

# **Quality, Cotton and the Global Luxury Trade**

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## **Introduction**

This paper is a very preliminary investigation into connections between the global luxury trade and the invention of quality consumer goods in eighteenth-century Europe, and especially Britain. I argue that a trade in Chinese and Indian export ware stimulated both product and process innovation in Europe. Quality was the key priority of the major textile inventions of the period, as it was for improvements in earthenware, glass and metal ornament. Asian export ware provided models of product-type and large-scale production; metropolitan market institutions for selling Asian luxuries also shaped markets for new British consumer goods. Cotton textiles, especially muslins and printed calicoes provide an example of a much more wide-spread process of a 'quality road to industrialization.'

## **The Quality road to Industrialization**

Two small books have pushed me in new directions to look once again at the sources of industrialization. I place these roots of industrialization in the demarcation of luxury from necessary goods and in the quality of products. J.R. Hicks's *A Theory of Economic History* (1969) pointed to the route from gifts and tribute to commodities and trade. A great king receives embassies bearing gifts; he sees among these gifts some which he would like more of. He sends an embassy in return with

his own gifts, and also specifies the type he would like in return. Thus it is that diplomacy and presents turn into international trade. Hicks appeals to two well-known Chinese examples: the treasure fleets from China, across the Indian Ocean and down the coast of Africa, led by Zheng He between 1405 and 1433 to exchange tribute; and the reception of the Qian-long Emperor in 1793 of the 'tribute' brought by the Macartney Embassy. Macartney's goods, like those of all European merchants who had come to the Chinese court over the eighteenth century, were only 'tribute' to confirm their subordinate status before the Emperor.

The characteristics of the gifts and the conventions of the customary economy in which they were offered defined the meanings of this tribute. There is an extensive anthropological literature on the 'gift' and tribute, but this literature and its concepts are entirely separated off from that on luxuries as a trade in commodities. (Mauss, 1990; Appadurai, 1986; Weiner, 1992; Gordon, 2003) I wish to raise the question of whether the political and ritual meaning attending 'tribute' should be so separated off from the characteristics we attach to luxury goods. Hicks thought of tribute not in terms of 'inalienable' possessions, removed from economic circulation, but as special luxury products whose value was enhanced by the long distance from which they had come, and by the intrinsic physical and aesthetic qualities of the objects. His model of the mercantile economy, based on the city state, shows trade that grows and diversifies. Gains accrue to some, though not all social groups as merchants access new commodities. These commodities and their qualities bring great gains from trade, but gains which the economist and quantitative economic historian cannot measure, and therefore rarely discuss:

'The variety of goods available is increased, with all the widening of life that that entails. This is a gain which 'quantitative economic history' which works with index-

numbers of real income, is ill-fitted to measure, or even to describe. (Hicks, 1969, pp. 30, 56)

If enhancing the variety of goods contributes to a 'widening of life', then the qualities and characteristics of these goods provide an appeal that generates demand, and in turn the framework for production. Thus John U. Nef's *The Cultural Foundations of Industrialization* (1958) set out the connections between consumer goods and industrialization. Nef posed that England responded in a particular way to earlier continental achievements. He argued that the goals of continental manufacture in the sixteenth and seventeenth centuries were sumptuousness, surprise and delight, at a time when what the English were known for was using pig iron and coal fuels. Just when the Dutch were developing new living styles with intimate spaces as settings for beautiful objects, the English pursued their advantages in coal, beer, lumber, iron, copper, brass and metal manufactures, building material and paper. But English manufacturers turned, he reasoned, to producing their own luxuries in the later seventeenth and eighteenth centuries. They used their own materials and technologies, and created an 'economy of quality', which led in turn to increased productivity and inventiveness. (Nef, 1958)

The new and various goods emerging from this 'economy of quality' responded to the luxury and craft products of her European neighbours, but more significantly they responded to a global commodity trade in Asian export ware. My paper will argue first that product innovation and quality improvement provided key sources of British industrialization in the eighteenth century. Second, it will argue that global trade, intensifying from the later seventeenth century, pressured merchants and consumers to bypass former limits on the world trade in luxury goods, to invent for quality, and even to refashion the meaning of quality. Cotton textiles are part of this story of the transformation of global luxury into a quality road to industrialization.

## **Quality, product innovation and product characteristics**

Histories of the industrial revolution have long provided intensive analysis of technological innovation, focussed on process innovation. They have devoted little discussion to quality and product characteristics, despite the priority given by contemporary merchants and manufacturers to their markets. We have, perhaps, focussed too narrowly on a technology that tells us of process innovation, but too little of the product innovation that went with this. Ian Wendt in his contribution for this conference, 'Writing the rich economic history of the South Asian textile industry' shows us just what we can achieve through close consideration of cloth dimensions, thread counts, cloth weight and cloth quality. These are, he argues, the keys to unlocking the labour that produced a textile. (Wendt, 2005) Carlo Poni, some years ago set out the wide socio-economic ramifications of silk technologies in sixteenth and eighteenth-century Italy that changed the counts of yarn and the quality of goods. (Poni, 1981; Poni, 1997) Products and qualities were likewise central to Britain's industrial revolution.

Product innovation brought in its wake productivity gains that we have not yet even tried to estimate. Economists recently have told us that estimates of productivity growth in the last half of the twentieth century are biased downwards because these do not adjust for quality improvements, nor do they count new products. These new products and improvements in the quality of existing ones do not show up in the output statistics by which productivity growth is measured, for such statistics are based on long runs of data for the same goods over time. Some have also noticed the bias this introduces against output growth for earlier periods. Cotton quality improvements and new varieties in the later eighteenth century and improvements in oil lamps in the late eighteenth century along with the introduction of gas lighting at the beginning of the nineteenth century are important examples. And Joel Mokyr has

indicated the part played by new services and especially new medical interventions, such as the discovery of smallpox inoculation in 1796. (Mokyr, 2004, v.1, p. 12) What economist would want to deny their significance to economic growth, but yet these are missed out of measures of economic growth between 1760 and 1830. (Bresnahan and Gordon, 1997), pp. 29-70; Mokyr, 2004, pp. 1-28, pp. 12-13)

Turning to the analysis of the physical properties of goods must take us to the economic theory of hedonic indices. Products are bundles of characteristics whose effects can be isolated through hedonic functions, that is to say, relations between prices of heterogeneous goods and the quantities of characteristics contained in them. Quality innovation implies positive demand responses to high-quality products, and willingness to pay for the higher production costs involved in making quality goods. (Lancaster, 1971, pp. 2-12). Behind the search for new and higher quality products lies an 'active' consumer' taking part in taste formation, responding to new goods, and combining and recombining goods to create a social identity. (Bianchi, 1998, pp.64-86) Making better products also frequently required supporting changes in processes; higher qualities or better substitutes could have the same effect as reductions in costs and prices. (Von Tunzelmann, 1995, pp. 12-13) Neil De Marchi has pursued the analysis of hedonic indices. Using the Wundt curve he shows that pleasure, measured by a hedonic index, rises as we are stimulated with more variety and colour, but this reaches a peak and declines if the sensation becomes too intense. Too much variety, too much brightness, and possessions that become reproducible, generate displeasure. The way to avoid this, he argues, is to move onto new product curves. He follows Mandeville's observation that we have a 'violent Fondness to change, and a greater Eagerness after Novelties.' Novelty has to be of the right sort, and can be contrived. Novelties from the East in the seventeenth century were curiosities; in the eighteenth

century men and women sought pleasure in 'deliberate artifice'. There was a 'growing delight in artifice'; they sought 'to emulate (and supplant) the foreigner's best inventions.' (De Marchi, 1999, pp. 391, 405)

Historians considering product innovation have, however, defined this narrowly as import substitution, or domestic replacements for foreign goods. Yet manufacturers at the time pursued patents and projects that show them experimenting and inventing new goods to be sold on world markets. Responding to the fine goods of the global luxury trade led British producers in new and creative directions. What they achieved in the process was not just an 'industrial revolution', but a 'product revolution' of equal significance. What David Hume praised as a 'refinement in home manufactures' or 'their own steel and iron' that became 'like the gold and rubies of the Indies' was what John Nef in our own century saw as a creation of an economy of quality out of 'their own materials and technologies.' The different goods British producers created were quality goods, and goods produced, moreover, by the division of labour and machine methods. If we follow De Marchi's point about the pleasure in artifice, we see that this is also a pleasure taken in invention and ingenuity. 'New-invented' was an advertising trope of the eighteenth century, and manufacturers sought to present an 'ingenious product' associated with scientific thinking. (De Marchi, 1999, pp. 405-6) Quality and ingenuity went together in the appeal of new goods.

Yet debates over the timing and speed of Britain's technological ascendancy do not acknowledge the association between technological development and the ascendancy of key manufactured products: these products were first and foremost textiles, they were other consumer goods, especially glassware, earthenware and metal goods, and they were machinery. The success of British technology was bound up with the success of its products - and that is how contemporaries saw it at the time. Mule spun yarn made for consistent fine cotton cloth, and copper

plate and cylinder-printed designs defined a new quality British cotton product. Huntsman crucible steel would produce the quality of English buckles; coining and minting machinery, along with presses and stamps provided the variety and quality of British buttons, medals and brass furniture ware. The cream ware body and transfer-printed designs defined the newly-desirable Staffordshire chinaware.

These British products were widely sought out in international markets especially in the period after the 1760s; during years of war they were smuggled in where possible, and after the end of the Napoleonic Wars, they did indeed swamp Europe. They did so, not because they were cheap, and Europe was a good dumping ground, but because they were better, they conveyed science and modernity, they were fashionable, and they were already recognizably branded. These identifiable British products did not just happen as an offshoot of machines and technological processes; producers attended to the quality, variety and novelty of their products as avidly as they did to how they were made.

Patents, projects and invention more generally focussed to a much higher degree than most historians have assumed on the quality and finishing. MacLeod identified an aim of 'improving the regularity of the product' as of equal significance to increasing output or saving time among patents for capital-saving inventions between 1660 and 1799. (MacLeod, p. 172). Patents for group of metalwares, glass, ceramics, furniture, clocks and watches and finishing techniques on a range of consumer goods over the period 1627-1825 yielded 1,610 patents, or 30 percent of patents taken out over the period. Printing on cloth claimed the highest number of patents taken out for ornamenting and finishing these goods. (Berg, 2002, p. 22) (See Table 1). O'Brien, Griffiths, and Hunt, in a separate investigation of 166 textile improvements, both patented and non-patented, over the period 1715 to 1800, identified 49.5 per cent as

aiming for product improvement or differentiation. (O'Brien et. al., 1996, p. 167). Improvements and inventions in finishing techniques over the period 1734-79 featured prominently alongside inventions for manufacturing and preparatory processes, and finishing improvement claimed proportionately more patents and inventions than manufacturing or preparation before 1753. (See Table 2)

Contemporaries saw themselves embarking on a national project to create quality consumer goods. They looked to the arts for the design and taste to make British goods that would substitute for luxury imports from Asia and the rest of Europe, and which would become exports in their own right. We need to discuss not only how the technology succeeded in Britain, but how a key group of products became desirable in international markets, indeed how they became globalized.

There is no doubt that mercantilist policies played their part in framing this approach to products. By the second quarter of the eighteenth century it was difficult to buy foreign manufactured imports without paying high tariffs, especially those from France. Some goods such as Indian cottons and French silks were entirely prohibited. During the eighteenth century French porcelain faced heavy duties in British markets: commercial importation was prohibited until 1775; from then until Eden's Commercial Treaty with France in 1786, it faced a duty of 150 per cent. Great efforts were made by the state, projectors, and entrepreneurs to promote and to start up these foreign forms of manufacture in England. It is difficult to ascribe intentions - were these simply to make English copies, which, in the hothouse climate of tariff walls, were bound ultimately to fail in a freer international economy? Or was it the practice, if not the intention, to manufacture and to establish new products successful enough to generate not just domestic markets, but their own international markets? The great effort put into art and design and into



sophisticated advertising; efforts to foster aristocratic patronage and to identify key goods with civility and modernity indicate a larger project.

This product revolution was not a domestic event, for it found its context in a global economy. It marked out a 'British pathway' to providing quality consumer goods for rapidly expanding middling-class markets at home and abroad. That pathway was, however, made in the framework of the models, institutions, markets and knowledge networks of the global luxury trade, and especially the trade with Asia.

### **Luxury Goods and World Trade**

Global trade is not usually considered to be the key stimulus to the industrial revolution, and even less so a global trade in luxury goods. Where we do consider trade, too often we look no further back than the seventeenth and eighteenth centuries. There we find evidence of a wider world trade that would sustain many of the features that we associate with industrialized communities: large scale production, standardized products, long distance trade. Christopher Bayly considers early long-distance trade as a form of 'archaic globalization' focussed on the rarefied collecting of charismatic goods and substances, or luxuries and honorific goods from distant lands, such as Kashmiri shawls, Chinese silks, Arab horses and precious stones. (Bayly, 2004, p. 42) But all those conditions of large-scale production focussed on long-distance trade prevailed in Bronze Age societies going back to the fourth millennium BC; they were significant and impacted fully on the wider society of the Roman Empire, then retreated for several hundred years. (Sherratt, 1995, pp. 1-32; Ward-Perkins, 2005) They marked out China's Sung Dynasty where ceramics were exported to Korea, Japan, South East Asia, India, Iraq and Africa. (Vainker, 1991; Vickers and Gill, 1996) A long pre-history of empires and societies engaged in advanced technologies, concentrated

production processes and standardized production serving large cities and long-distance trade, but this was followed by periods of collapse or at least decline.

The period of early modern trade following the voyages of discovery from the sixteenth century set in motion a new scale of production and exchange, which together fed the roots of industrialization in Europe. Intense investment in long-distance trade reflected rising incomes of certain social classes, and the part played by exotic, non-European and luxury goods in European consumer aspirations. These were the goods that changed diet, dress, the social customs and eating and drinking and domestic interiors; they thus had a wide impact on all social classes. Chinese porcelain and Indian cottons together underpinned new consumption rituals, sociability and fashion markets. The exotic provenance of both, emanating from an Indian Ocean trade then associated by Europeans with mystique and danger, excited fascination; a sense of unknowable technologies, of secret processes, and enhanced value.

But at the same time these goods were part of a commodities trade; they were not items of art whose value was created by withdrawing them from circulation. They entered European markets in rapidly ascending quantities as European trade networks with Asia intensified. Merchants were aware of vast production complexes in the case of porcelain, and of seemingly infinite dense networks of highly skilled textile communities in the case of cottons. These production sites replicated and standardized goods; they provided variety in design and quality; they made the higher quality items that might be consumed among the lower ranks to indicate their higher incomes or status. But above all else, these particular goods, porcelain and cotton, *reflected* more expensive objects and materials. Porcelain that reflected silver and jade was a more accessible luxury good; in Europe fine earthenware that reflected

porcelain was a quality consumer good. Likewise with cotton. It may be that some of the ceremonial silk khil'at cloth, given as 'robes of honour' and tribute by Mughal princes, carefully graded by quality and design for rank and occasion, reflected in its textures, silver and gold threads the precious and intricate arts of Mughal miniature paintings. Certainly such tribute giving of cloth was depicted in the miniatures. (Gordon, 2003, pp. 38-9; Eaton, 2004, p. 819). It was not such a far step for calico printers and painters to adapt the design and flower motifs of Decanni miniatures to their own manufactures. (Irwin and Brett, 1970, p. 9). Fine-quality fabrics, reflecting art, ceremony and tribute might also stimulate their own reflections in Europe.

East India Company merchants trading in Asian export ware actively participated in creating a product, dictating design sources, colour combinations, lengths and breadths of fabric, and shapes of porcelain ware. They also carefully cultivated their markets in Europe, and set them firmly within metropolitan luxury markets, relying on the auction houses, galleries, gold and silversmiths, toyshops, marchands-merciers, mercers and chinasellers to sell directly to consumers and to other retailers. The East India Companies which originally brought in exotic collectables seized an opportunity to develop luxury and semi-luxury markets for the textiles and the porcelain they brought. They sought out chintz printed on fine cloth to establish a fashion good, then diversified to a broader range of qualities. They adapted the porcelain they brought to new gentry and middle-class desirables in tea ware and dinner services. The move from an art object or exotic collectable to a commodity of taste and fashion was one step. The next was accessing such goods, recreated as 'export ware' for Europe. East India Companies and local merchants discovered vast production complexes and networks in China and India, already highly integrated into world trade, redirecting some of their focus to European markets, and seeking control over access to other

markets. The high-volume production of export ware in Asia, combined with sales in Europe as luxury ware provided the model for European and especially British consumer goods production. Competing with Asian export ware required production and retailing of *quality* goods. This imperative shaped the part played by cotton in the industrial revolution.

### **Cotton and the Industrial Revolution**

Cotton is the great industry of global history. The narrative of its transfer from East to West is simultaneously the grand narrative of modernization and industrialization in Britain, in most other European countries and in North America. Parthasarathi ascribes to cotton along with iron the key manufacturing industries of the great divergence. Europe, before the later eighteenth century produced cotton textiles at a considerable disadvantage. The challenge to meet Indian superiority in cotton manufacture and trade fostered the fundamental changes that led into industrialization. (Parthasarathi, 2002, p. 286)

The reason cotton has featured so prominently was technology. This was the 'central industry' of the industrial revolution. It was the most dynamic industry of Britain between 1760 and 1800; it grew from a small and marginal industry to by far and away the major manufacturing industry, providing 2.6% of value added in 1770, and 22.4% in 1831. (Crafts, 1985, p.22) This industry, summed up by Mokyr, was the site of mechanisation, concentration and increasing productivity. It was paradigmatic of the industrial revolution as a whole. (Mokyr, 2004, pp. 18,22). Mokyr asserts that 'technology was at the core of everything'; (Mokyr, 2003, v.3, p. 50), and the cotton textile industry was one of the four leading sites of new technology during the 'years of miracles', with others, including energy utilisation, material and 'miscellaneous'. (Mokyr, 1981,v.1, p. 18).

Generations of historians have sought to explain this path of technological change. Why cotton? A string of 'brilliant mechanical inventions' between 1765-1779 - Kay's flying shuttle, Hargreave's jenny, Arkwright's water frame, Crompton's mule, were reinforced by chlorine bleaching in 1774 and roller printing in 1785. Most attributed such a unique concentration of innovation to cotton's physical characteristics. Unlike other textiles, this product, as Mokyr sums up the consensus 'lent itself uniquely to mechanization and mass production'; and the output of both new technology and work organization was a product of 'even quality, attractive, and above all inexpensive'(Mokyr, 2003, v.3, p.51). We know, therefore, that mechanisation worked in this industry, yet it had not been applied before in what we know was a major Asian industry from the medieval period, and one with extensive global markets. The reasons advanced for such innovation focus above all on labour-saving. David Landes saw machines substituting for human skill and effort. The advantages of mechanisation, from Edward Baines's history of the cotton manufacture in 1835 onwards, were always presented as the number of hours needed to spin a hundred pounds of cotton 'The old technology employed an Indian handspinner; who took about 50,000 hours. The mule brought that number down to around 300 hours in the 1790s, and three decades later the self-actor reduced the figure to 135'. (Mokyr, 2003, v.3, p. 51) Even more recent global historians focus on labour-saving: Parsathasathi appeals to efforts to save on wages and labour discipline in response to the challenge of India. British textile producers innovated, including adopting the factory system due to their 'need to outproduce India'. (Parthasarathi, 2002, p.293).

Labour-saving mechanisation followed by challenge-response explanations of succeeding innovation do not, however, explain underlying causes or contemporary perceptions of motivations to innovation. Von Tunzelmann many years ago pointed out that there was

little incentive in terms of input prices, over the whole period of innovation, to substitute capital for labour. Over most of the period real wages did not rise substantially, but there were two periods of sharp wage increases in the north - the 1750s and 1760s and at the end of the eighteenth century, coinciding with the French and Napoleonic Wars. These may have prompted efforts to mechanise, but at this stage we have only coincidence rather than evidence to establish this. (Von Tunzelmann , 1993, p. 256). Indeed Crompton's mule was not invented with the objective of replacing labour, but rather of extending it. Crompton designed the mules to be adopted in workers' cottages. (VonTunzelmann, 1995, p.110)

The part played by the cotton industry in explaining the industrial revolution is connected above all to productivity change; that change in the eighteenth century has been placed almost exclusively on labour-saving innovation whatever the reservations on motivations. As argued above, economic historians focus on process innovation; they treat product and quality innovation separately, as an aspect of demand. Their focus on process innovation yields a significant place for cotton in the growth of final output; but even so, their results, ignoring product and quality differences, may well have underestimated productivity change in the industry. Crafts and Harley's estimates of cotton output are built on evidence using low-level counts of yarn, and a basic multiplier on raw cotton inputs for their final output series. (Harley and Crafts, 1995, p.141). Their estimates have never acknowledged the force of challenges claiming a much greater part played in quality differences, in improvements in quality, and in changing mixes of fabrics in exported cotton good. (Cuenca Estaban, 1994, p. 78; Cuenca Estaban, 1995, p. 148).

Only recently are historians turning to the product yielded by this crucial industry. What counts of yarn were produced; what types of

fabrics were made; did quality improve; did questions of product, quality and output drive mechanisation? Thus Griffiths, Hunt and O'Brien, studying the chronology of textile invention, turn to the part played by output quality and to acknowledging the rapidly changing market for fashionable textiles. They tell us that Robert Kay listed quality consideration highly among the benefits to accrue from the use of his father's shuttle. Advocates of machine spinning made much of improvements in quality that would result, and the prospects these offered of entry into lucrative quality-end international markets in North America, Africa and Europe. (O'Brien, et.al, 2005, pp. 18, 24). Von Tunzelmann recognized that the advantages of the cotton mule were greatest in fine yarns; innovations like the mule allowed higher qualities to be produced by machine methods. But Von Tunzelmann regarded the mule as the exception that proved the rule. He argued that mechanisation more generally took place first in lower grade products, and with learning could come to be applied to higher-grade output. Mechanisation was still, in this account, about standardization and lower and median quality output. (Von Tunzelmann, 1995, p. 132). Yet a significant part of the story of mechanisation also claimed by Mokyr was about producing cheaper, better and more versatile products.

The cotton industry in Britain mechanised and grew in response to the incentives offered by world import and export markets in cotton textiles, and the real challenge was producing quality and variety. This was a story of product innovation fundamentally integrated into process innovation.

## **Quality, Innovation and the Cotton Trade**

### Cotton and Luxury Goods

Histories of the Industrial Revolution centre on the cotton industry, but cotton textiles have rarely featured in these histories as luxury or quality goods. Cotton textiles appear in these histories as a new sector emerging in the later eighteenth century to compete with the woollen and linen industries. Histories of the industrial revolution also place cotton textiles at the centre of the transition to the factory system. The factory, we are told, organized less skilled labour together with systems of division of labour and mechanization that succeeded first in low quality or basic goods for wide markets, while higher quality goods continued to be produced in the hand craft sector. (Landes, 1969, Marglin, 1974, Von Tunzelmann, 1993). Recent research on calico printing questions this.

This section of my paper argues against our preconceptions on the sources of technological and organizational change during the Industrial Revolution. The market for varieties of cotton goods and especially high quality cottons played a key role in fostering innovation in the industry, both in technology and in organization, including the factory system. Cotton needs to be considered within the wider framework of global luxury goods, traded by East India Companies, focussed initially on a London entrepot trade. Its regional growth in Lancashire responded to international markets, and especially to the import trade in luxury Indian cotton goods. Its formation as an industry was of a piece with other quality British consumer goods honed to compete in highly developed markets for oriental luxury goods. Fine earthenware was sold in the same marketing framework as Chinese porcelain, and faced the same exacting consumer standards for quality and price. Innovative fine metalwares and japanned goods, likewise, faced such markets. Was cotton different - its success made in mechanisation, standardization, factories and mass popular markets? This is what the conventional



histories convey to us. But I argue here that it was one of those quality consumer goods, developed in response to oriental luxury. Quality provided the incentive to mechanisation as well as factory organization.

From its early formation as an English industry, cotton or fustians (cotton, linen mixes) responded to the variety, price differences, and invention which marked out Asian imports from porcelain to silks, muslins and calicoes. Holker, reporting on the Lancashire fustian industry, found 67 different cotton/linen fabrics. Manufacturers from an early stage recognized consumer preferences for variety and quality. (Thirsk, 1978, p. 107; Lemire, 2003, p. 506). Cotton was an exotic fibre imported from the Levant, then from the West Indies and Brazil through London. The metropolitan base also dictated the diffusion of imported luxury fabrics, including cotton goods, throughout British home markets. The market for imported cotton goods focussed on fashion goods, novelty and quality wares. The cotton goods developed in England also responded to similar markets. Manufacturers sought out quality raw cotton imports; they focussed on finishing processes, and they concentrated their efforts to innovate in the intermediate stages of weaving and spinning at the high end of the market.

In developing this argument, I will turn first to imports of Indian cottons, especially calicoes and the legislation directed to control these. The calico craze in Europe from the mid 17<sup>th</sup> Century brought a luxury good, fine cotton calico fabrics, dyed and printed in colourful designs into wide fashion markets; such fashion markets were previously much more restricted and supplied with much more expensive silks, and fine figured woollens and linens.

Merchants fostered the high-end market for this fabric, made on its visual and tactile characteristics, but more significantly, its exotic provenance from Asia. The value of cottons imported in the 1660s exceeded that of Chinese silks. Indian calicoes by the end of the

seventeenth century accounted for one quarter of all textiles imported into England. (O'Brien et.al., 1991, p. 396).

Beverly Lemire and John Styles set out the entry of Indian calicoes into British markets in the seventeenth century first as curiosities and exotics, and subsequently as fashionable luxury goods. Styles recounts a limited entry early in the century as quilts and hangings displayed as curiosities. But shortly afterwards the company directors sought to develop a market for the materials as domestic furnishings and fine table and bed linens. It was not until the 1640s that the East India Company took charge of directing print designs to appeal to English taste. By the 1660s it was sending sample patterns for Indian printers to adapt. By the 1660s they were developing markets for the cloth within the same framework as the annual fashion change developed by the Lyons silk manufacturers.(Styles, 2000, pp. 133-5). Lemire presents a fabric imported within British controlled-trade to challenge the French domination of fashion markets. As Lord Halifax put it, 'we might look the more like a distinct People, and not be under the Servility of Imitation.' (cited in Lemire, 1991, p. 11) . Lemire and Styles recount the directed campaign of Sir Josiah Child and Company officials to foster the taste for the fabric among the wealthy and fashionable. In Lemire's words 'Excellence in manufacture and originality of design concerned the east India Company above all else.' (Lemire, 1991, p. 15) Indian printed fabrics provided the quality and variety amenable to rapidly-changing fashion markets. Cargoes soon brought in an extensive assortment of fabrics suited to every ornament and use, and priced so to suit. (Lemire,1991., p. 18).

What Lemire and Styles recount here is the active construction of the 'Calico Craze' by merchants, and the focus on quality fashion markets to do so. Merchants did not treat their fabric as a cheap substitute for expensive European silks and fine French or Flemish linens or 'Hollands'.

Such efforts as there were to do so failed, as in the example cited by Styles of attempts to substitute cheap Indian ready-made shifts and shirts for their fine European linen originals. (Styles, 2000, pp. 136-7). They succeeded where they joined cotton to pre-existing luxury textile markets, developing new fashions for their use, rather than exploiting a cheap alternative to existing wear and use. Thus we see the development of new interior decoration, the use of palampores or quilts, hangings and curtains, as well as new types of dress from banyans and waistcoats to cuffs, neckcloths, handkerchiefs, headdresses and pockets, overdresses, aprons and petticoats.

As markets developed for a new luxury fabric, so state policy engaged with another luxury import, and attempts to develop domestic production of the fabric also faced the challenges of secret, artisan technologies difficult to replicate or transfer.

### State Policy

O'Brien has argued for a clear mercantilist direction of state policy towards the cotton industry from the later seventeenth century to the later eighteenth century. No ad hoc compilation of enactments responding to petition and counter petition of conflicting textile interests, the cotton legislation was in all but name an industrial development programme whose great success proved the general case for free trade. Cotton holds an iconic status in British industrial growth; it was the industry that proved Ricardo's theory of comparative advantage, and in so doing made the Industrial Revolution. But as O'Brien argues, it was created as an industry behind a programme of tariff barriers and import bans.

O'Brien argues that Parliament allowed Asian textiles the time, that is four to five decades, to demonstrate the potential demand for cotton cloth. It then reserved the home market, not so much for woollens and silks, as for linens and fustians by encouraging the dyeing and printing of

textiles. Legislation then enacted between 1736 and 1774 helped to transform her fustian industry into a mechanised cotton industry. O'Brien refers to this as a 'benign legislative framework' for the long-term development of the cotton industry. (O'Brien, 1991, p. 418).

Legislation shaping the industry started in 1696-7 with the prohibition of imports of wrought silk from Europe; perceived increases in demand for Chinese silk and Indian calicoes generated agitation against Asian imports. In 1701 all imported wrought silks as well as printed and dyed calicoes were banned. Plain calicoes were still allowed in, and could be finished and sold at home; Indian muslins were also allowed free access. In 1721 virtually all cotton textiles were banned; home-produced linens and fustians or linen-cotton mixes were allowed, and expected to take up the demand for printed, flowered and checked fabric. (O'Brien, et.al, 1991, pp. 403-7). The Manchester Act of 1735 clarified the Act of 1721, excluding from the prohibition all printed goods made of linen yarn and cotton wool, and manufactured in Britain. Pure cotton goods were still prohibited, but cotton-linen mixtures were accepted as 'a branch of the ancient fustian manufacture of this kingdom.' (Cited in Daniels, 1920, p. 24). Prohibitions on cotton goods then remained in force until the repeal of the Act in 1774. Throughout the first three quarters of the eighteenth century, O'Brien argues, the production of fabrics partly made from cotton flourished behind a protective wall; legislation furthermore directed production to mixed cotton and linen yarns, with much of the linen yarn imported first from Ireland, then from Scotland. State initiative thus fostered not just the growth of an English regional manufacture, but that of Ireland and Scotland; their economic improvement was part of the package for their political integration. (O'Brien et.al., 'Political Origins', 2005, pp. 5-13).

Early Indian cotton imports were quality fashion goods. The legislation that fostered a domestic cotton industry in the first instance

improved a fustian and linen industry. The products of this industry developed in competition in international markets with Indian cottons, and though markets at home were protected, fashion conscious consumers sought the quality and variety they identified with Indian calicoes and muslins. Both product and process innovation were, from the start, directed to markets for high quality, high taste goods. British fustians and later cottons developed within the framework set by Asian luxury-goods production.

### Technology and Quality

Asian technologies were long perceived in Europe as labour and skill-intensive, impenetrable, exotic and secret. European commentators described hereditary spinning and weaving technologies producing specialised yarns and fabrics specialised by district. 'The rigid, clumsy fingers of a European would scarcely be able to make a piece of canvass, with instruments which are all that an Indian employs in making a piece of cambric.' (Cited in Chaudhuri, 1990, p. 298). They admired, but failed to replicate the 'fine, bright and durable colours' of Indian dyes, which they attributed to 'the water.' (Postlethwayt, 1757, v.1, 'Callicoe'). They witnessed families of low-caste Hindus working together, even including their children to produce prints of incomparable beauty: drawing the outlines on the cloth and applying the mordant were 'done by little children as well as older, they... run over them [the cloths] with a dexterity and exactness peculiar to themselves.' (Irwin and Brett, 1970, p. 8.) And Europeans marvelled at muslins described as 'linens' 'of such fineness, that very long and broad pieces of it may easily be drawn through a small ring.' (Postlethwayt, 1757, v.1, 'Mechanical Arts').

Technologies developed at home faced enormous challenges to compete at home and abroad against the backdrop of these highly-regarded Asian techniques. Spinning and printing innovation over the

course of the eighteenth century prioritised quality goods. The point of spinning innovations over the eighteenth century was to reduce yarn shortages and to enhance the quality and variety of yarn. Better yarn also enhanced the quality and variety of handloom cloth. (Rose, 1996, pp. 8.9) Flexible outwork and volatile fashion markets for fine cloth dictated production and demand for handloom cloth and printed goods.

The first determinant of quality was the raw cotton itself. Recent economic indicators of the growth of cotton output in Britain over the eighteenth and early nineteenth century are based on data on raw cotton imports and excise duties. But there was no single type of cotton imported; it came from many parts of the world and in a whole range of qualities. Prices ranged from 12 3/4 d a pound to 23 1/2 d. a pound in the mid 1770s for cotton taken from Smyrna on the one hand and Surinam on the other. In the late 1780s imports were divided between the French, Spanish, Dutch and Portuguese colonies and the East Indies on the one hand, and the Levant on the other. (Fitton and Wadsworth, 1958, pp. 262-4)

Projects and patents for spinning innovations from at least the 1690s sought a quality output to compete with Indian yarn: 'to be spun so extraordinarily fine, as to be fit to make such cloths commonly called calicoes...as well as in the East Indies'; or invention to make 'calicoes, muslins and other fine cloths...to as great perfection as those which are brought over and imported hither from Calicut and other places in the East Indies.' (Daniels, 1920,, p. 17) Arkwright, defending his 'patent machines' in 1774, and campaigning for an end to the additional excise duty of 3d on calicoes, argued that his cotton warps were both cheaper and of higher quality; his patent cotton warp 'could answer as well as linen warp for many goods'. (Daniels, 1920, p. 91). And Crompton's mule from 1779 made it possible for Lancashire's manufacturers to compete with India in 'the finer branches'. Manufacturers at the time saw the

opportunities opened by Crompton's technological improvement. It made it possible for Samuel Oldknow to envisage a manufacture of 'Balasore' handkerchiefs, of jaconet and of japanned muslins'. The first histories of the cotton manufacture focussed on new yarn qualities produced by machine which now made possible effective competition with India.

The 1812 Committee on Crompton's petition claimed that 'in the invention of the mule may be found one of the chief causes of the transference of the seat of an industry to the Western from the Eastern world, where it had been situated from time immemorial.' (Daniels, p. 129) Kennedy's *Brief Memoir of Samuel Crompton* stated that Samuel Oldknow 'took new ground by copying some of the fabrics imported from India, which at that time supplied this kingdom with all the finer fabrics, and which the mule-spun yarn alone could imitate.' (Daniels, 1920, p. 131)

The Scots extended the manufacture of fine yarns. In Lanarkshire they were 'long in the habit of weaving fine cambric from flax yarn, and silk friezes, [and] had also turned their hands to the manufacture of fine cotton fabrics principally from the fine yarns produced by Hargreaves' and other subsequent machines.' In Nottinghamshire, fine cotton yarn also transformed the lace manufacture. 'Twofold fine cotton twisted together was found to answer very well as a substitute [for fine linen]; and as it required the finest yarns, a great impulse was given towards perfecting the production of fine cotton yarn.' (Daniels, 1920, p. 131).

The mule was known as Muslin Wheel. Crompton described it as 'that piece of mechanism that has produced and increased one of the first manufactories in Europe, viz, the fine Muslin and Cambric.' (Unwin, 1924, p. 3). Muslin was the generic name given at the time to the finest cotton goods made from counts between 50 and 70. It was manufactured in all varieties and patterns, and especially in imitation of India goods, which

were also given Indian names. Earlier efforts to succeed at muslin had failed to meet the test of Indian competition. Oldknow employed his weavers to use the yarn first on fabrics they were used to making such as cords and velveteens, but by 1782 had started a muslin manufacture. His markets, furthermore, were London-based. London's fashion trade looking for the 'latest novelties in Manchester goods' 'found a gold-mine in Oldknow's muslins.' His products competed directly with the India product, and faced a 'severe burst of competition' whenever East India Company vessels unloaded cargoes of textiles. (Unwin, 1924, p. 7)

Oldknow flung himself into metropolitan fashion markets, facing the challenge on quality and finishing of his Indian competitors. He wrote to one of his London merchants in 1783,

'If I could be certain of the Muslin trade continuing with us here I shd. not require a moment to determine what to do. The prospect is at present very propitious (but at a time when East India Muslins are exceeding scarce and in all probability will not long continue so - it may not be) but how will it be when East India Muslins are more plentiful.....fine spinning what we are most short of & even that we are on the road to procure. The finishing part is what we have long been striving to master and in this I wish you to say what you think of mine. I do them myself and the people I employ in that department are under an obligation not to disclose the secret...I take very great delight in the manufacture and shall always be anxious to excel.' (Unwin, 1924, p. 11)

By 1784, Oldknow had over 1000 weavers working for him, and his entire output supplied fashion markets for muslins and calicoes. His London merchants demanded frequent changes in design:



‘Vary the spot Barleycorns, leaves, and other little fancy objects, in short an infinite variety may yet be made; we do not despair of great attainments in this branch of trade. Ingenuity and patience and perseverance will yet work miracles.’...

‘The Blue and White checks [calico] are quite a drag, indeed this trade is beneath your notice, ingenuity is not wanted...Nothing but new things will please fashionable women, try your invention once more.’ (Cited in Unwin, 1924, p.45)

Oldknow’s London merchants pressured him throughout 1786 to make high quality, new fashion muslins. ..(For all the following passages see Unwin, 1942, pp. 60-67)

‘turn your Weavers to Muslins. [To] forward this Manufacture we now enclose you some patterns drawn [from] Different articles of Muslins, come over as presents to the People of Fashion.’ (March 15, 1786)

‘-‘We wish you to quit the low Ballasore hkfs, they will not answer...we must be content, if we rise Superior in fine Goods. press forward in all the finer Articles & as fast as possible.....We want as many Spotted Muslins & fancy Muslins as you can make the finer the better... You must give a look to Invention, Industry you have in abundance. ..’(April 4, 1786)

‘The Muslins & Sattinetts came by the Coach this morning. We rather wish you to drop the Sattinetts, they are not new here & only fit for 2 months Sale. The Buff Stripes are liked best but

still do not pursue it, turn the Loom to something Else. They are not fine enough for people of Fashion, for which they are only calculated for...' (May 10, 1786)

'Do not make any Shawls, they are totally unsaleable...The Striped muslin Cravats are too coarse & thick, drop them entirely. Fancy broad Stripes are the fashion & good Quality from 42/-to 60/-...The Scotch has sent up many Spotted Muslins, indeed too good & too cheap - You must make them thinner & raise the Spot. Different sizes of Spots, Barley corns, little Clubs, and any other[ ] Figure will vary & give more choice - they answer for Cloaks as well as aprons & gowns...' (June 5, 1786)

These demanding merchants prepared a history of the rise and progress of the British muslin and calico manufacture for the Lords of the Council for Trade, claiming that 'the object they [the inventors] grasped was great indeed - to establish a Manufacture in Britain that should rival in some measure the Fabrics of Bengall. This was treated by many persons who had great knowledge in Bengall piece Goods as a very wide & chimerical scheme—but it hath not turned out so Three years experience hath more than justified their most sanguine hopes of Success in the Callico & Muslin articles.' (Unwin, 1924, p. 63)

The muslin and calico manufacturers fashioned their goods in direct competition with Indian cottons. They attended the India Muslin sales in London to see the style and quality of the goods coming in, to watch how they sold, and to take away new ideas for patterns and higher quality, 'there are more India Goods coming into the Market than has been known of these many years in so short a time.' (Salte to Oldknow) May 23, 1786; Oct. 18, 1787, Unwin, 1924, pp. 67, 96)

‘there is no Trade...Nobody will buy till the India Sale is over...the Jamdannies we must very much improve in fineness & in taste in patterns...Many other Makers are sending finer things to market than we make which is rather against us...We must make finer goods & we ...must not make more but rather fewer than we now do - for it is almost incredible the quantity that will come into the Market of India Muslins the next 4 months.....The private Trade sale began today and very fine thin goods sold high - so that very fine thin goods we must make our aim... (Salte to Oldknow, Oct. 19, 1787, Unwin, p. 96).

By the Spring of 1789 muslins grew to make up nine-tenths of Oldknow’s production and even more of his sales. Substantial amounts of these high-quality goods were furthermore figured, and they were highly differentiated. (Unwin, pp. 103-5)

Lancashire’s manufacturers pitted themselves against the Indian challenge in pursuing an output of high quality figured muslins. It was India which also set the terms for producing printed calicoes. Chapman and Chassagne argue, against accepted conventions, that British *and* French production of printed calicoes addressed high-fashion markets, quality goods based in craft-based skills. For a fashion industry, such as calico printing, they argue, consumer demand shifted rapidly, and it was the firms that could respond quickly that did well. With fashion demand for printed calicoes high across Europe and North America, the big challenge for printers was to compete with oriental qualities and prices. As Chapman and Chassagne put it, the ‘essence of Lancashire’s problem was that in India ‘millions of ingenious and industrious manufacturers...work for one-fifth part of the wages given in England’, and moreover the East India Company had successfully geared their Indian labour force to the demands of the European market. (Chapman and Chassagne, 1981, pp. 198,200; cf. Chassagne, 2003, pp. 513-527).

Yet Indian imports were not always of the quality and design demanded, nor could they be depended on. Parthasarathi found Indian merchants in the first half of the eighteenth century facing great difficulties in enforcing quality standards on weavers in South India. The advance contract system used by merchants allowed weavers to select their yarns, to mix good and poor yarn, to conceal defective cloth in sophisticated schemes of embezzlement. They were in a buyer's market; there were always private traders able to give high prices. With the enforcement of European calico acts, prices stagnated for a time. Various parts of India over the whole period between 1744 and 1763 faced war, conflict and insecurities from the Maharatta War to the break-up of the Mughal Empire. The East India Company complained of high prices and bad quality on goods coming through Bombay, Madras and Bengal. Rapidly-expanding European demand and the relaxation of import controls on plain and printed cotton goods in France in 1759 and in Britain in 1774 exacerbated pressures; prices rose and quality deteriorated. More European and private traders were keen buyers of even poorly manufactured pieces. Quality control now dictated moves by the East India Company to tighten their hold on markets for cloth in their territories and to exert more control over weavers, the yarn they spun and the looms they worked. (Wadsworth and Mann, 1931, pp. 163-4; Parthasarathi, 1998, pp. 79-91)

Following the cases of Robert Peel in Lancashire and Oberkampf in Mulhouse between the 1770s and 1790s, Chapman and Chassagne describe a heady atmosphere of fashion markets, the 'calico rage'. The real problem for the printers was matching the perceived high quality of Indian imports while extending their markets out to the middling classes.

Aikin, in his *Description of the Country from Thirty to Forty Miles around Manchester* (1795), described Peel's works as a high-class producer:

‘The articles here made and printed are chiefly the finest kind of the cotton manufactory and they are in high request both in Manchester and London. The printing is performed in the most approved methods, both by wooden blocks and copper rollers, and the execution and colours are some of the very best of the Lancashire fabric...Ingenious artists are employed in drawing patterns and cutting and engraving them on wood and copper, and many women and children in mixing and pencilling the colours,etc..’.(cited in Chapman and Chassagne, 1981, p. 58).

Peel’s objectives extended beyond the quality of the finishing and printing of fabrics to the cloth itself: he perfected his own production of quality fabrics, seeing out and adopting Crompton’s mule for fine spinning as soon as it appeared. He experimented constantly and trained schools of mechanics and artisans. He now competed with London printers using Indian fabrics. The American Quaker merchant, Samuel Rowland Fisher, on his travels around Britain’s manufacturing centres in 1783 commented on Peel’s success:

‘Very large quantities are made in the Neighbourhood of Bolton & Blackburn, their prints are done at Bury & they appear to me to be the best manufacture, well printed and the cheapest I have ever seen. They have and will command all the trade which used to be carried on near London.’ (Chapman and Chassagne, 1981, p. 44)

Rowland Fisher’s optimistic assessments notwithstanding, the metropolitan printers still led fashion and luxury markets, and their products still needed Indian fabrics. According to a London draper, ‘the prepossessions’ of the ‘higher wearers’ was still against muslins of British manufacture despite their high standard. (Chapman and Chassagne, 1981, p. 79). And Lancashire manufacturers, even in 1792 when they

petitioned Pitt over renewal of the East India Company charter, knew that they still faced the fierce competition of hand-painted Indian textiles, hand-made muslins, calicoes, nankeens and other Oriental specialities. They pressed for total prohibition of sales of Indian textiles in the British home market, for an increase of raw cotton supplies from the Orient and for direct access to the Indian market. But they failed against the interests of London wholesale dealers in Indian piece goods who claimed that the pinnacle of London society still preferred genuine oriental prints. (Chapman and Chassagne, 1981, p. 92; India Office Records A/2/11; India Office Records: A/1/85a).

In contrast to Peel, Oberkampf in Mulhouse did not even try to match the production of Indian fabrics. He concentrated on printing, and imported his fabrics. He dealt in London in the 1770s for his Indian cloth, and in Lorient in the 1790s when prices were much lower than those on the London markets. He always preferred Indian woven fabrics until forced by the Napoleonic prohibitions on their import to demand higher standards from local producers in Normandy and Picardy. (Chapman and Chassagne, 1981, pp. 157, 159, 195). Oberkampf focussed on quality, and built a fashion market for his own distinctive designs. He introduced copper plate printing as early as 1769, by the 1770s he set about 'the creation of a new taste' and by the early 1780s was using the best-known designer of the day, J.B. Huet to produce topical designs for high-fashion markets. In doing this, he made his printing works at Jouy a celebrity; his products were brands even by the 1770s, so that 'in a small village where you would not believe that anyone would have a notion about it, the salesman would be given the price he asked as soon as he showed the trademark' (Chapman and Chassagne, 1981, pp. 133, 150).

Again, copper plate printing, aimed at the high end of the market, was a superior art form not a labour-saving device. It was an East India Company merchant who first bought the process in the late 1750s to

introduce into his print works in Surrey; the process spread quickly along the networks of the international luxury trade, so that Oberkampf was using it by 1769. The process allowed large scale prints on fabric: 'decorated with elegant pictorial designs with figures, landscapes and architecture, often incorporating mythological, romantic, theatrical or commemorative scenes of a type completely beyond the scope of the humbler wood block printer.' (Chapman and Chassagne, 1981, p. 18) The crossover of print designs from engravings to wallpaper and textiles, and later through transfer printing onto ceramics and janned ware (Scott, 2000, pp. 1-21; Clayton, 1997) was not so very different than the art transfers of Mughal India between Persian miniature painting and kalik cloth.

High-quality goods directed at fashion markets, and indeed sold as new art works made the name, but Peel and Oberkampf knew that the advantage of Indian calicoes and muslins lay in quality and price. Creating a distinctive luxury product only took them part of the way; their businesses were only to be sustained by opening out to middling and even labouring-class markets. East India Company merchants were already adept at demarcating their consumers. A Nantes calico printer admired the success of the Dutch East India Company that specialized in bringing in fabrics for the common people, while the English brought in those for 'more refined taste'. (Chapman and Chassagne, p. 18) Oberkampf, like Oldknow, spent long periods each year at the East India Company sales in London or Lorient, studying the varieties of cloth, and buying up all the plain types he could get. And he printed this to suit his different markets. He produced a little less than half his output in copper plate pieces for the luxury and fashion market, and more than half in wood block pieces for the popular market. The Peels chose a similar market division, but also soon realized the potential in pursuing variety and novelty in prints on their own cottons for fashion-conscious popular

markets. Peel, like other Lancashire printers, did not hire designers, but pirated the latest designs from London. Rapid turnover, and warehouse selling of the new designs several times a week wrested the initiative from the London printers and East India Company merchants. (Chapman and Chassagne, 1981, pp. 133, 85)

The story that has come down to us is one of decline in quality and design. By the 1780s the British had been eclipsed by the French. (Kusamitsu, 1981, pp. 77-95) Francois de Rochefoucauld said of the Manchester manufacturers: 'their dyes are not very high quality and they do not finish them on cotton any better than we do, there are some which lose their colour by exposure to the air.' F.A. Wenderborn, travelling to Lancashire in 1790 reported: 'It is said that the English manufacturers, particularly those who employ themselves in articles of luxury, do it with less taste than some other nations, particularly their neighbours the French.. They show this want of taste much in their drawings, their designs and patterns...' (Chapman and Chassagne, 1981, p. 88).

Their comments echoed the more widespread British debate on design and quality at the time. Whether there had actually been a decline is a moot point. Chapman has argued elsewhere for the ascendancy of London and Dublin in designing, engraving and colouring printed textiles in the third quarter of the eighteenth century; English pattern books at the time demonstrated the quality of floral and pictorial designs. (Chapman, *The Cotton Industry*, 1987, p.57). Certainly, the debate itself as well as the conscious competition with London printers, with the French and with India generated reflection on just what distinguished the Lancashire product from others. Peel, praised in the 1760s for his 'precision, exactness and order' saw his firm's essential advantage in its capacity to produce a wide variety of designs, and to respond immediately to changing orders and wider markets. (Chapman and Chassagne, 1981, p. 214). That responsiveness was especially important in international



markets. Long runs and simple designs, along with rapid responses to the take up of new varieties meant productivity and quality, more important in these markets than factories and mechanisation.

The import markets that fuelled fashion in the first instance now turned to export markets. The Lancashire producers could provide demanding North American and West Indian merchants with the quality, novelty and competitive prices they demanded. Output quality was what mattered in this high-income Atlantic free-trade zone. Inventors and advocates of spinning machinery attested to the improved export ware they could produce. Mechanisation would provide merchants with the more varied and higher quality product mix they sought. Irish, Scots and even Indian hand-made goods now looked unreliable, and even possibly second-best. (O'Brien, 2005, p. 24). Peel sold directly to these merchants, and wrote of the number calling at his warehouse, always looking for better quality. By 1790 the British were producing 15 or 16 million yards of coloured piece goods; a large proportion went to North American and European markets.). At the height of the Napoleonic Wars, buyers at the embargoed Frankfurt fairs wanted muslins and printed calicoes *sur les dessins et modèles venus de Londres*, though to be sure, they were often produced by Swiss or Alsation manufacturers.(Chapman and Chassagne, 1981, pp. 81, 87, 93) As Chapman concluded his small book on the Cotton Industry, 'In this period British textile producers were out to win the world market for both cheap mass-produced *and* quality fabrics, and to a remarkable degree they succeeded.' (Chapman, 1987, p. 61)

## **Conclusion**

The rise of the British cotton industry and its central place in the industrial revolution was based in the global trade in luxury goods. This

luxury goods trade generated the search for quality consumer goods; the quality of products dominated the priorities of manufacturers and inventors. The Asian trade in export ware provided models of production and distribution and the institutions for making markets for cottons as well as other quality consumer goods. The challenge posed by India was not its cheap labour, but the quality of its products.

Table 1

*Patents for New Products, Ornamenting and Finishing, U.K., 1627-1825*

Buckles and fastenings	36
Cutlery: knives, forks, razors, sword cutlery	27
Glass, ivory and bone	4
Drawing and photography: exhibiting prints and painted scenery	16
Earthenware and porcelain: glazing, painting, gilding, Printing and ornamenting	8
Embossing, gilding, damasking	15
Engraving, etching and chasing	12
Making and ornamenting frames for pictures and looking glasses	7
Workboxes, music stands, dressing boxes and firescreens	4
Castors, knobs and handles	10
Cabinet and other furniture	14
Furniture:	
Tables	17
Chairs, sofas and similar articles	8
Bedsteads and couches	16
Metals and metallic substances:	
Plating, tinning, lining, covering	35
Ornamenting, inlaying and polishing	9
Moulding and ornaments for buildings, coaches and furniture	18
Papier mâché and japanned ware	5
Painting, paints and varnishes	56
Pearl, ivory and bone	3
Printing on cloth	67
Printing and stamping paper	19

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**Source:** Patents selected on core consumer industries (30% of total patents taken out over period 1627-1825) from Bennet Woodcroft (1857), *Subject Matter Index of Patents of Invention from March 2, 16178 to October 1, 1852*, London: Patent Office. London: Patent Office; Public Record Office 2/210, Petty Bag Office, *Specification and Surrender Rolls*; and Public Record Office d/79, *Calendar of Specification Rolls*.

Table 2

*The Pattern of Textile Innovation, 1734-79 (%)*

<u>All Traceable Inventions</u>	<u>Preparatory</u>	<u>Manufacturing</u>	<u>Finishing</u>	<u>Not Known</u>
1734-53	22.7	35.4	38.2	3.7
1760-79	29.1	37.3	33.6	
<u>Patented Inventions</u>				
1734-53	20.4	20.4	51.8	7.4
1760-79	21.7	44	34.2	

**Source:** O'Brien, P.K., Griffiths, T., and Hunt, P., 'The Political Origins of Technological Change: The Hanoverian State, the Celtic Fringe and the British Industrial Revolution', [unpublished paper, 2005], p.3.