The Triumph of Cotton in Europe*

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One of the striking features in the global history of textiles is how before the late eighteenth century the world was largely divided into two zones. Clothing and households goods in Europe (and in its north American offshoots) were made mainly from wool and flax. In China and India, the other two great centres of population, they were made from cotton and, to a much lesser extent, silk and hemp.[1] Such trade as occurred between Europe and Asia involved the movement of silks and cottons to Europe; few woollens and linens went the other way.

Although cotton fabrics had been used in Europe since the Middle Ages, they were still relatively unimportant in the mid-eighteenth century. Styles' analysis of Old Bailey cases showed that while cotton was prominent among printed fabrics and counterpanes by the 1750s, even by the end of the century it had made little headway among the shirts, shifts and sheets used by the bulk of the population.[2] Roche's study of clothing in Parisian inventories at death found that cottons accounted for about 7% of total value c. 1700, though their share had risen to about a third c. 1789.[3] But these are values for the Parisian elite and would greatly

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[1] Cotton was also the dominant textile fibre in sub-Saharan Africa, Latin America and the rest of Asia.

[2] John Styles, "What were cottons for in the early industrial revolution?", in Giorgio Riello and Prasannan Parthasarathi, eds., *The Spinning World: A Global History of Cotton Textiles* (Oxford: Oxford University Press, 2009), pp. 307-326. It is worth underscoring the importance of printed fabrics in eighteenth-century cotton consumption. The additional value created in finishing would have diluted the higher cost of the raw materials. This was also the most innovative sector of the cotton industry during most of the eighteenth century. On cotton printing, see Serge Chassagne, "Calico printing in Europe before 1780", in David T. Jenkins, ed., *The Cambridge History of Western Textiles* (Cambridge, Cambridge University Press, 2003), I, pp. 513-527.

[3] Daniel Roche, *La culture des apparences: une histoire du vêtement XVIIe-XVIIIe siècle* (Paris: Fayard, 1989), pp. 127, 137

overstate cotton use among the general population. In Europe's north American offshoots an analysis of stocks held by merchants shows that the value of linens held still exceeded that of cottons in the 1760s.[4] Merchant stocks do not take into account local domestic production of textiles, which means that the figures for places in the American North and Canada probably overstate cotton use.

Estimates of aggregate production and consumption tell a similar story. Rough estimates for British consumption c. 1770 based on material compiled by Deane and Cole put cottons at £0.9 m, woollens at £9.0 m and linens at £3.4 m.[5] For France Markovitch's estimates show the value of cotton cloth consumption in the 1780s as 63 m francs, as against 149 m for woollen cloth and 187 m for linen.[6] None of these figures should be taken as particularly precise, but they do confirm the relative unimportance of cottons in eighteenth-century Europe.

During the nineteenth century the use of cottons increased enormously in Europe and North America, but woollens and linens made few inroads in the rest of the world. The situation on the eve of the First World War is summed up in Table 1. The information comes from a surprisingly little-known work by Adolf Kertesz, a Hungarian chemist and historian.[7] *Die Textilindustrie sämtlicher Staaten* was published in Germany in 1917, which may account in part for its relative obscurity. In over 700 pages and with thorough scholarship, Germanic in the best of senses, Kertesz tried to estimate production and trade in raw materials, semi-finished goods and finished goods for all major textile fibres and for all countries in the world.[8] Kertesz's estimates show that in Europe cottons had come to account for almost half of textile consumption by value and in North America for almost two-thirds. In Asia the cotton share was almost seven-eighths, and woollens and linens together accounted for just five per cent of textile consumption there.

Kertesz's estimates for production also show that Europe had become the world's leading textile producer and that it was a net exporter of all four textiles. Europe exported 29 per cent of its cotton output, 16 per cent of woollen output, 37 per cent of silk output, and 14 per cent of linen output. Almost all other major countries (except Japan) were net importers, though it is worth remarking that even at this time imports of cottons into China and India accounted for less than 10 per cent of domestic consumption.

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[4] Robert S. Duplessis, "Cottons consumption in the seventeeth- and eighteenth-century North Atlantic", in Giorgio Riello and Prasannan Parthasarathi, eds., *The Spinning World: A Global History of Cotton Textiles* (Oxford: Oxford University Press, 2009), pp. 227-246: 231.

[5] Phyllis Deane and W.A. Cole, *British Economic Growth, 1688-1959* (2nd ed., Cambridge: Cambridge University Press, 1967), pp. 182-212.

[6] T.J. Markovitch, *L'industrie française de 1789 à 1964—Analyse des faits (suite)* (Paris: Cahiers de l'I.S.E.A, no. 174, juin 1966), tableau de base XVI

[7] P. Krais, "Kertesz, Adolf, 1857-?. - A. Kertesz zum 70. Geburtstag. " *Angewandte Chemie*, 1927, *40*, 731.

[8] Kertesz drew on statistical yearbooks, censuses of production, returns of trade statistics, German consular reports and textile industry sources to make his estimates. His estimates may not be perfect, but they were made using consistent methods and they stand up well against more recent estimates.

Table 1
Consumption of Textiles c. 1914
(m marks)

	Cottons	Woollens	Silks	Linens
Europe	8729	6829	1351	1428
Asia	7281	290	728	140
North America	5439	1867	1027	198
Latin America	717	211	49	70

Source and notes: Adolf Kertesz, *Die Textilindustrie sämtlicher Staaten: Entwicklung, Erzeugung, Absatzverhältnisse : bearbeitet nach den statistischen Unterlagen der einzelnen Staaten für die Baumwoll-, Woll-, Leinen-, Jute- und Konfektionsindustrie* (Braunschweig, 1917). Europe: including Russia and Turkey; Asia: Japan, China, British India and Dutch East Indies. North America: USA and Canada. Latin America: Mexico, Brazil and Argentina. Kertesz estimates total textile consumption for other countries, but does not disaggregate by fibre.

This paper explores three related questions: Why was so little cotton used in Europe before the nineteenth century? Why did cotton use in Europe subsequently increase so markedly? And why did China and India make so little use of flax and wool both before and after the late eighteenth century? The answers have implications for several issues. One concerns relative living standards before the Industrial Revolution. Differences in consumption bundles complicate the comparison of real wages in Europe and Asia, an important aspect of the great divergence debate. That Europeans wore woollens and linens and Asians cottons is analogous to Europeans eating bread and Asians rice. Robert Allen and his collaborators have resolved the latter by invoking caloric equivalence, but there is no such easy way to deal with textiles.[9] If cottons were simply superior to other textiles, as the one-way change in consumption patterns during the nineteenth century would suggest, then taking the similar weights or lengths of cloths of different fibres would tend to overstate Europeans' well-being and understate Asians'.

The rise of cottons also touches on the reasons for the great divergence itself. Pomeranz has argued that, without large imports of raw cotton from the New World, English industrialisation would have been aborted, or at least much reduced, by resource constraints. As against China, England had the advantage in cotton textile production of "ghost acres" stretching across the American South.[10] This argument echoes earlier observations that the English cotton industry was fortunate to benefit from having an elastically supplied raw material.[11] But why did this elastic supply manifest itself only in the nineteenth century?

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[9] Robert C. Allen, Jean-Pascal Bassino, Debin Ma, Christine Moll-Murata and Jan Luiten van Zanden, "Wages, prices and living standards in China, 1738-1925: in comparison with Europe, Japan, and India", *Economic History Review*, 64, s1 (2011), 8-38: 20-26

[10] Kenneth Pomeranz, *The Great Divergence* (Princeton, Princeton University Press, 2000), ch. 6.

[11] See, for example, Michael M. Edwards, *The Growth of the British Cotton Trade, 1780-1815* (Manchester, Manchester University Press, 1967), p. 75; Douglas A. Farnie, *The English Cotton Industry and the World Market, 1815-1896* (Oxford, Clarendon Press, 1979), p. 82.

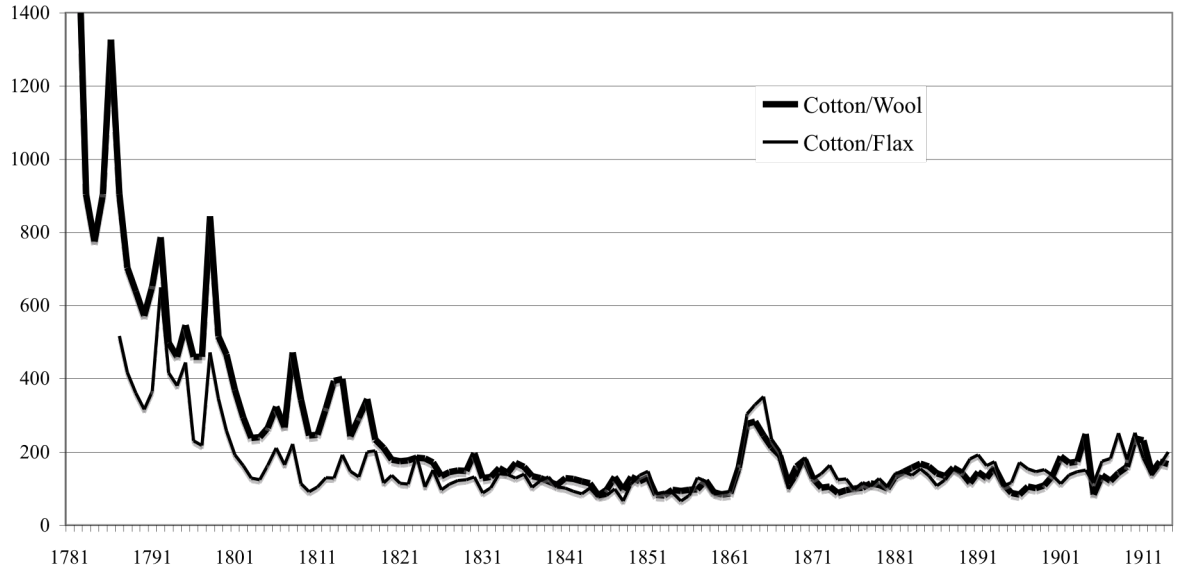
The changes in European consumption patterns during the late eighteenth and nineteenth centuries influenced the fates of the different textile industries in Europe. It is obvious that in Europe the cotton industry grew much faster than the woollen and linen industries. European regions which had already specialized in cotton or mixed-cotton fabrics in the eighteenth century, notably Greater Lancashire (Lancashire and adjacent parts of Cheshire, Derbyshire and Yorkshire), tended to prosper disproportionately in the nineteenth century. Those that specialized in other textiles, but especially linens, often faced relative decline or conversion to other activities.

Why then did cotton supplant wool and flax in Europe? The answer, in short, is American ingenuity. Technological and organizational changes in the cultivation, ginning and baling of cotton in the American South led to a drastic fall in the price of cotton relative to the other textile fibres. After documenting this price change, the paper investigates its causes and assesses its implications for Europe's different textile industries, for the traditional suppliers of cotton to Europe, for Asian producers of cotton, and for the great divergence.

Cotton became much cheaper in the early nineteenth century

Figure 1 shows the prices of cotton relative to wool and flax in the British market over the long nineteenth century, from the 1780s to the eve of the First World War. From the late 1780s to the 1830s the price of cotton relative to wool fell to just 14 per cent of its initial level; that of flax to 29 per cent. The relative prices of cotton continued to fall, albeit much more slowly, until mid-century, and then rose, only modestly, until the eve of the First World. What is clear is that the changes in the early nineteenth century marked a definitive shift in textile raw material prices in favour of cotton.

Figure 1
Relative price movements, England, 1785-1914
(1850-59=100)



Sources and notes: cotton and wool: B.R. Mitchell, *Abstract of British Historical Statistics* (Cambridge: Cambridge University Press, 1962), pp. 490-491, 494-496; flax: 1785-1850:

"British prices of thirty-five commodities", London School of Economics Library, microfilm; 1851-1914: *Economist.*

These relative price calculations may understate the shift in favour of cotton for a couple reasons. One is that from the mid-1790s there was a change in the nature of the cotton being used in the English textile industry as American short-staple cotton became available and quickly came to dominate the market. Before the 1790s most of the cotton used had been relatively expensive, long-staple cotton from the West Indies or Brazil. The cotton price series underlying Figure 1 had to be constructed by splicing a price series for West Indian cotton onto that for American cotton. This splice involved adjusting the prices for West Indian cotton downwards in line with relative values in the late 1790s, but this adjustment conceals to some extent the way in which cotton became cheaper in the hands of European manufacturers. The other reason that the relative price change may be understated is that the price series for flax refers to a relatively coarse grade of Russian flax being imported into the U.K for the production of canvas and sacking. If good price series were available for higher qualities of flax, most of which was still grown in western Europe until the mid-nineteenth century, then the price of cotton relative to flax would most likely be seen to have fallen more than is shown in Figure 1.

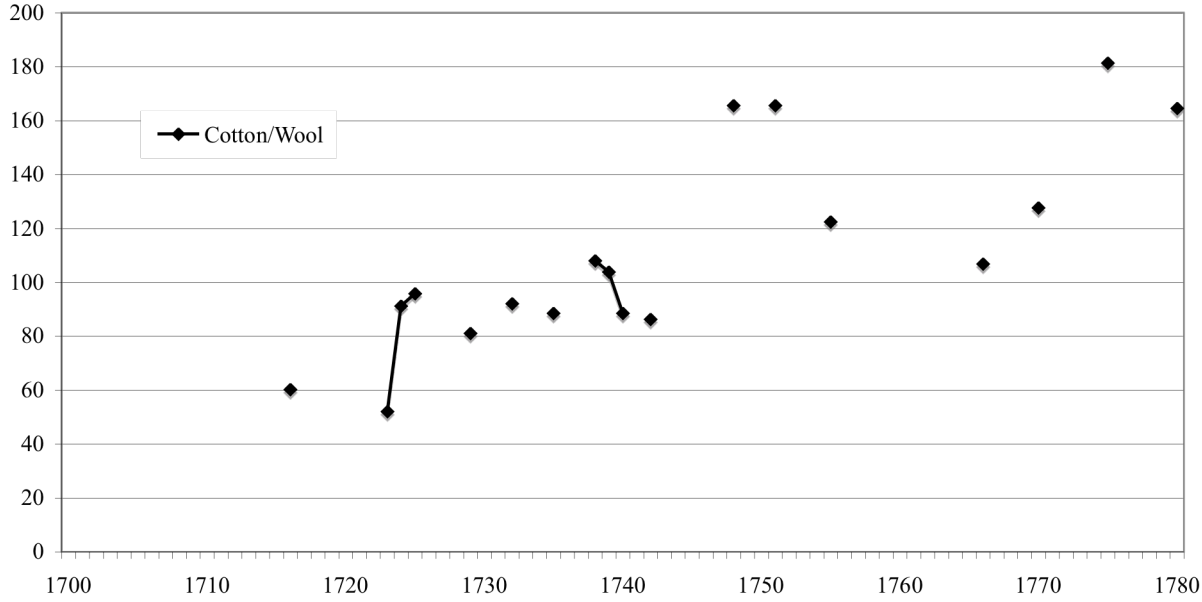
This relative price change became more apparent over time. Wartime conditions, as well as the American embargoes on cotton, led to large price movements. With the coming of peace the volatility of relative prices fell. Before 1822 it was 0.28 for wool relative to cotton and 0.33 for flax relative to cotton; from 1822 to 1859 it was 0.19 and 0.28. Underlying these changes were a fall in the volatility of cotton prices, an increase in the volatility of wool prices and little change in the volatility of flax prices.

What happened before the 1780s? Good British prices series for cotton and flax are wanting for the eighteenth century, but Wadsworth and Mann did collect scattered observations on cotton prices. What they imply about the price of cotton relative to wool is shown in Figure 2. Cotton was becoming a dearer raw material during most of the eighteenth century, which means that the fall in its relative price from the 1780s was a marked reversal of trend. This conclusion can be confirmed by developments in the Amsterdam market, for which price data are more abundant.[12] Whilst there is a good deal of short-term volatility in relative prices, Figure 3 shows that there are certainly hints of upward trends in the relative price of cotton, particularly from the mid-eighteenth century. In any case there is certainly no indication of the fall in the relative price of cotton that was to come.[13] The Amsterdam series also show that the very high prices of cotton relative to wool in the 1780s were unusual, which suggests that the trend decline in relative cotton prices was a phenomenon that began in the 1790s than in the 1780s.

[12] Hemp prices are substituted for flax prices because the series was more complete. The trends in hemp and flax prices were similar.

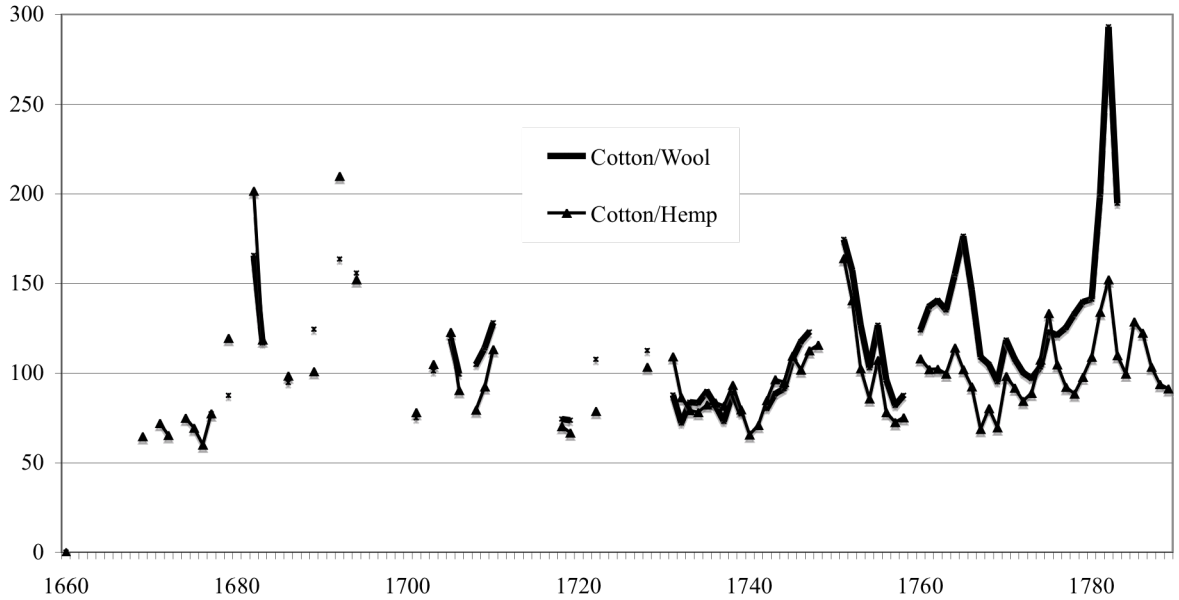
[13] The Amsterdam textile prices become much less abundant after the 1780s, but observations in the early 1830s show a marked fall in the relative price of cotton similar to that seen in England.

Figure 2
Relative Price Movements, England, 1716-1780
(1738-1740=100)



Sources: cotton: A.P. Wadsworth and J. De Lacy Mann, The Cotton Trade and Industrial Lancashire (Manchester, Manchester University Press, 1931), pp. 522-523; wool: B.R. Mitchell, *Abstract of British Historical Statistics* (Cambridge: Cambridge University Press, 1962), pp. 494.

Figure 3
Relative Price Movements, Amsterdam, 1664-1789
(1742-1747=100)



Source: N.W. Posthumus, *Nederlandsche prijsgeschiedenis* (Leiden: Brill, 1943), pp. 257-259 (Thorn wool), 281-283 (Smyrna cotton), 299-302 (Riga clean hemp).

American ingenuity made for cheap cotton

Why was there such a large change in relative prices of textile raw materials between the 1790s and the 1830s? This does not seem to have been the result of changes in demand. According to estimates by Gavin Wright, the demand for cotton grew much more rapidly in the early nineteenth century than it did after the American Civil War.[14] Although we have no comparable estimates for wool or flax, the estimates for cotton, and the spectacular expansion of the European cotton industry, suggest that, if anything, the relative price of cotton should have been increasing during the early nineteenth century, then declining during the late nineteenth century. That is just the opposite of what occurred.

The explanation for the shift in relative prices is thus likely to lie on the supply side. Until the mid-nineteenth century Europe largely depended on domestic supplies of flax and wool. Rapid population growth in Europe drove up the demand for food, the production of which competed with sheep for land and with flax for labour. Although Hudson has suggested that, had the incentives been right, upland areas in Britain and on the continent could have been much more densely populated with sheep, by the early nineteenth century many of these areas were already being quite intensely exploited.[15] Hudson also does not address the question of at what price this additional wool would have been available. One indicator of pressure on European supplies of wool during the first half of the nineteenth century is that in England the price of wool relative to wheat roughly doubled.[16]

Cotton production, by contrast, proved to be easily extended westward across the southern United States, which made possible rapid growth in output. This abundant land available to American planters suggests a Heckscher-Ohlin story about the change in relative prices. Relative factor supplies were certainly different in Europe and the American South, but this explanation does raise some questions about timing and impact. What change in factor supplies accounts for the reversals in relative price trends, first in the late eighteenth century, then again in the 1850s? Can changing factor supplies explain such a large change in relative prices?

Fortunately, there appear to be other, probably more powerful, changes taking place in the early nineteenth century. The westward expansion of cotton production involved not only more land, but better land. Aided by the mobility afforded by slave labour, planters were able rapidly to take advantage of fertile alluvial soils in the western river basins. Olmstead and Rhode estimate that this regional reallocation of cotton production accounted for about half of the increase in output per worker in southern cotton production during the early nineteenth century.[17]

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[14] Gavin Wright, *The Political Economy of the Cotton South* (New York, 1978), pp. 90-97

[15] Pat Hudson, "The Limits of Wool and the Potential of Cotton in the Eighteenth and Early Nineteenth Centuries", in Giorgio Riello and Prasannan Parthasarathi, eds., *The Spinning World: A Global History of Cotton Textiles, 1200-1850* (Oxford, 2009), pp. 327-350: 330-7.

[16] For wheat prices, Peter M. Solar and Jan Tore Klovland, "New series for agricultural prices in London, 1770-1914", *Economic History Review*, new series, 64, 1 (2011), 72-87: 84-87. For wool prices, B.R. Mitchell, *Abstract of British Historical Statistics* (Cambridge: Cambridge University Press, 1962), pp. 495.

[17] Alan L. Olmstead and Paul W. Rhode, "Productivity Growth and the Regional Dynamics of Antebellum Southern Development", in Paul W. Rhode, Joshua L. Rosenbloom and David F. Weiman, eds., *Economic Evolution and Revolution in Historical Time* (Stanford: Stanford University Press, 2011), pp. 180-212: 192-195.

Overall labour productivity growth was substantial, so the half not accounted for by westward movement is also significant. Between 1800 and 1840 the number of bales of cotton produced per slave roughly doubled in both the Old South and the New South.[18] Improved cotton varieties, introduced from the 1810s to the 1840s, increased crop yields and facilitated picking, at least doubling the amount of cotton that a hand could pick per day.[19] The introduction of saw gins, along with continuing improvements in both roller and saw gins, led to large increases in fibre output per day. In the 1780s a worker might turn out 25 lbs a day on a roller gin. In the 1790s the early saw gins, the sort that Whitney invented, could process about 100 lbs per day. By the 1830s horse- or water-powered saw gins were yielding upwards of 1000 lbs per day.[20] Since these larger gins involved much larger capital expenditure and the labour of several workers, these figures overstate the increase in productivity, but it was still substantial.

The cotton, once ginned, was then compressed into denser and denser bales for shipping. As Harley has shown, the use of mechanical presses on plantations and at the ports roughly doubled the density of cotton bags from the late eighteenth century to the 1840s. This increased density accounted for most of the halving of freight costs for cotton shipped to Europe.[21] Denser bales probably also reduced the costs of transport at both ends of the cotton's journey, on the rivers of the American South and on the canals and later railways of industrial England.

Production of the other textile fibres was not subject to the same degree of technological change. The methods of flax cultivation and preparation during the late eighteenth and early nineteenth centuries seem to have remained largely unchanged. There was some mechanization of flax scrutching, but attempts at chemical or mechanical retting proved unsuccessful.[22] The major improvement in wool supplies in the early nineteenth century was the development of fine-woolled merino sheep in Saxony and their diffusion in Germany and eastern Europe. This filled a gap at the top of the market, but was unlikely to have had a significant effect on the cost of other wools. Increasingly woollen manufacturers had to adapt to the demands of the meat market. Most breeding changes aimed at producing more and better mutton, and farmers tended to sell animals when the meat rather than the wool was best. The byproduct, skin wool, was often of very short staple.[23]

The reversal of relative price trends after mid-century also has a supply side story. From the 1850s non-European sources of wool, from Australia, South America and South Africa, were starting to have a significant impact on supplies. In addition, the use of recycled wool became common: by the late nineteenth century it accounted for about half of the raw material

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[18] Olmstead and Rhode, "Productivity Growth", p. 193.

[19] Alan L. Olmstead and Paul W. Rhode, "Biological Innovation and Productivity Growth in the Antebellum Cotton Economy", *Journal of Economic History*, 68 (2008), 1123-1171

[20] Angela Lakwete, *Inventing the Cotton Gin: Machine and Myth in Antebellum America* (Baltimore: Johns Hopkins University Press, 2003), pp. 146-147.

[21] C. Knick Harley, "Ocean freight rates and productivity, 1740-1913: the primacy of mechanical invention reaffirmed", *Economic History Review*, 48, 4 (1988), 851-876: 859-860

[22] Alex J. Warden, *The Linen Trade* (London, Longman, 1864), pp. 3-40.

[23] David T. Jenkins and Kenneth G. Ponting, *The British Wool Textile Industry, 1770-1914* (London: Heinemann, 1982), pp. 43-48; Andrew K. Copus, "Changing Markets and the Developmnt of Sheep Breeds in Southern England, 1750-1900", *Agricultural History Review*, 37, 1 (1989), pp. 36-51.

employed by the British woollen industry.[24] As for flax, cultivation increasingly took place on Europe's frontier, in the northern parts of Russia, and may have been stimulated further by the emancipation of the serfs in the early 1860s. By contrast, American cotton cultivation without irrigation may have been reaching its limits in Texas and Arkansas. The late nineteenth century reversal of price trends may also have a technological, or what may be perhaps better described as an ecological, component. Well before the devastating advent of the boll weevil in the 1890s, cotton producers in the southern United States faced a number of threats. From the 1840s onward they struggled to maintain yields against cotton rot and attacks by the boll worm and the cotton worm.[25]

Cheaper American cotton contributed to the reconfiguration of the European textile industry

The dramatic fall in the relative price of cotton influenced the shape of the European textile industry in the nineteenth century. It is well known that the cotton industry grew much faster than the woollen or linen industries. The obvious reason is the reduction in the cost of cottons ensuing from the mechanization first of spinning, then of weaving. The overall effects, based on calculations by Knick Harley and in deflated prices to show their impact relative to other goods, are summarized in Table 2. But note that a bit more than a fifth of the fall in costs was accounted for by cheaper cotton. Moreover, Harley's calculations pertain to a relatively fine sort of cloth, so they probably understate the importance of this factor. For coarser cloth the share of raw materials may have been a third or more, instead of the quarter shown here.[26]

Table 2
Cost components of Nield printing cloth
(shillings, in prices of 1820-4)

	Cotton	Spinning		Weaving	Total
		Warp	Weft		
Early 1780s	12.7	13.8	9.5	14.9	50.5
Late 1830s	3.7	1.4	1.2	3.2	9.5

Source: C. Knick Harley, "Textile Prices and the Industrial Revolution", *Economic History Review*, 51, 1 (1998), 49-83: 64, 82

The cost reductions due to mechanization were clearly more important than the fall in raw material prices, but relative to other textiles, they were, at least in part, temporary. Cotton was mechanized first because it is a relatively elastic fibre that could resist the stresses imposed by fairly crude machines and because it did not require any special processing before spinning. Yet, though it took time, the new techniques were subsequently adapted to spinning and weaving wool and flax. Both jennies and mules were used fairly quickly in the woollen industry. The water frame was more suited to spinning worsted yarn, but it took 20-30 years for it to become fully operational. In flax spinning coarse yarns were spun by machine from

[24] David T. Jenkins, "The western wool textile industry in the nineteenth century", in David T. Jenkins, ed., (2 vols, Cambridge: Cambridge University, 2003), vol II, pp. 761-789: 768, 770.
[25] Olmstead and Rhode, "Biological Innovation", pp. 1161-1164.
[26] C. Knick Harley, "Cotton Textile Prices and the Industrial Revolution", *Economic History Review*, 51, 1 (1998), p. 71 shows a contemporary calculation where raw materials, spinning and weaving each accounted for a third of the cost of unfinished cloth.

the 1790s; fine yarns could not be produced until wet-spinning was introduced in the mid-1820s. On the weaving side, both woollen and linen producers took up power looms within a decade or so of their use in cotton production, though it was not until the 1850s that fine linens could be woven by machine.

There are few price series for woollen or linen yarn and cloth that permit calculations similar to Harley's for cotton. Some rough calculations, shown in Table 3, can be made from Dundee prices for flax, linen yarn and linen cloth for the period covering the first four decades of the nineteenth century. They suggest that the cost reductions in the spinning and weaving of linens were smaller than those for cottons, but not dissimilar in magnitude. The falls in fibre prices were much less similar.

Table 3
Cost reductions, 1801/5-1835/9
(percentage change)

	Linens	Cottons
Fibre	-39	-65
Spinning	-60	-70
Weaving	-66	-69

Sources and notes: linens: based on the assumption that raw materials, spinning and weaving each accounted for a third of total cost and the prices for Riga PTR flax, 3 lb linen yarn and 24 Osnabrugh linen cloth taken from Alexander J. Warden, *The Linen Trade Ancient and Modern* (London: Longman, 1864), pp. 639-647; cottons: C. Knick Harley, "Cotton Textile Prices and the Industrial Revolution", *Economic History Review*, 51, 1 (1998), p. 71.

By the mid-nineteenth century cotton producers probably retained some cost advantages from easier and earlier mechanization, but these had been significantly augmented by the large fall in the relative price of their raw material. It is thus not surprising that areas specialized in cotton production prospered, and that those specialized in the other textiles showed more limited gains or declined.

Cheaper American cotton drove out Europe's traditional suppliers

The falling cost of American cotton should have put considerable pressure on the traditional suppliers of cotton to the European textile industry. This should have shown up in lower exports, less cultivation and lower farm incomes, but it is not easy to find information on all of these indicators. Here we shall concentrate on the West Indies, Mexico, and Greece and Anatolia since they had been the main sources of shorter staple cotton. Cotton from Brazil and Egypt was of longer staple, hence less subject to direct competition from that produced in the American South.[27]

British imports of raw cotton from the West Indies grew during the late eighteenth century, reaching their peak during the first years of the nineteenth century (Table 2). But after the French wars they rapidly fell into insignificance, despite U.K. import duties on raw cotton

[27] Michael M. Edwards, *The Growth of the British Cotton Trade, 1780-1815* (Manchester, Manchester University Press, 1967), p. 105.

becoming increasingly favourable to the West Indies. Planters redeployed land from the production of cotton to that of sugar.[28] This was not because sugar was particularly profitable, since rates of return to sugar cultivation were distinctly lower than they had been both during the wars and during most of the eighteenth century.[29] The shift of resources from cotton to sugar may even have exacerbated the fall in the profitability of sugar cultivation.

Mexican exports of cotton went primarily to Spain and were not particularly large.[30] Much more cotton was woven into cloth for domestic consumption and export to other Spanish colonies. Estimates for cotton production in Mexico made in the mid-nineteenth century, though of unknown provenance and reliability, indicate that in the late eighteenth century Mexican cotton production was higher than that in the West Indies and Brazil put together.[31] They also indicate that production fell off during the early nineteenth century. Some of the decline might be attributed to the disruptions of the Mexican war of independence, but the subsequent recovery was only possible due to high tariffs on raw cotton and manufactured cotton goods.[32]

The only serial evidence on the Middle East that covers the entire period concerns U.K. imports of raw cotton (Table 4). Imports from the Near East, which is essentially the Ottoman Empire, were very irregular, probably because some cotton was reshipped from ports in southern Europe. If the two sources are added, then a fairly clear downward trend in imports manifests itself.

Table 4
Value of U.K. Imports of Raw Cotton
(£ 000)

	Southern Europe	Near East	Medi -terranean	West Indies	U.K Imports	Share Med	Share WI
1784-6	262	198	460	890	1817	25	49
1794-6	784	260	1044	1243	2760	38	45
1804-6	858	5	863	1919	5628	15	34
1814-6	491	7	498	1898	8593	6	22
1824-6	115	567	675	304	7456	9	4
1834-6	91	104	195	99	14494	1	1

[28] Barbara Gaye Jaquez, "The Caribbean Cotton Production: An Historical Geography of the Region's Mystery Crop" (unpub Ph.D. thesis, Texan A&M Universary, 1997), pp. 81-91.
[29] J.R. Ward, "The Profitability of Sugar Planting in the West Indies", *Economic History Review*, new series, 31 (May 1978), 197-213: 207.
[30] In the early 1790s Spanish imports of cotton from they were only a few hundred thousand pounds. Spain's principal American supplier of cotton was Venezuala. (James Thomson, "The Development of the Spanish Trade in American Cotton: Transatlantic Synergies in the Age of Enlightenment", *Revista de Historia Económica. Journal of Iberian and Latin American History* 26, 2, (2008), pp. 277-313.
[31] "The Producers of Cotton", *Debow's Review*, 1, 1 (Jan. 1866), p. 99. The ultimate source for these estimates may be the introduction to the 1860 census of agriculture.
[32] Jan Bazant, "Evolution of the Textile Industry of Puebla", *Comparative Studies in Society and History*, 7, 1(1964), 56-69: 67-68; Rafael Dobado Gonzalez, Aurora Gomez Galvarriato and Jeffrey G. Williamson, "Mexican Exceptionalism: Globalization and De-Industrialization, 1750-1877", *Journal of Economic History*, 68, 3 (Sept. 2008), 1-54: 9-16.

Source: Ralph Davis, *The Industrial Revolution and British Overseas Trade* (Leicester, 1979), pp. 110-121. Southern Europe: Spain, Portugal, Italy. Near East: Turkey, Balkans, Egypt and Russian Black Sea ports. Davis notes that "there are some small inconsistencies due to the changing geographical categories of the Customs ledgers, notably in the Near East, where the Turkish Empire's boundaries changed…." (p. 82).

The Empire also shipped large quantities of cotton to France, especially to Marseille (Table 5). In the 1780s over two-thirds of this trade to France was from the port of Smyrna (Izmir), with Salonica (Thessalonika) accounting for another fifth. From the hinterland of Salonica there were, in addition, exports of raw cotton overland to Austria and Germany (Table 6).

Table 5
Value of Ottoman raw cotton exports to Marseilles
(1000 livres tournois)

	Raw cotton	Cotton thread
1700-1702	225	1303
1750-1754	3760	1924
1786-1789	9853	2939

Source: Bruce McGowan, *Economic Life in Ottoman Europe* (Cambridge: Cambridge University Press, 1981), p. 43.

Table 6
Exports of raw cotton from Salonica, 1796
(bales)

France	12000
Italy	7000
England and Netherlands	50000
Germany	30000

Source: N.G. Svoronos, *Le commerce de Salonique qu XVIIIe siècle* (Paris: Presses Universitaires de France, 1956), p. 249

Cultivation of and trade in cotton suffered in these areas after the French wars. In the hinterland of Smyrna competition from American cotton caused the entire network of cultivators, intermediaries and merchants to shift from cotton to grapes, figs, oak gall and madder, which became the port's leading exports in the early nineteenth century.[33] In Macedonia the cotton boom collapsed after the Peace of Vienna, which McGowan attributes to increased competition from Egyptian cotton. Local producers shifted toward wheat, which replaced cotton as Salonica's leading export.[34] In Acre, a major Levantine port for the

[33] Elena Frangakis-Syrett, "Les reseaux commerciaux et l'integration au marché mondial de la Méditerranée Orientale, un aperçu historique", in Marcel Bazin and Lyazid Kichou, eds, *Méditerranée et Mer Noire entre mondialisation et régionalisation: Actes du Colloque International d'ANTALYA* (Paris: Harmattan, 2000), pp. 183-196.

[34] Bruce McGowan, *Economic Life in Ottoman Europe* (Cambridge: Cambridge University Press, 1981), p. 134. See also Socrates D. Petmezas, "Patterns of Protoindustrializatin in the Ottoman Empire. The Case of Eastern Thessaly, ca. 1750-1860", *Journal of European*

shipment of cotton, the trade was dead by 1821, despite concerted efforts by the local pasha to revive it.[35]

The exception to this picture of declining cotton cultivation in the Near East was Egypt. In the late eighteenth century the native cotton was of poor quality, inferior to Indian cotton, and was used only by local artisans for the manufacture of cheap clothes and upholstery.[36] Egyptian cotton exports only took off when the variety *Gossypium barbadense L* was introduced from the New World in the early 1820s. This was a high-quality, long staple cotton that commanded premium prices among spinners and was produced mainly for export to the U.K. (it is thus unlikely to have competed with Macedonian production). Exports rose quickly to around 25 m lbs, but rarely exceeded that level for the next twenty years.[37]

Cotton cultivation in the rest of the Ottoman Empire did not cease. Much continued to be grown for local hand spinning and weaving, particularly in eastern Anatolia.[38] But even this local production was increasingly displaced by imported yarn and cloth. Between the early 1820s and early 1840s imports of yarn and cloth increased from 600 tons to 6,750 tons. On Pamuk's reckoning hand spinning of indigenous cotton fell, or at best stagnated, in this period.[39]

Cheaper American cotton had a limited impact in Asia

Despite the drastic fall in its price, American cotton had little direct impact on Asian markets. Neither India nor China imported significant quantities of American cotton during the nineteenth century, even as they developed their own mechanized industries, and India continued to export cotton to Britain and elsewhere. The United States did export some raw cotton to Japan before the First World War, but Japanese industry drew primarily on India for its raw materials. It also imported cotton from China, in similar quantities to those that were drawn from America.

The impact of American cotton could have been indirect, through imports of yarn and cloth from Europe. Yet this does not seem to have been the case. Kertesz's figures (Table 7) show that on the eve of the First World War China consumed only 12 per cent more cotton than it

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Economic History, 19, 3 (1990), 575-603: 595-597. I am grateful to Athanasios Gekas for drawing my attention to this reference.

[35] Thomas Philipp, *Acre: The Rise and Fall of a Palestinian City, 1730-1831* (New York: Columbia University Press, 2001), p. 130.

[36] M.E. Abdel-Salam and A.M. El-Sayed Negm, "The Egyptian Cotton: current constraints and future opportunities" (Alexandra, Textile Industries Holding Co, 2009), ch. 1 (http://www.icac.org/econ_stats/country_facts/e_egyptian_constraints_opportunities.pdf; accessed 8 Sept 2011)

[37] E.R.J. Owen, *Cotton and the Egyptian Economy, 1820-1914* (Oxford; Clarendon Press, 1969), pp. 34, 73.

[38] Donald Quataert, *Ottoman Manufacturing in the Age of the Industrial Revolution* (Cambridge, 1993), p. 36.

[39] Şevkut Pamuk, *The Ottoman Empire and European Capitalism, 1820-1913* (Cambridge: Cambridge University Press, 1987), p. 115. Pamuk's estimates have been criticized for understating handspinning in the late nineteenth century, but this should not influence his conclusions about trends in the 1820s and 1830s (Donald Quataert, *Ottoman Manufacturing in the Age of the Industrial Revolution* (Cambridge, 1993), p. 14).

produced and India produced much more than it consumed. As has been frequently bemoaned in Indian economic history, the country came to export raw cotton and import manufactured cloth. But in terms of raw cotton India was still a large net exporter, to the extent of 30 per cent of its crop.

Table 7
Cotton consumption in India and China, 1912
(1000 metric tons)

	China	India
Cotton production	950	768
Cotton imports	2	28
Yarn imports (raw cotton equivalents)	137	26
Cloth imports (raw cotton equivalents)	28	210
Cotton exports	53	375
Yarn exports (raw cotton equivalents)	0	108
Cloth exports (raw cotton equivalents)	0	6
Cotton consumption	1064	544

Source and notes: Adolf Kertesz, *Die Textilindustrie sämtlicher Staaten* (Braunschweig, 1917), pp. 599-631. Yarn and cloth imports were converted to raw cotton equivalents by allowing for wastage of 14.4 per cent for India and 17 per cent for China.

Cotton production was almost certainly increasing in both India and China over the nineteenth century. Population was growing in both countries. Stagnation in cotton production would, allowing for trade, imply that Indian consumption of cotton per capita had fallen by half and Chinese consumption per capita by a quarter. Any decline in production would imply even larger falls in domestic consumption. Yet the scattered figures collected by Roy indicate that per capita consumption in India remained much the same, or even increased somewhat, over the century.[40] Constant per capita consumption would imply that cotton production in India roughly doubled over the nineteenth century and in China it increased by about two-thirds. Such increases are consistent with extensions of cotton cultivation in the northern parts of both India and China.

Before the nineteenth century cotton was expensive in the western hemisphere

The differential effects of the advent of American cotton on producers in the western and eastern hemispheres suggest that up to the 1780s cotton was cheap in Asia and expensive in Europe and the Americas. The falling cost of American cotton brought prices in the west down toward those in the east.

[40] Tirthankar Roy, "Consumption of cotton cloth in India, 1795-1940", CEPR Discussion Paper no. 8669, Nov. 2011; to appear in the *Australian Economic History Review*. Note that Roy, based on inferences about the acreage under cotton, reckons that output roughly tripled.

Comparison of prices among the supply regions confirms this story. In the 1780s the price of cotton at Salonika was 14-19 d/lb.[41] In Jamaica it was about 15 d/lb.[42] The price of cotton at shipping ports in the United States in the early 1790s was reckoned to be 15.5 d/lb.[43] Prices were much, much lower in India. In Bengal cotton sold for 3 d/lb in 1781, rising to 6 lb/lb in 1789.[44] At Surat, near Bombay, its price was 3.5 d/lb in 1789.[45] In the 1790s the price of cotton in China was 6-8 d/lb, above that in India but still went below the level in the western hemisphere.[46]

The prices in India are so much lower, yet little cotton was exported from India to Britain in the 1780s and early 1790s. Was it so much more expensive to ship cotton to Britain was India than it was from North America or the Mediterranean? There are indications that freight rates were indeed quite high. Wadsworth and Mann cite an estimate made by the East India Company in 1698 that put the prime cost of cotton in India at 3.5 d/lb and freight at 7.3 d/lb.[47] Davis cites general freight rates from India c.1770 of £30-35 per ton, and notes elsewhere that since cotton took up three or four times as much space as other cargoes, it payed rates adjusted accordingly. Davis's figures suggest that freight rates for Indian cotton in the late eighteenth century may have been in the range of 10-15 d/lb, enough perhaps to discourage trade.[48] As late as the 1780s, when there was a government initiative to encourage shipments of cotton from India, neither the East India Company nor private merchants showed much interest. Both were more interested in sending cotton to China.[49]

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[41] N.G. Svoronos, *Le commerce de Salonique qu XVIIIe siècle* (Paris: Presses Universitaires de France, 1956), p. 247. Converted from oques per piastre at 1.282 lbs per oque and 19.78 pence per piastre.

[42] Bryan Edwards, History, *Civil and Commercial, of the British Colonies in the West Indies* (2 vols., Dublin, Luke White, 1793), p. 265

[43] J. Forbes Royle, *On the Culture and Commerce of Cotton in India and Elsewhere* (London, Smith & Elder, 1851), p. 16.

[44] John Chapman, *The Cotton and Commerce of India* (London, John Chapman, 1851), p. 367. For the early 1790s Stephen Broadberry and Bishnupriya Gupta take 5 d/lb as the price in Bengal ("Lancashire, India, and shifting competitive advantage in cotton textiles, 1700-1850: the neglected role of factor prices", *Economic History Review*, 62,2 (1009), 279-305: 291).

[45] J. Forbes Royle, *On the Culture and Commerce of Cotton in India and Elsewhere* (London, Smith & Elder, 1851), p. 34.

[46] It has been difficult to obtain good prices for cotton in China. In 1791 cotton sold for 6.2 d/lb in the Shanghai region ("Ma Xueqiang, Qingdai Jiangnan Diqude Wujia Yu Junmin Shenghuo: Yi Shanghai Weili" (Commodity Prices and People's Livelihood in the Jiangnan Region during the Qing Period: the Shanghai Case), *Social Sciences*, 11 (2003), p. 110). In 1796 it was reckoned that 15,000 bales would produce in China 15 lacs of Bombay rupees, implying a price of 7.8 d/lb (British Library, India Office Records, H/374, 11 November 1796. In the late seventeenth century a number of observations for cotton prices show an average of 1.3 d/lb, as against 6-11 d/lb in England (Yao Tinglin, *Linian ji* (An account of the successive years), in *Qingdai riji huichao* (Shanghai, 1982), pp. 99, 104, 106, 109, 112, 116, 129, 133, 136, 138, 143, 149, 152, 153, 156). I am grateful to Kent Deng for supplying me with the 1791 observation and to Xianping Su for help in extracting the late seventeenth century prices.

[47] Alfred P. Wadsworth and Julia de Lacy Mann, *The Cotton Trade and Industrial Lancashire, 1600-1780* (Manchester, Manchester University Press, 1931), p. 183, n. 8.

[48] Ralph Davis, *The Rise of the English Shipping Industry* (Newton Abbot, 1962), pp. 178, 263.

[49] Michael M. Edwards, *The Growth of the British Cotton Trade, 1780-1815* (Manchester, Manchester University Press, 1967), pp. 80-82; Pamela Nightingale, *Trade and Empire in Western India, 1784-1806* (Cambridge: Cambridge University Press, 1970), ch. 5.

By the 1830s the hemispheric price difference had been much reduced. The shipping price for American cotton was reckoned at 6 d/lb. Average export prices in India were about 4 d/lb in Bombay, 3.5 d/lb in Madras and 2.75 d/lb in Calcutta.[50] These differences are not far from the difference in price between American and Indian cotton in the Liverpool market, where Indian cotton was always at a discount due to its lower quality.

What is surprising is that in spite of the fall in the price differential, substantial quantities of Indian cotton began to be exported to Britain from the late 1810s. Freight rates appear to have fallen sharply. In the mid-1810s rates for cotton were only about 2.5 d/lb and by the mid-1820s they were down to about 1 d/lb.[51] There may be several reasons for this large fall. First, there is evidence that more powerful baling presses were being imported into India from the 1790s, which probably had an effect on cotton freight rates from India similar to that on rates from the United States.[52] Second, there may have been improvements in shipping. From the mid-1780s to the mid-1820s the average tonnage of East India ships increased by more than 60 per cent and these ships seemed to be making significantly more voyages.[53] Finally, the end of the East India Company's monopoly in 1813 may have brought more competition. This large fall in trade costs, which also shows up in falling markups on coffee, cloves and black pepper, deserves further investigation.[54]

Before the nineteenth century cotton was clearly more costly in Europe and the Americas than in Asia, but whether it was more expensive is really an issue of relative prices. Unfortunately, there are even fewer indications of wool, flax or hemp prices in Asia than there are for cotton prices. Indeed, the scarcity of prices may itself be an indication that these fibres were relatively expensive. One indirect indicator for the price of wool is that of mutton. Allen's comparisons of Chinese and English prices c. 1704 show that whilst the price of cotton cloth in Canton was only 30 per cent of that in London, the price of mutton was 68 per cent higher, which would seem to suggest that wool, at least, was relatively expensive in China.[55]

For want of prices the relative cheapness of cotton in Asia before 1800 might be inferred from the choices made by Chinese and Indian consumers. Wool seems to have had little or no place in Chinese textile history. Kuhn's survey of Chinese textile technology mentions wool only in two brief comparisons to Europe, and a recent survey of the last 350 years of Chinese textiles does not mention wool at all.[56] Some wool was used in making blankets and carpets, but little

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[50] J. Forbes Royle, *On the Culture and Commerce of Cotton in India and Elsewhere* (London, Smith & Elder, 1851), pp. 16, 69.
[51] John Chapman, *The Cotton and Commerce of India* (London, John Chapman, 1851), p. 68.
[52] British Library, India Office Records, H/374, 21 May 1794, 18 October 1797.
[53] Charles Hardy and Horatio Charles Hardy, *A Register of Shiops Employed in the Service of the Honorable The United East India Company* (London: Heseltine, 1811), pp. 105-109; *Supplement to a Register of Ships* (London: Parbury, Allen & Co, 1835), pp. 31-35.
[54] Kevin H. O' Rourke and Jeffrey G. Williamson, "After Columbus: Explaining Europe's Overseas Trade Boom, 1500-1800", *Journal of Economic History*, 62, 2 (2002), 417-456: 425.
[55] Robert C. Allen, "Mr Lockyer meets the index number problem: the standard of living in Canton and London in 1704", typescript, July 2004.
[56] Kuhn, *Textile Technology*, pp. 85, 430; Robert Cliver, "China", in Lex Heerma van Voss, Els Hiemstra-Kuperus, and Elise van Nederveen Meerkerk, eds., *The Ashgate companion to the history of textile workers, 1650-2000* (Ashgate Publishing, Ltd., 2010), pp. 103-139. Linda Cooke Johnson has indicated to me that the avoidance of sheep, wool and mutton was a

seems to have been made into clothing. In northern China coats padded with cotton served to protect against the cold. As for India, an early twentieth-century author noted: "Indian-grown wool is mostly of very poor quality, short-stapled and without felting qualities, so that it is only suitable for carding, and the manufacture of blankets, rugs, carpets, felts, and other coarse articles."[57] Much of the wool came from dead animals, which suggests that it was largely a byproduct of the rearing of sheep for meat. It should be added that the East India Company, under pressure from English producers, tried without much success to sell woollen cloth in India and China. Once its Indian monopoly was lost in 1813, it abandoned the trade.[58]

Wool is perhaps not the most interesting case, since sheep husbandry is a relatively land intensive activity. Higher population densities in the core areas of China and India probably made sheep rare, but that is also true of areas in Europe like the Low Countries and northern Italy. Sheep were common in the more sparsely populated areas of northern and western China and of northern India, but this source of wool did not sustain a significant textile industry.

A more interesting case is the use bast (i.e., woody) fibres, such as flax, hemp, ramie and jute, to make clothing. Growing and processing these fibres is a relatively labour-intensive activity typically carried out on small holdings.[59] It might be expected that they would figure prominently in Asian textile history, but they were little used for clothing. Although before the nineteenth century there is no mention of flax cultivation in China, hemp and ramie had been widely used since at least the Zhou period (1122-256 BC).[60] Hemp was used to make rope and cloth, particularly in north China. Ramie was used for finer cloth. The advent of cotton, from the thirteenth century, squeezed out the use of both these bast fibres, except in rope making and in the production of some coarse cloth.[61] In India jute and hemp had long been cultivated. There are the odd references to them being used by the poor to make clothing, but cotton predominated.[62]

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long-standing cultural norm in China. This would also explain the absence of prices and other information.

[57] Vera Anstey, *The Economic Development of India* (London, 1929), p. 282.

[58] H.V. Bowen, *The Business of Empire: The East India Company and Imperial Britain, 1756-1833* (Cambridge: Cambridge University Press, 2006), pp. 223-4, 234, 254.

[59] Some Japanese evidence suggests that peasants preferred cotton because it took less labour to cultivate and process (Masayuki Tanimoto, "Cotton and the peasant economy: a foreign fibre in early modern Japan", in Giorgio Riello and Prasannan Parthasarathi, eds., *The Spinning World: A Global History of Cotton Textiles* (Oxford: Oxford University Press, 2009), p. 369).

[60] Dieter Kuhn, *Science and Civilisation in China, volume 5, Chemistry and Chemical Technology, part IX, Textile Technology: Spinning and Reeling* (Cambridge, 1988), pp. 15-22, 56

[61] Kenneth Pomeranz, *The Great Divergence* (Princeton, 2000), pp. 96-7. Both hemp and ramie had also been used in Japan, and both were also squeezed out by cotton, though mainly in the eighteenth century, much later than in China (Masayuki Tanimoto, "Cotton and the peasant economy: a foreign fibre in early modern Japan", in Giorgio Riello and Prasannan Parthasarathi, eds., *The Spinning World: A Global History of Cotton Textiles* (Oxford: Oxford University Press, 2009), pp. 367-386: 369-372).

[62] William Wilson Hunter, *The Indian Empire: Its People, History and Products* (London, 1886), p. 576.

Cotton and the Great Divergence

The movement in Europe from an expensive cotton to a cheap cotton regime has some implications for the debate about divergence between Europe and Asia. One is purely technical and has to do with the measurement of differences in living standards during the eighteenth century. If Asians had the benefit of cheap cottons and Europeans had to make do with woollens and linens, then there is a potential index number problem. Taking cotton cloth as the standard consumption item, as Allen and his collaborators do in their subsistence bundle, will tend to bias real wage comparisons against Europe because of its relatively higher price in Europe. However, even if the price of cottons in Europe were two or three times that in China, it would not narrow the real wage gap between England and China very much, given that clothing expenditure accounts for only 7 per cent of the subsistence consumption bundle.[63] Their alternative method of pricing equal lengths of cloth, cotton in China and linen in Europe, eliminates this bias, but leaves open the question of whether the fabrics were equivalent in consumption. Cottons were light, easily washable and held dyes well, but linens were more durable. This last characteristic may be the more important when considering minimum subsistence (and if so, would also tend to bias real wage comparisons against Europe), but may count less for households with more to spend.

A more important implication has to do with the importance of extra-European resources to Europe's development. Pomeranz stresses the "ghost acres" available in the American South to supply Europe's cotton industry with raw materials. Since Pomeranz paid little attention to relative prices, for him a "ghost acre" was an acre and remained an acre.[64] But each acre planted with cotton in the mid-nineteenth century America was the equivalent of two or more acres in the late eighteenth century. Increased British demand for cotton encountered a society that, albeit heavily dependent on slave labour, was capable of significant innovation. New plant varieties were developed, adapted to particular localities, and rapidly adopted. Indigenous manufacturers produced more and more efficient machinery for ginning and packing cotton. There was probably also an organizational dimension to the triumph of American cotton in Europe, at least with respect ot Indian cotton. Indian producers and merchants had a long-standing difficulty in supplying a clean product. In the late eighteenth century the quantities of seeds, dirt and leaves to be found in bales of Indian cotton threatened a booming trade with China, and adulteration of cotton remained a problem well into the nineteenth century.[65]

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[63] Allen et al, "Wages, prices and living standards". Elsewhere Allen indicates that cotton prices may be three times higher in London than in Canton (Allen, "Mr Lockyer").

[64] Michael Edwards struck a similar note much earlier: "The single most important factor was the availability of land" (*The Growth of the British Cotton Trade, 1780-1815* (Manchester, Manchester University Press, 1967), p. 95).

[65] Pamela Nightingale, *Trade and Empire in Western India, 1784-1806* (Cambridge: Cambridge University Press, 1970), pp. 133-134, 143-144, 188; Frenise A. Logan, "India's Loss of the British Cotton Market after 1865", *Journal of Southern History*, 31, 1 (Feb 1965), 40-50: 41-43. In the early 1840s it was estimated that Indian cotton would be worth 25 per cent more if cleaned to the same degree as American cotton (L.R. Reid, "Cultivation of Cotton in India", *Manchester Guardian*, 4 Jan. 1842, p. 4, cols. 5-7).

Conclusion

The beginning of the nineteenth century marked a major turning point in the history of world textiles not only because of water frames, mules and power looms, but also because of new cotton varieties, saw gins and baling presses. Better land and better methods in the American South reversed the upward trend in the European price of cotton relative to other textile fibres that had characterized the eighteenth century. From the 1790s to the 1840s cotton's relative price fell by about 75 per cent, a change that would only be eroded modestly during the rest of the century. A cheaper raw material reinforced the mechanical advances that made cotton cloth, not woollen cloth or linen cloth, one of the archetypal products of the Industrial Revolution.

Cotton and cotton goods had been relatively expensive in Europe, so Europeans wore mainly woollens and linens up through the eighteenth century. When the relative prices of cotton and cottons fell dramatically from the late eighteenth century, Europeans increasing wore cotton shirts and dresses and used cotton sheets and towels. The linen industry was hurt worst and grew only modestly over the nineteenth century. The woollen and worsted industries did better, but nowhere near as well as the cotton industry.

In India and China cotton and cottons had long been relatively cheap and the changes in the nineteenth century only reinforced the existing predominance of cottons. Cheaper cotton and mechanization did make it possible for Europeans to sell cottons on the Asian market, though in both India and China domestic production remained important throughout the century.