased steeply.

The role of the periphery for British and Western industrialization has been hotly debated for a long time and has been called "peripheral" in a very influential article by Patrick O'Brien,[63] who is only the best-known exponent of those scholars who warn that the contribution of the periphery must not be overrated. Pomeranz knows their ideas and explicitly tries to counter them. To begin with, he claims that in a pre-industrial context a small increase in *gross* investment, due to profits earned in trade with the periphery—O'Brien estimated this increase at 7 percent in his famous article—can have an immense effect on the total amount of *net* investment, because net investments in a pre-industrial society are just a tiny percentage of total investments.[64] In a second line of defense he asserts that the real value of imports from the periphery is higher than the amount of money that was actually paid for them. Most products of the periphery were acquired below market price. Transatlantic relations between the Old World and the New World were not "consensual."[65] Significantly enough, exports from the New World periphery kept on rising *in volume* while at the same time they constantly declined *in price*.[66] On top of that, this periphery, in contrast to, for example the Eastern European periphery, constantly increased its imports from the core regions. Pomeranz claims that extra-market forces were largely responsible for that too. To him the circum-Caribbean region was "a perversely [sic] large market for imports."[67]

Again, the sinew of his thesis is that the importance of products must be measured in what it would have taken to find substitutes. Pomeranz tries to calculate the ghost acreage of the most important products that Britain imported from its New World periphery. Timber

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[63] *See* Patrick K. O'Brien, "European economic development: The contribution of the periphery," *Economic History Review,* 2nd ser. 35 (1982): 1–18. For a later article in which O'Brien regards the role of the periphery as somewhat more important, *see* Patrick K. O'Brien and Stanley L. Engerman, "Exports and the growth of the British economy from the Glorious Revolution to the peace of Amiens," in B. Solow, ed., *Slavery and the rise of the Atlantic system* (Cambridge, 1991), pp. 177–209.

[64] Pomeranz, *Great Divergence,* pp. 187–88.

[65] Ibid., p. 24. Compare ibid., p. 296: It was because of "unique institutions and conjunctures (that) far more of the New World bounty went far earlier to Europe than purely Smithian trade could have guaranteed." For the importance of coercion and "non-market forces" in the intercontinental trade of the West, *see also* pages 161 and 296–97.

[66] Pomeranz, *Great Divergence,* p. 267.

[67] Ibid., pp. 267–68.

imports from this area amounted to 1 million ghost acres, as compared to the 650,000 ghost acres Baltic timber provided. The import of so-called drug foods provided some 4 percent of Britain's calorie intake around 1800.[68] To acquire the same amount of calories Britain would have needed an equivalent of at least 1.3 to 1.9 million acres of grain. For 1831 this had increased to 1.9 to 2.6 million acres. The importance of cotton is impressive, even when measured in the "traditional way," as a percentage of total import or in money.[69] But again it is the ghost acreage that shows its real importance. For 1815 he estimates cotton's ghost acreage at 9 million acres.[70] The estimate for 1830 is 23 million acres, far more than the total acreage of British cropland! The ghost acreage needed in terms of growing flax would only have been a tiny 200,000 acres (for 1815) and 500,000 acres (for 1830). The same goes for hemp. Pomeranz claims that these materials, however, could, for various reasons, not really function as substitutes for cotton.[71] The total ghost acreage Britain acquired by importing cotton, sugar, and timber in 1830 was some 25 to 30 million acres.[72]

An Analysis of Pomeranz's Explanation: Coal and Cotton

How convincing is this argumentation? The remark that small increments in gross investment can make a huge difference in net investment rates does not strike me as very valid. In principle I second what Deirdre McCloskey has said about this type of reasoning: "If something as small as what Patrick [O'Brien] calculates is to be refurbished and set up as some sort of big factor, then all kinds of previously ignored domestic things are even bigger: if small factor 87 is to be counted as big, then all other small factors are big too."[73] There is, however, theoretically at least, a possibility to uphold Pomeranz's argument, and that is by claiming that early modern Britain, or Europe, had

[68] Ibid., p. 275.

[69] *See* Eric, J. Evans, *The forging of the modern state. Early Industrial Britain 1883–1870,* 2nd ed. (London and New York, 1996) pp. 414–18.

[70] Britain would have needed this amount of land to feed the sheep that could produce the wool needed to substitute for the materials that were made from cotton.

[71] Pomeranz, *Great Divergence,* p. 315.

[72] Ibid., p. 276.

[73] See McCloskey's contribution in the EH. RES., EH.R: Forum: Frank versus Landes, 9 June 1998.

no alternative source of income—or nothing that comes sufficiently close to it—for the income it earned in its periphery. Personally I tend to think that to a large extent alternatives could and would have been found.[74]

When it comes to the non-consensual character of trade between Britain and "its" New World periphery, Pomeranz might have expanded a little more on how to fit in the fact that an extremely important part of the New World, to wit the United States, was independent and sovereign from the late 1700s, while "Latin America" only became liberated from Spanish and Portuguese tutelage after 1800. I will not deny that "Britannia ruled the waves," but how could the British force people there to pay them "their" price and deliver them "their" goods? Pomeranz seems to be aware of the problem and indicates that in the nineteenth century the role of India and China as peripheries became more prominent. That is true, but it does not really fit in "elegantly" in his argument. Neither does the fact that in the 1820s Europe still was by far the biggest importer of British cotton, buying more than 58 percent of the piece-goods and more than 65 percent of the cotton manufactures Britain exported.[75]

All this talking about coercion, collusion, and non-Smithian trade suggests that Britain had a periphery that provided cheaper and easier supplies than peripheries of other regions in the world. The reader, however, looks in vain for a comparison between the prices the British paid in their periphery, prices paid elsewhere in the world and, if they existed, "world market prices." It is clearly implied in his argument that Britain could procure its cotton from the United States for a lower price than, for example, the Chinese could from their periphery, or from someplace else. But nowhere in his book does Pomeranz put this card clearly on the table, nor is any effort made to prove that this indeed was the case. The results of this kind of systematic comparison might have been interesting. Sugar, for example, was often sold in Britain at prices *higher* than world market prices![76]

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[74] Interestingly enough, O'Brien and Engerman in their article think there indeed were not many alternatives. See note 63.

[75] Pomeranz, *Great Divergence*, pp. 284–85. For a fine overview of British exports of cotton manufactures and piece-goods and of British imports of raw cotton, *see* D. A. Farnie, *The English cotton industry and the world market, 1815–1896* (Oxford, 1979), Chs. 3, 4, 5. The book is in Pomeranz's bibliography.

[76] Thomas and McCloskey, "Overseas trade and empire," p. 98. Between 1768 and 1782 all imports from the British West Indies—except ginger—were sold in Britain for prices that were above the world market price because of preferential treatment for West Indian landlords.

An underlying suggestion in Pomeranz's comments on the situation in the periphery is that the labor of slaves was cheaper, which made their produce cheaper, and that therefore the British were somehow in a privileged position by having the possibility to buy in a slave periphery of their own. This sounds plausible, but is it true? Should one really expect slaves to produce cheaper than domestic workers, who could be, and normally were, paid wages far below subsistence costs? There were millions of domestic laborers in India at the end of the eighteenth century when this region was becoming a periphery of Britain. There were also millions of them in China. In both countries, as Pomeranz himself indicates, wages were lower than in Europe, and I bet they were lower than the "wages" of slaves in the New World. There is no denying that Britain bought most of its cotton from the South of the United States, and that it did so because *for Britain* this region was the cheapest supplier.[77] But I wonder whether this had much to do with "non-consensual trade" and slavery. The United States was simply much closer to British ports than were the big Asian producers, and its economy was far more open. Transport inside the United States became relatively cheaper and less problematic than in large parts of Asia because of the extension of railway lines and canals. The plantation system had all kinds of economies of scale, not because it worked with slaves, but simply because plantations were bigger enterprises than most Asian cotton farms. In Asia, in all probability, cotton production would have been cheaper than in the United States.

Pomeranz could, of course, claim that the advantage of the New World for Britain was not so much that supplies from there were cheap, but that they *continued* to be cheap and even became cheaper, notwithstanding increasing demand. In contrast, it is implied, to what would happen if demand for land-intensive resources were to rise substantially in, for example, China. Here Pomeranz's comparative approach is faltering. He does not provide systematic information about prices and supply and demand conditions in other core regions and peripheries. In this way some important questions remain open. To begin with, the question whether Britain—and, of course, other core regions—may have been in a position to buy its "land-intensive" raw materials someplace else. Apart from a few comments on pages 277 and 278 on problems the British faced in importing cotton in the period of the American Civil War, this subject is not touched upon. I

[77] *See* Farnie, *English cotton industry,* Ch. 4.

just put "land-intensive" in quotes as the most important of the goods Pomeranz refers to, to wit cotton, which happens to be not very land-intensive! If Britain would have been deprived of its cotton imports it would indeed have needed an immense amount of land to keep sheep for wool, but in cotton-growing regions cotton is not a land-intensive product. Even during periods of boom it did not put much pressure on land in the United States.[78] This suggests that Britain might, *in principle,* have found alternative suppliers fairly easily.[79] *In fact,* however, it continued to rely heavily on imports of cotton from the Cotton Kingdom in the southern United States.[80]

Much depends on how big British demand for cotton was as compared to total supply in the world. If it were substantial, one might expect prices to rise as soon as Britain transferred its demand from the United States to somewhere else. It was not. To give but two examples: "Between 1785 and 1833, the single province of Kwantung imported on average from India each year six times as much raw cotton as all of Britain used annually at the time of Arkwright's first water frame. Again, an expansion of Chinese exports of cotton cloth comparable to eighteenth-century Britain's both in its speed and in its relative size to the domestic market would have been too great for the available purchasing power of the world at that time."[81] Pomeranz himself indicates that in the eighteenth century Jiangnang Province in China had a cotton production of some 500,000,000 pounds, as compared to Britain's import in 1815 of 100,000,000 pounds, and in 1830 of 263,000,000 pounds. In 1870 China as a whole produced 1,850,000,000 pounds, which he thinks is at least as much as it was in 1750, when the population was much smaller. Overall cotton consumption per capita in China in the mid- to late eighteenth century is considered to stack up quite well against Europe's.[82] Mehmet Genç provides the following information with regard to the cotton industry in the Ottoman Empire: "In 1772 England consumed 4.2 million pounds of raw cotton. In 1792 this had risen to 15.5 pounds. In 1790

[78] *See* Robert William Fogel, *Without consent or contract. The rise and fall of American slavery* (New York and London, 1989), p. 171.

[79] Compare the comments of Goldstone in EH. RES., EH.R:FORUM: Re-thinking 18th-century China, 19 December 1997. See, however, Pomeranz's remarks on pages 277 and 278 and his reaction in EH.RES., EH.R:FORUM: Re-thinking 18th-century China, 22 December.

[80] *See* Farnie, *English cotton industry,* Ch. 4.

[81] Mark Elvin, *The pattern of the Chinese past* (Stanford, 1973) pp. 312–13.

[82] Pomeranz, *Great Divergence,* pp. 315, 330–38.

the Salonica-Macedonia region alone spun 7 million pounds of cotton into yarn and used half of it in weaving."[83]

More fundamentally, I would like to know how much the prices of its raw material mattered considering how much more efficient British cotton production was. Would it not still have conquered the market, even if it would have been necessitated to buy someplace else and more expensively? Was not its real competitive edge in producing cheap finished goods, instead of in buying cheaper raw materials?[84]

When it comes to the supposedly "perversely large" export markets of the New World, I wonder how large "perversely large" is. Again, the United States was a sovereign country. If people there bought cotton cloth and other things from Britain, it was because they wanted to and had their reasons. The West Indies in any case could never have been a perversely *large* market. Their population simply was not big enough. In 1801 the British Caribbean was inhabited by 760,000 people. Pomeranz suggests that the market for British goods in slave regions could become larger than "normal" because, among other things, slaves were in no position to produce their own food and clothing. They lacked the time and the freedom to do so. This is an exaggeration. Not all slaves there were working as laborers on cotton plantations, and even those on plantations were not producing cotton most of the time. Contrary to Pomeranz's assertion we know that slaves in the southern United States were producing quite some grain, vegetables, meat, potatoes, and clothes.[85] So chances are that markets here were not *perversely* large either.[86]

That brings us to the ghost acreage. Timber imports were not neg-

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[83] Mehmet Genç, "Ottoman industry in the eighteenth century: general framework, characteristics, and main trends," in Donald Quataert, ed., *Manufacturing in the Ottoman Empire and Turkey, 1500–1950* (New York 1994), pp. 59–86 (82–83).

[84] Farnie claims that, in England, the costs of raw cotton formed the largest single element in the production of cotton textiles and that the decline in cotton prices made a far larger contribution throughout the nineteenth century to the reduction in the price of manufactures than either cost-cutting technological innovations or improvements in labor productivity. Farnie, *English cotton industry,* p. 83. I do not agree. *See* David Eltis and Stanley L. Engerman, "The importance of slavery and the slave trade to industrializing Britain," *The Journal of Economic History* 60 (2000):138, note 42. The price of cotton yarn fell much more than the price of raw cotton. But anyhow, what really matters, is what this implies with regard to Britain's competitive advantages.

[85] Fogel, *Without consent or contract,* pp. 44–45. Compare, for the British Caribbean, Stanley L. Engerman, "The Atlantic economy of the eighteenth century," *The Journal of European Economic History* 24 (1995): 145–76 (150).

[86] *See* Farnie, *English cotton industry,* p. 91, where it is indicated that the Americas in their entirety never imported more than some 30–35 percent of the piece goods and cotton manufactures exports of Britain between 1820 and 1896.

ligible, but their importance dwindles as compared to that of (drug) foods, and especially cotton. Even the imported drug foods could have been done without. The importance of New World peripheries in this field is not stunning. Sugar amounted to 4 percent of the calorie intake in Britain around 1800.[87] These calories could have been missed without any economically significant consequences. The real loosening of the *food* constraints was brought about by imports, not from the New World, but from the Celtic fringe, the European continent, and, in the second half of the nineteenth century, increasingly from North America and Russia.

Pomeranz tends to give the impression that Britain really went through the eye of the needle, and that without food imports things would have gone very wrong.[88] He thinks it had not much so-called "advantages of backwardness" left.[89] Britain's increasing dependence on the outside world for food is an unmistakable fact, but it has to be seen in perspective. Its predicament was not as bad as Pomeranz suggests when for example he claims that ". . . English agricultural productivity seems not to have changed much between 1750 and 1850,"[90] or comments that ". . . per-acre and total yields from arable land remained flat and the threat of decline constant."[91] Britain's population between 1750 and 1850 increased from some 6 million to some 18 million. Its trade balance for food and drinks in this period changed from a small "agricultural" export surplus up to the 1770s, to an import surplus of some 25 percent, which implies that total production must have roughly doubled.[92] The old system apparently had not yet reached its limits. Production and productivity still could, and did, increase remarkably. The Netherlands, one of the most densely populated regions of Europe in the early nineteenth century, and one of the richest as well, was a food-exporting country. In Britain at the end of the eighteenth century rural agricultural wages were much lower than

[87] To increase, however, to no less than 18 to 22% in 1901. *See* Pomeranz, *Great Divergence,* pp. 274–75.

[88] *See,* for example, his remark on demographic and proto-industrial expansion that far (sic!) outpaced advances in agriculture (Pomeranz, *Great Divergence,* pp. 296–97).

[89] Ibid., pp. 216, 283.

[90] Ibid., p. 216. He refers to Gregory Clark, "Yields per acre in English agriculture, 1250–1860: evidence from labour inputs," *The Economic History Review* XLIV (1991): 445–60. I must admit I fail to see that this is the *portée* of what Clark says.

[91] Ibid. He refers to M. Ambrosoli, *The wild and the sown* (Cambridge, 1997), pp. 367, 374, 392–95, 412.

[92] *See* Overton, *Agricultural revolution,* pp. 75, 89; and Thomas, "Food supply" and "Escaping from constraints." The total acreage of (sown) arable land did increase in this period by some 50 percent. *See* Overton, *Agricultural revolution,* p. 76.

urban wages, which I regard as an indication that pressures on agriculture were less than possibilities in industry.[93] But still, it is a fact that Britain was increasingly fed by foreigners.[94] Finally, when it comes to cotton, Pomeranz definitely has a point. It is very hard to imagine what home-grown or home-made product could have taken its role in the industrialization of Britain, although it would have been useful had Pomeranz expanded more on why according to him flax and hemp could not function as "reasonable" alternatives.

Analyzing the importance of trade relations in terms of ghost acreage is a sensible and enlightening strategy. To be completely systematic, Pomeranz ought to have also tried to figure out how much ghost acreage would have been involved in the event that Britain would not have traded with Western Europe. What is unfortunate, in any case, is that the author, who certainly is not shy of presenting and constructing quantitative data, nowhere in this book presents figures about topics that are really quintessential, such as Britain's imports from, and exports to, its various peripheries; trade relations between the rest of Western Europe and Britain; trade relations between the rest of Europe and its peripheries; the relative size of international trade of various countries as a percentage of their GNPs; its geographical distribution; the percentage of international trade that was in British hands; world prices of various products; and the prices the British had to pay. Now the reader has to constantly look someplace else for information that is important to assess Pomeranz's thesis.

Do Coal and Cotton Really Explain the Great Diverging?

Pomeranz claims that without coal and without imports of land-intensive goods from the periphery, British agriculture, and certainly fiber production, would have reached their ceiling very quickly, and thereby British growth would have petered out. In that sense he thinks referring to these necessary conditions provides an adequate description of the Industrial Revolution in Britain. No doubt some reviewers will point out that even in Britain the Industrial Revolution was more than coal and cotton. Personally, I think it was indeed more of a balanced

[93] Pomeranz, *Great Divergence,* p. 89.

[94] In 1910 Britain imported 80 percent of the wheat it consumed, while between 1860 and 1910 meat imports increased nineteen-fold. *See* Thomas, "Escaping from constraints," p. 748.

growth phenomenon.[95] But let us not nit-pick. It would have been an unrecognizable "industrial revolution" without them, and I doubt whether it still could be called a "revolution."

So, at the heart of the Industrial Revolution in Britain lie coal and cotton, both of which Britain "happened" to possess, while "the rest" did not. But to what extent have we also given an adequate *explanation* of this revolution by simply referring to these two factors?[96] This question is legitimate, as for Pomeranz indicating the essence of the revolution just about equals explaining it.

Let us start with Pomeranz's thesis on the contribution of the periphery. The simplest way to make the point I want to make is by observing that Britain had to *pay* for the supplies it acquired there, and then by asking *how* it acquired the money to do that.[97] The answer is quite simple: by and large by exporting *industrial* goods. This applies to America as well as to other peripheral areas. Without its industrial exports Britain would not have been able to become a country that at the end of the nineteenth century imported the bulk of its food and other land-intensive resources. Without its Industrial Revolution Britain simply would not have been able to import the goods Pomeranz likes to refer to! Its exports, *and* thereby its imports, would then have been much smaller. Significantly, the prices of British export products —overwhelmingly manufactured goods—*declined* as compared to the prices of its imports—overwhelmingly food, raw materials, and semi-processed goods, something Pomeranz does not refer to. Part of this decline may be explained by simple economies of scale, but the bigger part of it is due to technical innovations in production and transport that we consider to be part and parcel of industrialization. Britain's terms of trade by and large deteriorated during the nineteenth century. That makes me subscribe to the view that industry was a stimulus to trade more than trade was to industry.[98] The Industrial Revolution in

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[95] *See,* for example, Peter Temin, "Two views of the British industrial revolution," *The Journal of Economic History* 57 (1997): 63–82 and C. Knick Harley, *"Reassessing the industrial revolution,"* in Joel Mokyr, *The British industrial revolution. An economic perspective* (Boulder: Westview Press, 1993), pp. 171–226.

[96] Gregory Clark, rightly, already asked this question in his contribution to EH.RES., EH.R:FORUM: Re-thinking 18th-century China, of 24 November 1997.

[97] Pomeranz suggests that it paid less than market prices, less than its (potential) competitors, and had better possibilities of increasing its imports. He does not prove it, but in any case, the New World periphery was not just a windfall.

[98] See for this point of view, for example, Thomas and McCloskey, "Overseas trade and empire" and Mokyr, *British industrial revolution,* pp. 68–78. In Britain the price of raw cotton as well as the price of cotton fabrics declined during the entire nineteenth century. *See* D. S. Landes, "The fable of the dead horse: or, the industrial revolution revisited," in Mokyr, *British industrial revolution,* pp. 132–70 (160–61).

Britain in essence was an increase in productivity, much more than a windfall of cheap resources.

I could go even further. A lot of Britain's imports would simply have been *impossible* without industrialization. Not just in the sense I just described, industrialization creating the wherewithal to pay for various land-intensive imports, but also because of the changes in production and transportation that were at the heart of industrialization (railroads, steamships, machinery, artificial fertilizer, and so on and so forth) that enabled the periphery to produce cheaply for the core at the same time enabling the core to produce more and cheaply to provide for its own and its periphery's needs. The increase in production and export of land-intensive goods in the periphery—and indeed also in the core—was more an *effect* of industrialization than a *precondition*.

Technology, Institutions, "Slack" and the Structure of Demand

Saying the British could industrialize because of coal and the Americas in itself does not indicate why and how it was Britain, and not some other country, that was to use coal so effectively and create an empire to suit its industrialization. In principle other countries might have done so too. Having coal and the Americas does not suffice, or rather, one does not "have" them. One has to find, master, and use them. Pomeranz really underestimates the problems, costs, and time involved in this. His book bristles with references to "the fortunate location of coal," "fortuitous global conjunctures," "geographic good luck," "geographic accidents," "crucial accidents of geography and juxtaposition," or "massive windfalls."[99]

Coal is just a fossil fuel lying under the ground. It had to be mined, transported, used in all kinds of production processes, transformed into cokes or steam, and so forth, before it could become the crucial economic asset it indeed became in Britain. In that process a wide range of problems had to be tackled. That was not an easy job and success was not guaranteed. Inventions and innovations, not just in the mining of coal itself, were called for. Many shortages in history have presented a challenge that was never met by an adequate response. Many necessities have mothered no inventions. Moreover, the relation between ecological constraints and inventions—in general, not

[99] Pomeranz, *Great Divergence*, flap text and pp. 12, 16, 68, 241.

only those related to coal—is far less obvious and direct than Pomeranz suggests.[100]

That brings us to an additional, very relevant, difference between Britain and China, to wit, technology, appearing as the extra that made it possible for Britain to use its coal optimally. Pomeranz agrees that technological innovations were very important, that Europe had more of them and that this fact needs explaining. He does not seem to do this wholeheartedly. He likes to play down their importance and their innovative character by suggesting they were simply an effect of having coal and being challenged by its problems[101] by suggesting that as the concept of atmospheric pressure was known in China, the steam revolution may have occurred in China as well,[102] or by claiming that their importance would have been much smaller without coal and the periphery.[103] Even if that were true, one simply cannot make a list of technological gadgets for China that can stand up against the wave of inventions we see in Britain, and wider in Europe, in the eighteenth century. China was not on some brink of a Scientific Revolution, nor, which is far more important, as the Scientific Revolution was not the very heart of the first industrialization, was it technologically as dynamic as the West. What we are facing is not a matter of Britain becoming more advanced, at last, and to a large extent by luck, and then solely in coal-related technologies. What we see evolving in the eighteenth century is a wide-ranging Western lead in technology. Its innovations fitted into a long process of continuing and self-sustaining invention and innovation in Western Europe.[104] One can of course say that the steam engine was just a simple and ineffective device that could easily have been invented elsewhere. But inventions are always

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[100] Compare M. W. Flinn, "Technical change as an escape from resource scarcity: England in the 17th and 18th centuries," in William Parker and Antoni Maczak, eds., *Natural resources in European History,* (Washington, D.C., 1978) pp. 139–59.

[101] *See,* for example, pages 67, where he calls Britain lucky to have the problems it had with coal and 211, where he claims that ". . . favorable resources shocks . . . bought time for the emergence of other innovations." He adds though that this ". . . does not mean that having this extra breathing room explains technological creativity; . . . the two factors worked hand in hand, each increasing the rewards of the other."

[102] Pomeranz, *Great Divergence,* pages 61 and 62. I disagree. *See,* for example, H. Floris Cohen, "Het ontstaan van onze moderne wereld. Wat natuurwetenschap en techniek er mee van doen hebben (The emerging of our modern world. The role of science and technology)," *Theoretische Geschiedenis* 25 (1998): 322–49.

[103] Pomeranz, *Great Divergence,* pp. 17, 32, 66, 68, 283.

[104] E. H. Tuma, *European economic history: Tenth century to the present. Theory and history of economic change* (New York, 1971), pp. 229–37. Compare Landes, *Wealth and Poverty,* Ch. 4.

simple *after the fact*. Every simple schoolboy-hacker nowadays knows more about computers than Einstein did.

Just like coal, the colonies are not just a windfall. The Americas were not just a tract of land waiting to be exploited. They had to be found, explored, and exploited. Behind "the colonies" lay a very specific British political economy. Again, Pomeranz knows this and he explicitly refers to Europe's political economy of collusion and coercion and how the Europeans could profit by it. But the enormous costs of empire in money, time, effort, and people never get any attention. It just won't do to consider the British Empire as some kind of "fortuitous windfall." That would even be too "optimistic" with regard to the Iberian countries that indeed earned some very easy profits overseas.[105]

That leaves us with two "explanatory differences." The one that is called "slack" by Pomeranz was, according to him, almost absent in Britain, so I will not go into it here. The other one, the existence of a higher pace of changes in fashion in Britain and Europe, especially in clothing, will surely have played a role in the industrious as well as the industrial revolution in Europe. Without the changes in fashion and the high demand for exotic goods, manufactured or not, innovations in European production would have been much slower. The explanation of this difference between Asia and Europe, however, is another matter I will discuss here.[106]

Why Didn't China Industrialize?

Why did China, or for that matter other Asian core regions, not use coal and acquire peripheries? In the strict sense of the word China had coal. It still has plenty of it.[107] As we know from the work of Marco Polo it already knew coal before most European countries did. Already in the Song period, it mined coal and produced coke and iron in very impressive quantities. But in Qing times its coal lay in the wrong

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[105] For just some examples of these immense cost of Empire, which according to some scholars were even bigger than imperial benefits, *see,* for example, Patrick K. O'Brien and Leonardo Prados de la Escosura, eds., *The costs and benefits of European imperialism from the conquest of Ceuta, 1415 to the treaty of Lusaka, 1974*. A special issue of *Revista de Historia Económica* 16 (1998): 1–42, Madrid, 1998. Also published in *Itinerario* 23, 3 and 4 (1999) pp. 25–52 and Thomas and McCloskey, "Overseas trade and empire."

[106] *See* Pomeranz, *Great Divergence,* pp. 124–65.

[107] *See* Benewick and Donald, *State of China,* p. 36. At the moment China is the world's leading coal producer!

places and it did not create the technologically stimulating problems that Western coal created. Moreover, its mines were exploited on a very minor scale via small entrepreneurs. I think here there is an element of historical contingency—or better geographical contingency —that really mattered. In this sense China was indeed "unfortunate," although, of course, we are not referring to insurmountable problems. Might not the Chinese have found a solution to this geographical problem?

Why did it not have its Americas? In short because it did not need, and to a large extent, also did not want to. That does not mean that after Zheng He, as is so often claimed, China turned its back on the sea and the outside world to begin its long period of "stasis and retreat."[108] China had an immense overseas trade. But it had no overseas colonies and peripheries. There were overseas Chinese, but there was no systematic state support for settler colonies. To put it under one too-blunt term: there was no Chinese mercantilism.[109] Which as Pomeranz admits, is a very significant point. Mercantilist policies provided Europe with far more experience in the organization of long distance trade, colonization, and warfare than was acquired by the Chinese. In the nineteenth century the Chinese would live to regret that.

China, by the way, had something of a periphery of its own. In the eighteenth century it became twice as big as it had been. It also had an impressive series of tributary states at its margins. But its "periphery" was a land periphery in an intra-state connection, part of an empire, not a New World type of periphery, part of a Wallersteinian world system. It was filled up by free peasants who worked for subsistence, therefore exported less food and land-intensive goods to the core than was the case in the New World periphery, and who because of their putting-out activities, still according to Pomeranz, tended not to buy very much from that core.

But, frankly, if China would have had coal and colonies, I still think it would not have industrialized before England. The technology and the technological drive were simply lacking. When it comes to its economic structure, in the eighteenth century there still were no pressing

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[108] Landes, *Wealth and Poverty,* Ch. 21.

[109] *See* Pomeranz, *Great Divergence,* pp. 166–207 and Pomeranz, EH.RES., EH.R: FORUM: Re-thinking 18th-century China, 27 November and 11 December 1997. Confer Kent Deng, *Maritime sector, institutions, and sea power of premodern China* (Westport: Greenwood Press, 1999), Ch. 5, and Roy Bin Wong, "The political economy of agrarian empires and its modern legacies," in T. Brook and G. Blue, eds., *China and historical capitalism. Genealogies of sinological knowledge* (Cambridge, 1999), pp. 210–45.

reasons to take a different path, no pressing bottlenecks that could act as incentives for structural change. Moreover, China's political economy as such was not geared to structural economic change, rather the opposite.

In a way Pomeranz is right in claiming that "nondevelopment" in China indeed does not need much explanation. Till the end of the eighteenth century, not industrializing had been the perfectly normal thing to do.[110] What does need explaining, more than Pomeranz provides, is why this highly developed and sophisticated economy did not pick up. How could differences that initially were small, become so big fairly rapidly, and increase for more than a century? Why did not China start its pursuit of Albion much earlier and on a much broader scale than it eventually did?

Many theses have been put forward to solve this riddle, most of them simple extensions of the explanations offered for the fact that China was not the first nation to industrialize. Explanations in which demography has pride of place are still among the most popular ones. They are, for example, one of the few things Landes and Frank tend to share. Population growth in China was so high and sustained that the country was hit by relative overpopulation, and Malthusian symptoms emerged. Stated in terms like these, Pomeranz does not agree with the Malthusian thesis. Pressure on resources was more or less the same in Britain and China in the eighteenth century, maybe even worse in Britain than in China. Population growth in industrializing Britain, between 1750 and 1900, was far higher than in China at that time. This could be interpreted as indicating that population growth was only becoming a problem in China *because* there was no industrialization, rather than indicating that there was no industrialization because population was increasing. That would be too rash. In Britain, as well as in Japan, population growth had leveled off significantly, to the point of almost becoming zero for quite some decades before economic take-off.[111] This probably facilitated growth per capita, investment in infrastructure, and capital accumulation. In France, where industrialization was a rather slow process, population growth from the second half of the eighteenth century was slow, too. This combination may also have facilitated some increase in wealth per capita. The longer population growth continued without industrialization,[112] the more

[110] Pomeranz, *Great Divergence,* p. 292.

[111] Alan Macfarlane, *The savage wars of peace: England, Japan and the Malthusian trap* (Oxford, 1997).

[112] And it did continue in China, even though in the nineteenth century it may have become less fast. *See* Pomeranz, *Great Divergence,* p. 239.

difficult it may have become to eventually put the Chinese economy on a completely different, industrial track. The continuous increase of population, especially in the north of China, is an intriguing phenomenon that deserves the further research Pomeranz asks for.[113]

In the Chinese context of a smoothly operating Smithian economy, the sustained population growth has often been blamed for the emergence of a so-called "high-level equilibrium trap."[114] Central in the concept, which was almost integrally taken over by Frank, is the idea that wage costs are too low, and capital and resources too scarce, to switch to machine-powered production.[115] Pomeranz rejects claims that Chinese labor costs were so low that investing in machinery made no economic sense.[116] The costs of early industrial machinery were so insignificant, and the productivity gains by using them so impressive, that wage levels can hardly have been an incentive not to start producing with machines. If we are to believe Pomeranz and his likes that China was not poor compared to Western Europe, that incomes there were spread as evenly as they were in Europe, and that its markets were highly integrated and functioned even better than in Europe, then in principle for Chinese entrepreneurs there must have been a very large market. Every reason for clever Chinese entrepreneurs to start mechanizing, I would say.

Overall that is not what happened, at least not on a scale comparable to the West. Why is this the case? Pomeranz does not go very deeply into the matter, but he does address it. His thesis reads that in the nineteenth century China's core regions, which already were highly efficient in their production techniques, lacked not only coal but, especially, a periphery of the kind the Western cores had. In China's peripheral regions agricultural and industrial production increased with population, but this "periphery" did not evolve into a flexible provider of cheap resources to the core and a flexible buyer of its goods. Instead we see a decrease in the export of food and other land-intensive products, now needed at home, and import substitution

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[113] Ibid., pp. 244–46.

[114] This expression has, of course, been made famous by Mark Elvin, who uses it in his *Pattern of the Chinese past*, Part 3. This still is the best place to look for further explanation. In the meantime Elvin has changed his mind somewhat and thinks that what caused China's economy so much trouble can better be described as an "ecological lock-in." For an explanation, *see* Elvin, *Unavoidable environment*. We have already seen that Pomeranz, who does not refer to these latest ideas of Elvin, does not believe China's predicament was fundamentally ecological.

[115] Frank, *ReOrient*, pp. 297–320.

[116] Pomeranz, *Great Divergence*, pp. 52–53.

when it comes to the production of manufactures, especially by proto-industrial production. The fact that free peasants were the main producers made the main difference with the situation in the New Word periphery. There is a strong element of path dependency here: The further a society goes down this land-intensive road, the harder it becomes to take up a capital-intensive and energy-intensive road, even with windfalls like technology and external peripheral supplies.[117] The more efficiently the available means of production are used, the harder it becomes to set up a new system of production.[118] I must admit I am not impressed by this argument. Is there any indication that Chinese entrepreneurs did not mechanize production, and that China did indeed not industrialize like Europe because of shortages of raw materials?[119]

I am not an expert on Chinese economic history in the nineteenth century and can only refer to the works of those who are.[120] The reasons they bring forward are many, but I have not found any indication that cotton or silk had become so scarce and so expensive that a would-be industrialist would have been deterred from setting up a factory. If, as Pomeranz himself claims, mechanized production in principle turned out to be cheaper than non-mechanized production, it would be very strange indeed if a stubborn entrepreneur would not have found his raw materials in an immense and productive country like nineteenth-century China.

A complete answer to the question at hand would require intensive research and a whole book, but in that research I would in any case suggest to focus more on the role of the state and of institutions than Pomeranz does in this book, and therefore would come closer to Wong's excellent analysis in *China Transformed*. China's economic institutions and infrastructure were not up to the expectations of a modern industrial economy. Maybe the lack of formal economic institutions and rules, and the existence of a weak state were not much of a disadvantage in a fairly closed, pre-industrial society. In the industrializing and

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[117] Ibid., pp. 238–39. Even nowadays, according to Pomeranz, China cannot easily start creating an export-oriented industry and import more primary products. Many of the "surplus" workers in agriculture still cannot be moved to factories without worsening the shortfall of agricultural output. Maybe the capital-intensive road taken by Western agriculture already very early on was not so "backward" and inefficient after all.

[118] Pomeranz, *Great Divergence*, p. 283.

[119] Lack of purchasing power from the masses, in my opinion, cannot have been an important factor as people who could afford handmade goods like textiles would surely have been able to afford them if they were made by machines.

[120] I only refer to Philip Richardson, *Economic change in China, c. 1800–1950* (Cambridge, 1999), which gives a good overview and analysis and has an up-to-date bibliography.

internationally competing world of the nineteenth century they definitely were. The Chinese state in the nineteenth century was a very weak state. It did not provide the "protection" and infrastructure that are necessary preconditions for industrialization. It lacked means, will, and power. Becoming at the mercy of the great Western powers, of Russia, and later on also of Japan, did not help. Neither did the catastrophic social unrest and the huge size of the empire. Too easily people forget that industrializing a tiny island like Britain is quite different from industrializing a huge continent like China.

Industrialization as a Western European Phenomenon

Until now the problem of the great divergence has been interpreted as explaining why Britain industrialized while China did not. I doubt whether this is the best way to put it. In any case, this is not what is normally discussed in books on "the great divergence" and "the making of the modern world economy." These normally focus on why Western Europe and various white settler colonies were the first regions to know modern, self-sustaining economic growth, whereas in the rest of the world—with some minor exceptions—economic development and growth stayed so far behind. Britain without any doubt was the first and for some decades the only major industrial country in terms of coal and cotton, but A) Britain's industrialization cannot be simply disconnected from its Western European context; B) after a few decades various Western countries had followed suit while "the rest" still had not done so; and C) even those Western countries that were not industrializing along British lines experienced sustained economic growth and a structural change of the economy.

Western Europe, already in the early modern period, but even more so in the nineteenth century, was too much of an interconnected zone —economically, politically, technologically, and culturally—to completely insulate Britain in an analysis of economic development. The exchange of goods, peoples, and ideas and an international division of labor had already unified it to such an extent that it is misleading to study its industrialization or structural economic change on a strictly land-by-land base.[121] For sure, other western European countries

[121] For the thesis that industrialization was a "European" phenomenon, *see,* for example, Braudel, *Civilisation matérielle, économie et capitalisme,* III, p. 480; Jones, *European miracle,* Introduction to the second edition; O'Brien, "Contribution of the periphery"; and Sidney Pollard, "Industrialization and the European economy" in Mokyr, *Economics of the*

lagged behind Britain. But they were relatively quick in catching up, especially considering the big devastation in the Revolutionary and Napoleonic wars. For sure, they all did so in their own way.[122] But, and this is fundamental, in the nineteenth century they all started a process of structural economic change that ushered in sustained economic growth. Overall the rest of Western Europe did not stay behind and in any case it did so far less than Asia, except Japan.

This "industrial revolution" in the wider interpretation of the term also was strongly propelled by new technologies and by coal and iron.[123] But there was more to it. And, whatever the different routes it took, it always materialized in sustained economic growth accompanied by structural economic change. If we accept this broader interpretation of the term and look at it as a take-off into self-sustained growth and structural economic change, the thesis that Western Europe as a whole industrialized while China and the rest of Asia, except Japan, did not, becomes far more acceptable. Belgium and Switzerland industrialized quite early on. A country like France may not have industrialized fast in the coal and cotton sense, but it had sustained economic growth in the nineteenth century. The same goes even for Italy. Germany did not copy Britain, yet it became an industrial giant. The Netherlands and Denmark in the nineteenth century can hardly be called industrialized nations, but their economies modernized, their inhabitants were wealthy and steadily became wealthier.[124]

If the problem of the great divergence is put in the more encompassing terms of the emergence or non-emergence of modern economic

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Industrial Revolution, pp. 165–76. For a discussion, *see* Patrick Verley, *L'Échelle du monde. Essai sur l'industrialisation de l'Occident* (Paris, 1997), pp. 69–80. For studies that put industrialization in a European perspective, *see,* for example, Bairoch, *Victoires et déboires, II*, pp. 236–56; Landes, *Wealth and Poverty,* which in this aspect is far more convincing than Pomeranz, or for that matter, Frank; and Verley, *L'Échelle du monde*.

[122] Patrick K. O'Brien, "Do we have a typology for the study of European industrialization in the XIXth century?" *Journal of European Economic History* 15 (1986): 291–333.

[123] I refer only to the so-called "first industrial revolution." In the second one, electricity, steel, and chemistry were the driving forces.

[124] In this perspective I am rather surprised by Pomeranz's habit of claiming that Denmark's development somehow resembled what was happening in Asia. *See* Pomeranz, *Great Divergence,* pp. 47, 212, 239–40, 263. Denmark simply became a wealthy country. Its agriculture developed far too many modern characteristics—for example, the application of machinery and fertilizer—and was far too capital-intensive to warrant such a comparison. *See* Bairoch, *Victoires et déboires,* I, p. 443 and II, pp. 211–57, 496; Lennart Jørberg, "The Nordic countries 1850–1914" in Carlo M. Cipolla, ed., *The Fontana Economic History of Europe,* Vol. 4.2 (Glasgow, 1973), pp. 375–485 and Jan Luiten van Zanden, "The first green revolution: the growth of production and productivity in European agriculture, 1870–1914," *The Economic History Review* XLIV (1991): 215–39.

growth and structural economic change, Pomeranz's answers become much less convincing. What is the role of the New World in the industrialization, or more broadly the economic growth, of Switzerland, Belgium, Germany, the Netherlands, northern Italy, and the modern region of Spain? What about that Asian country, Japan, that also industrialized? I expect that many reviewers will confront Pomeranz with these two questions. The first one has been intensively discussed by scholars who think that in the end industrialization was a European phenomenon.[125] The situation in Japan, and especially the comparison between developments there and in China, would be the subject *par excellence* for the next book by Pomeranz. There are many differences between the Chinese and Japanese cases. The fact that Japan industrialized quite early and rapidly, while China did not, is sufficient proof of that. But the fact that there also are many similarities between these two Asian countries may help us to get a more clear focus of what exactly it takes to industrialize than we get by comparing Western Europe and China, which are so different in so many aspects.

The Japanese Case

Like China, or better, even more than China, Japan was a country of mini-farmers who predominantly grew rice. Interestingly, in the light of Pomeranz's thesis, it already faced a deep crisis of ecological exhaustion in the eighteenth century. Conrad Totman in his recent book on Japan's history refers to the period from 1700 to 1820 as a time of stasis and decay.[126] It faced serious shortages of resources like land, water, fertilizer, and bullion. It had a large rural industry. In short, it was a very land-intensive economy in every aspect. As indicated, in Japan just like in Britain, industrialization was preceded by a long period of demographic stagnation. Like Europe and in contrast to China, already in pre-industrial times Japan knew several varieties of monopolistic competition and "mercantilism" in the trade relationships between various domains. Like Western European governments, Japan's government was permanently short of money during the entire eighteenth century.

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[125] See note 121 above.

[126] The information on the history of Japan is gathered from Peter Duus, *Modern Japan,* 2nd ed. (Boston, 1998) and Conrad Totman, *A History of Japan* (Malden, Mass. and Oxford, 2000).

In Meiji times population and production both increased. The agrarian sector was capable of feeding the growing population without undergoing any fundamental, structural change—with an agrarian structure comparable to that of China, and an agriculture that was even more land intensive, Japan managed to export food until 1890, when it really "took off." Its industrialization was borne primarily by internal demand, and financed primarily by internal capital. Japan developed a substantial textile industry and exported cotton. It had some coal and increased its production, but demand outran supply, so overall Japan became an importer of coal. It imported ore, amongst other countries, from China. When it started industrializing, it had no privileged periphery to speak of. The Japanese case, and the comparison between Japan and China, clearly indicates to me that the political economy, in this case the Meiji revolution as compared to the absence of a strong, consistent policy of economic modernization in China, can make a big difference and help in creating a great divergence.

Conclusion

There is more to the emergence of modern economic growth than coal and colonies, even more than coal, colonies, technology, and a state structure geared to coercion of peripheries and collusion on the marketplace. Solving the riddle of the great divergence entails more than asking why Britain industrialized while China did not. Pomeranz has not put a classic question of history to rest, but we all ought to be grateful for the extremely illuminating and intelligent way he has addressed it. This is a great time to be a world historian.