OCCASIONAL PAPER NO. 117

The Decline of India's Cotton Handicrafts: 1800-1905
A Quantitative Macro-Study

Amalendu Guha

December 1989

Centre for Studies in Social Sciences, Calcutta
10, Lake Terrace
Calcutta - 700029.

PREFACE

This is a revised version of the paper I presented at the Workshop on The Economic and Social History of Colonial India held at the Jawaharlal Nehru University, New Delhi, in March 1989. It is a contribution to the ongoing debate regarding the decline of India's cotton handicrafts during the nineteenth century. However, the paper limits itself to a macro-level quantitative analysis and is not concerned in general, with the inter-regional variations within India in the experiences of spinners and weavers. Our quantitative excrcises confirm an over-all decline of the industry during the period under review. Handloom production and employment went on declining, even though per capita cloth consumption showed, at the same time, a rising trend.

Amalendu Guha

Centre for Studies in Social Sciences, Calcutta
24 August 1989.

Historical Background

Until the English industrial revolution, the Indian cotton textile industry remained "the foremost in the world, both in the quality and quantity of its output and the scale of its exports". [Braudel: 1985, p.509]. It met not only the entire domestic, but also an extensive foreign demand in fine and course piecegoods. The English East India Company alone exported in the peak year of 1727 over a million pieces, valued £ 0.56 million or Rs.4.5 million at the then accounting rate of Rs.8 to the pound [Chaudhuri : 1978, pp.541-8]. About this time, all the European Companies together "perhaps annually exported some thirty million yards of fine and coarse textiles" [Chaudhuri : CEHI, 1983, pp.842, 842n]. How much of India's foreign trade in cloth was handled by the private traders at this juncture is however beyond anybody's computation. Of the famous Dacca cloth trade, worth about Arcot Rs.2.85 million, some one-half to two-thirds were reportedly sent to the foreign markets and of this, about 52 to 62 per cent, by private traders [Taylor : 1851, pp.130-1]. If this ratio could be applied also to India's cloth export trade as a whole, then K.N. Chaudhuri's partial estimate of thirty million yards might be raised well up to the range of 62 to 79 million yards.

That India's piecegoods exports were rising towards the end of the eighteenth century is beyond dispute [Sinha : 1965, p.18]. What the English East India Company exported from

Bengal alone in 1793 was more than what it exported from the whole of India in 1727. In the Madras Presidency, the Company's annual investment in piecegoods amounted to Rs.4.6 to Rs.5.6 milliom about 1770 and Rs.1.2 million in 1796. [Raju : 1941, p.164]. Even the latter amount exceeded the corresponding amount exported from Madras in 1727 [Chaudhuri : 1978, p.543]. Private foreign trade, for which data are available since 1795, was also growing. For example, Bengal's piecegoods exports increased from Rs.9.5 million in 1795/6 to Rs.12 million in 1799/1800 and to an average Rs.15.3 million annually in the quinquennium 1800/1 - 1804/5 [Chaudhuri : CEHI, 1983, p.821]. According to a recent estimate, India was perhaps annually exporting over four million pieces, worth £ 2.4 million (= Rs.24 million) during the 1790s [Twomey: 1983, pp.41, Table 3]. M.J. Twomey further suggests that in terms of yardage, all this represented fifty million yards or so of cotton cloth [Twomey : 1983, p.40]. As against his value figure, his yardage figure however appears to be on the lower side, involving a possible underestimation.

This high level of cloth exports could hardly be sustained for long. There followed, hence, a lingering decline also in production. In Section One, the story of this decline will be analytically brought up to the end of the 1860s. In Section Two, the situation prevailing during 1870/1 - 1904/5 will be described and analysed. Then will follow our concluding Section and quantitative exercises appended to it. Out central objective throughout will be to quantify, as far as possible, the decline of the production and employment in our cotton handcrafts sector. Besides, the impact thereof on our cloth consumption will also be noted. But before all that, we must first explain the peculiar complexities of the aforesaid late eighteenth century growth in cloth exports.

By 1788 a viable cotton textile industry had developed in Great Britain on the basis of imported raw cotton and yarn as well as newly invented cost-reducing machinery. Circumstances would have made this development halting and slovenly had there not been present also built-in hot house conditions in the form of the Tariff Acts of 1700 and 1720. These Acts between them, continued to totally shut out the main classes of Indian piece-goods from the British market, while raising a protective wall of high duties against the rest until their repeal in 1825. In 1814, for example, the consolidated ad valorem import duties on calicoes and muslins meant for the UK consumers were, respectively, even more than 68 and 31 per cent, while the use of imported coloured goods continued to be prohibited [Sinha : 1970, p.11; Parshad : 1932, pp.82-5, 93-6]. It was therefore mostly for reexportation that the U.K. imported Indian piecegoods.

In 1788, eightyfive per cent of imported calicoes and sixty per cent of imported muslins were reexported by the UK. Being an input for the British industry, Indian yarn was however a welcome import item, initially. But as soon as the technical problem of locally producing yarn of a tolerable strength also for the warp was solved, yarn imports into the UK began to be frowned upon. The Company ceased to buy Indian yarn, although its finest variety still retained its competitive advantage. The market for Indian cotton goods in the Uk remained small, Yet continued pressure was put on the Company by various interests for further cuts in its imports, even if meant for reexportation. We find among the Manchester Memorialists praying for more stringent protection at this stage men like Sir Richard Arkwright and Robert Peel [Ellision : 1969, p.62]. There was a clamour

throughout the 1780s and the early 1790s against /any likely sending-out of textile machinery, equipments and experts to India. In fact, by 1793 British manufacturers had already started invading the European market to oust the Company's reexports /Ibid; Sinha : 1927, pp.173 and 145-50; Tripathi : 1979, pp.24-5; Furber : 1970, pp.290-301/. They were /also demanding that the Indian market be opened up for British industrial goods and India be developed as a supplier of raw materials Britain needed.

It was clear to everybody by then that Indian handicrafts had no future, unless their tools were improved. Yet the Company could hardly initiate such improvements, for fear of antagonising British manufacturing interests. In 1787, John Bebb from Dacca enquired of the Court of Directors if Arkwright's Spinning Jenny could be introduced in India. /Sinha : 1965, pp.28-9/. But, to introduce Italian silk winding methods and Chinese silkworm to improve sericulture in India, or experimenting with raw cotton improvement programmes, was one thing; and to send cost-reducing machines to give competitive edge to Indian piecegoods was quite another. For the Company, it was equally difficult to shift overnight from manufactures to raw materials as the major means of remittance from India. Given the British ethos and politics of economic nationalism of the times, the Company therefore preferred to tighten the slacks in piecegoods procurement rather than encouraging changes in production methods, to push up exports. It intensified the exploitation of weavers, virtually reducing them to an indentured status /Sinha : 1970, pp.3-4; Raju : 1941, pp.172-3/. At the same time, it also adopted a series of measures to boost such raw material exports as opium, indigo and raw cotton.

The story of the weavers being coerced and squeezed in the Company's aurangs in pursuance of the first objective until 1813 has been well-documented [e.g., Sinha : 1965, pp.157-81, Hossain : 1988, pp.108-39.7. The late eighteenth century growth in cloth exports was therefore very much a forced one.

The nineteenth century opened with a new economic situation, best told in the words of a contemporary :

> "..... numerous and extensive cloth manufactories have been recently established in the interior of France; and there as well as in England, the weavers have succeeded in imitating with so much exactness the fabrics of Bengal (particularly our coarse and middling assortments of muslins) that there is every reason to believe our trade in muslins in this description, whether for home or foreign markets must inevitably dwindle to nothing.
>
> ..... the exports of piecegoods on the public account have also very considerably decreased..., the consequences are that the weavers finding no employment for their looms, many of them have been necessitated to quit their homes and seek employment elsewhere; most of them take to the plough and remain in their own districts, while others migrate into distant parts of the country." - Extracts from Larkins, Report on Bengal Commerce for 1804-5, dated 10 June 1806, p.237 [H.C. Vol.8, No.171: 1812/3, p.20_7.

Larkins further noted that a man would "earn more by his loom than by his plough".

I

Early Oscillations in Textile Exports

The end of the Company's monopoly trade under its new Charter of 1813 and the conclusion of the Napoleanic Wars in 1815

helped stimulate a transitory export boom. For several years India's cloth exports went on increasing once more, while imports of cotton goods, though also increasing, still remained insignificant. But after 1823 the situation moved fast to/her turn her into a net importer of cotton piecegoods and yarn by 1830. Not only was her foreign market soon almost totally lost, her home market too was under an invasion. Opium, indigo, raw cotton and raw silk - and not piecegoods - dominated henceforth the commodity composition of her export trade.

Let us have a quick look into what still remained of her once extensive foreign market in textiles. From about Sicca Rs.10 million in 1811/2, then accounting for one-third of her total exports, Bengals's piecegoods exports came down within two decades to a bare Sicca Rs.0.8 million in 1832/3, and even this small amount was according to C.E. Trevelyan, woven with English twist [Sinha 1970, p.42]. Private shipments of cotton piecegoods by sea from the Presidency of Madras to the rest of India and abroad in contrast, went on increasing until about 1836/7. Despite the Company's complete withdrawal from the India trade meanwhile, such shipments however began to decline thereafter, until their value came down by 1850/1 almost to the 1811/2 level [Raju : 1941, pp.302 and 310]. The destination-wise breakdown of the relevant official data, made available by A.S. Raju for select years since 1825/6, suggests a steady decline in the relevant shipments to the foreign markets as follows :

Year	1825/6	1830/1	1835/6	1840/1	1845/6	1850/1
Rs(m.)	5.6	3.7	4.9	3.6	2.6	1.7
Index	100	66	87	64	46	30

[Raju : 1941, p.303. Processed.]

The Madras data further show that, between 1825/6 and 1850/1, cloth exports to the Gulf and Red Sea Areas had come down to one-tenth and that to the UK to less than one-fifth of what it was. Besides, the piecegoods exports to Continental Europe had also almost disappeared by 1830/1; and to the Americas, by 1840/1 [Ibid_7.

The magnitude of the decline in cloth exports can be best grasped at the macro-level. During the twelve years ending 1839/40 India's overall piecegoods exports came down almost to half, from Rs.12.2 million to Rs.6.4 million; while the corresponding imports increased 55 per cent, from Rs.11.8 million to Rs.18.3 million. As a result, the percentage share of piecegoods in merchandise exports went down from 11 to 5 per cent and in merchandise imports, it went up from 22 to 32 per cent [Chaudhuri: 1983, Tables 10.10 and 10.17, pp.842-57_7. Thus by 1840 the ouster of Indian cotton goods from the world market was almost complete. Their share in merchandise exports further came down by 1860/1 to a bare 2.4 percent, and their share in the merchandise imports increased to about 40 per cent [H.C. Vol.72, No.C3817 : 1867, pp.46-7, 52-3_7.

After 1816 the trade in Indian piecegoods was faced a crisis in the USA, because of the latter's new protective tariffs as high as 60 to 70 per cent on all coarse piecegoods. On 29 March 1841, Henry Lee of USA wrote to his Madras agent that all cotton goods, blue as well as white, were "utterly without demand superseded by cheaper imitations" of USA and British make. While Americansthus stopped buying Indian, their own "unbleached drillings, made of best New Orleans cotton, were profitably selling

in Bengal at 4 to 4½ annas a yard. Three-yard pieces of this coarse sort, having a standard width of thirty inches, weighed a pound each [Porter : 1937, I pp.40, 120 and II 1451-3_7. That the term 'markin' (American) is still current in Bengali language to denote unbleached millmade cloth of the coarsest sort remains a testimony to the lingering impact it once made in the Bengal market. In 1840, G.G. de H. Larpent, Chairman the East India and China Association, observed that this imported sort was "very strong and lasting" and had come "much into use among the boatmen". He warned that "through inland navigation" it was threatening "to destroy the Indian market for even the coarsest fabrics and go to unbleached muslins" [H.C. Vol8, No.527 : 1840, p.168_7. Both good English shirtings and unbleached American drillings, according to him, sold at half the prices of similar articles of Indian make.

The American competition was, of course, transitory and was felt only in areas easily accessible from the ports of Calcutta and Madras, and that too on a limited scale as available import data suggest. But the British competition had come to stay and was acute. It increasingly pushed out India's piecegoods not only from her traditional foreign and best markets, but also from a good part of her own home market by the 1830s. The progressive dismantling of the Company's commercial establishments during 1813-33 was directly associated with this development. As a result of all this, there was a simultaneous general decline in cloth and yarn production in most parts of India, but first and most heavily in the Bengal Presidency.

Increasing Competition from Imports

Of course, the ruination of the finest Dacca textiles by 1813 was not so much due to competition as to the collapse of the old Indian aristocracy and the French Court. But the Bengal trade in fine, middling and even coarse quality fabrics languished mainly because of both British competition and unfair colonial tariffs. Dacca, Patna, Maldah, Murshidabad, Birbhum and Santipur - and also Tanda, Azamgarh and Mow — everywhere there was decline. The extent of employment in the Dacca city and its environs, excluding the distant aurangs, Larpent believed, consequently dropped down by 1840 from its earlier peak level of two lakh hands to less than ten thousand [H.C. Vol.8, No.527 : 1840, p.108]. Even if exaggerated, this belief had a basis. The population of the weaving town of Santipur also declined from fifty thousand in 1822 to less than twelve thousand/by 1851 [Sinha : 1970, p.9n].

Like weaving, spinning too faced a crisis. Regular yarn exports had almost disappeared by then. Yarn imports on the other hand, rose from Rs.4.2 million in 1828/29, according to Chaudhuri's corrected Series, to Rs.5.1 million in 1830/1, Rs.7.5 million in 1839/40, Rs.11.3 million in 1850/1 and to Rs.20.5 million by 1860/1 [Chaudhuri : CEHI, 1983, pp.857-60]. However limited, this increasing availability of imported machinespun yarn did help India's piecegoods exports to hold on, in value terms, to their last ditch position during the 1850s even as her corresponding piecegoods imports were rising fast (see Table 1). Progressive abolition of various internal duties on raw cotton, yarn, dyes and cloth in course of the years, 1836 to 1848, was one more factor that obviously helped in this

respect. All this is evident from the export data as presented in our Tables 1 and 2.

Did our cotton piecegoods exports behave the same way also in terms of yardage ? We have no data. According to Twomey's estimates (he does not say how he calculates) such exports per annum declined from 50 million to 30 million yards between 1800 and 1830 and to 20 million yards by about 1860 [Twomey : 1983, p.40]. Since the year 1828/9 was a break-even point for India's piecegoods imports and exports in value terms, the exported yardage of 1830 was expected not to lag far behind what was imported. Yet some lag must have been there, presumably because of the likely higher unit cost of Indian cloth. Altogether 59 million yards of British cloth were shipped in that year to India mainly, and to other places east of the Cape of Good Hope excluding China, nominally [Desai : 1971, Table 1, pp.346-8]. Hence, in the context of the above figure, Twomey's working estimate for 1830s appears sensible and so does that for 1860 as well.

Prior to the deepening of the crisis, India's cotton textile industry presented every gradation of weavers ranging from independent producer employing his own capital to weavers entirely dependent on advances. Some weavers were affluent enough to advance working capital to their poor bretheren or even employ them. Thomas Munro in 1804 observed that the better class of weavers in the Ceded Districts of Madras could earn as much as Rs.60 per month per loom while the lowest income was rupees eight [Raju : 1941, pp.167,170]. Even divested of possible exaggeration, these stray figures are telling. Weavers' plight

was worse in Bengal. Yet in 1799, even there a Company's weaver at Haripal could look forward to earning rupees four a month from his loom if only left alone to work independently for the market [Sinha : 1970, p.10]. This was certainly more than what a ploughmen earned, as will be shown below. The early nineteenth century decline of the industry totally changed this scenario.

This decline, both absolute and relative, cannot be wished away simply because it is not quantifiable in exact terms. There is ample qualitative evidence to show that while the industry's organised part underwent massive dislocation, the incomes of textile workers, including those who had changed over to other occupations, became depressed. Worst of all, those better-off weavers who once directly supplied the market and had potentiality of emerging as petty capitalists in an opportune milieu were finished. It is significant in this context that the 1857 proclamation of the rebel Maulavi of Azamgarh against the colonial regime made a direct reference to the weavers' plight [Bayly : 1983, pp.301, 365].

Steady Decline of Domestic Production.

British sellers' penetration into India's cloth market, though still limited in quantitative terms in the early 1830s, was far and wide. D. Mc. Intyre observed that already by 1821 British cotton textiles had appeared in the Upper Provinces of Bengal both via Bombay and Calcutta [H.C. : Vol.6, No.746, 1821, pp.294-301; also Bayly : 1983, p.291]. According to C.E. Trevelyan, even in Central India "in the

cavalcades of native chiefs ..... almost every other man appears in a tunic of English chintz" [H.C. Vol.8, No.527 : 1840, p.108]. While travelling through Ranjit Singh's territories and dependencies in the 1830s, Mohanlal Kashmiri found English piecegoods on sale in the markets of Amritsar, Multan, Derah Ghazi Khan, Shikarpur and Bahawalpur. He suggested that English atlas which sold at Delhi at two rupees a metre could easily beat the dariyai of Derah Ghazi Khan selling there at three rupees a metre, though it was inferior in quality. He also observed that at Bhahwalpur, coarse cotton cloth of local make sold at a price from four to fourteen metres to a rupee [Gupta : 1987, pp.38-42, 48 and 58].

C.A. Bayly argues that the sharp decline since 1835 in the trade of fine piecegoods from Agra, Benaras and Mirzapur was mainly due to a fall in the demand from the fallen Maratha aristocracy [Bayly : 1983, pp.268-9, 291]. This might be so, but what about the declining eastward cloth trade of the Upper and Western Provinces ? The percentage share of cotton textiles in the total value of the consignments sent towards Calcutta from the interior including the aforesaid region steadily decreased from 24 per cent in 1820 to four per cent in 1830 and then to a bare one per cent by 1836 [Kessinger : CEHI, 1983, Table 3.4, p.253]. In absolute terms, this meant a decrease from Rs.12.9 million in 1820 to Rs.2.1 million in 1830 and then to Rs.0.5 million by 1836. This massive decline cannot be explained in terms of displacements by cheap foreign goods or the decay of the old aristocracy alone. The oppressive system of transit duties in operation also contributed to it in a big way.

N.K. Sinha's estimate of about a million persons being thrown out of their textile jobs in the Bengal Presidency during 1793-1828 - he included cotton growers also among the affected - is hardly an over-statement /Sinha : 1970, pp.7-8/ in view of the aforesaid depressing factors. Most displaced men turned to the plough. There is evidence that an average hired ploughman, together with his wife, used to earn in cash and kind hardly rupees two per month in Purnea in 1809/10 /Buchanan : 1928, pp.443-4/ and Rs.1-14 annas in Azimabad Pargana (near Patna) in 1811/12 /Buchanan : n.d., pp.557-8/. It was then such low earnings that most of the displaced weavers had to look forward to, for a bare survival. Others became beggars, mendicants and criminals, or they faced starvation deaths /Gupta : 1984, pp.167, 278; Ghosal : 1966, pp.32-3/. In the Madras Presidency too displaced weavers generally turned to agriculture, while some emigrated abroad as indentured coolies. Before his return to Europe in 1823, J.A. Dubois observed that misery and desolation were widespread and that thousands of weavers suffered starvation deaths in several districts of the Presidency /Dubois : 1897, p.95/. The context of his observation was no famine, but a normal situation. William Bentinck's oft-quoted remarks of 30 May 1829 about "the bleaching bones of weavers" should not therefore be narrowly interpreted as limited to Bengal alone.

The facts presented by D. Kumar and V.D. Divekar with respective regard to southern and western India, also support our general contention.

By 1850

> "the unit value of output certainly declined sharply in many districts and probably also the incomes of certain classes of weavers. Valuable skills were lost ....., many weavers had emigrated or taker to agriculture; .... there were no longer many independent and substantial men among them. The south Indian dye industry.....may also have suffered'. [Kumar : CEHI, 1983, p.370].

Yet Kumar is not very sure of a fall in the textile employment during the period 1800 to 1857. "Indeed it may even have risen", she argues, due to an increased demand for cloth following 'increase' in population and agricultural output. Besides, "as a result of missionary activity, Indians wore more cloth" ! [Kumar : CEHI, 1983, p.369]. In western India Thatta, Nasarpur, Sehwan, Kerur, Broach and a host of other weaving centres decayed due to 'extensive use' of foreign cloth by Indians, this leading to "a fall in the prices of indigenous cloth" and hence also to "a fall in the wages of hired weavers". Hence Divekar concludes that those weavers who did not change over to English yarn "suffered from the twin disasters of unemployment and lower incomes". [Divekar : CEHI, 1983, pp.347-8]. The scope of such a change-over was however yet extremely limited since the supply of English yarn was still meagre.

Loss of women's earnings from spinning, carding and embroidering and men's from carding, weaving, bleaching and dyeing was indeed a big blow to both the rural and urban economies of India. In the depressed conditions of the early 19th-century Indian economy, no counterveiling development was

yet there in agriculture or elsewhere that could have absorbed the displaced at their former levels of living. This was as much true of Bengal as of other Presidencies. A recent study or the Madras Presidency concludes that weavers there in general became impoverished during 1820-70, despite an increase in the member of looms on record meanwhile [Specker : 1989, pp. 145, 165]. Another on the United Provinces concludes that, despite rising per capita national income, the handloom industry there had declined during 1860-1914 [Derbyshire : 1987, pp.522, 542].

Twomey concedes both the decline of handlooms and weavers' impoverishment. But in glaring contrast to Sinha's one million figure, his comparable estimate of the loss of fulltime textile jobs for Bengal is only 244.000; and for India as a whole, three lakhs. He takes into consideration the shrinkage of only the 'export related', but not also the internal market-related employment, although unemployment was caused no less by the oppressive internal tariff policy [Trevelyan : 1835, p.6; Sinha : 1970, pp.41-8]. Moreover, he ignores the effects on employment of the oppressive practices of the Company and European private traders [Raju : 1941, pp.172-3; Sinha : 1970, p.3; Sinha : 1965, pp.179-80]. Heavy transit duties and coercion, between them, affected production not only for the foreign but also the home market. "Manufactures do not flourish", as R.C. Dutt put it, "when manufacturers are held under any sort of thraldom" [Dutt : 1970, I-p. 182]. Under the circumstances, Twomey's textile unemployment estimates for both Bengal and India are gross underestimates.

Discriminatory Fiscal Policies

What harmed India's handlooms most during 1813-30 was not the comparative cost advantages of British piecegoods so much as their political advantages. The British industry had by then drastically reduced spinning costs, but not yet weaving costs to that extent. It was still overwhelmingly dominated by manually operated flyshuttle looms; and weavers' wages were high and on the rise. In 1815 there were two lakh handloom weavers in Great Britain as against five to seven thousand powerloom operatives [Ellison : 1968, p.66]. A Glasgow export firm's records show that well until 1854, it used to sell handloom cloth, partly produced by its own warehouse weavers and partly procured from independent handloom masters who controlled five to ten looms each [Slaven : 1969, p.498]. Their flyshuttle looms, no doubt, had a higher productivity Indian throw-shuttle looms; but labour was much cheaper in India. Hence, despite the rising ideology of free trade, Britain continued to use tariff policies as an instrument to forcibly turn India into UK's protected product market and retain it as such, until her relative cost advantages were firmly established. Since in current debates this aspect remains neglected, some elaboration of it is presented below. However, given our space constraint, we shall illustrate this point with some stray facts only, rather than tracing the tariff history in details.

While Indian piecegoods paid ad valorem duties from 27 to 71 per cent in 1812, 37 to 67 per cent in 1824 and 10 to 20 per cent in the 1830s at UK ports, British cottons paid only a nominal 2½ per cent and woollens no duty at all at Indian

ports [Dutt : 1970, I - pp.80, 280]. In colonial Ceylon British piecegoods paid a 5 per cent and Indian piecegoods 10 to 20 per cent import duties. In Australian colonies, according to J.C. Melvil's evidence of 9 March 1840, all British goods except spirits were duty-free, while goods from British India were subjected to a 10 per cent duty [H.C. Vol.9, No.527 : 1840, p.40].

At Indian ports, all non-British foreign ships had to pay export duties generally at double the rate paid by British ships. Even as late as 1852, British textiles paid a 5 per cent import duty there while other foreign ships paid 10 per cent [Dutt : 1970, II - p.113]. On entry into Calcutta by sea, Madras piecegoods were charged a 5 per cent duty, whereas British piecegoods paid just half this rate under the relevant Regulations of 1817. From 1811 onward the colonial policy was one of barring non-British foreign ships from participation in India's coastal trade, thereby ensuring a virtual British shipping monopoly there [Borpujari : Sept. 1973, pp.221, 231-2]. Again, until the promulgation of Act VI of 1844, Madras raw cotton if exported to the UK was duty-free, but not so if exported to China [H.C. Vol.9, No.511 : 1848, pp.478-9]. Similarly until the notification of 31 December 1847, while raw cotton exports to the UK had to pay no export duty, those to China had to pay a duty of half a rupee per maund [Guha : 1972, p.11]. This discrimination aimed at diverting the cotton trade away from China towards the UK with a view to helping Lancashire.

The British Navigation Acts which were in force until 1849, on the other hand, precluded Indian ships from sailing

west of the Cape of Good Hope unless manned by British crew. India-registered ships were thus prohibited from carrying goods to UK or Europe or even to the African west coast. Whoever violated this prohibition was penalised heavily so that he dared not repeat his feat a second time. This happened in the case of merchant Campbell around 1805 [Steven : 1965, pp.122-6, 144]. Hormusji Bhimji Patel and Thomas Crawford in 1835 [H.C. Vol.8, No.527 : 1840, pp.485-6, 611] and Jamshedji Jijibhai [H.C. Vol.9, No.511 : 1848, p.47]. R.W. Crawford had also the same experience in 1847, as we know from his own evidence of 3 March 1848 [Ibid].

What proved even more ruinous for Indian textiles than all such discrimination was the British-Indian system of internal land customs (transit duties), to which brief references have already been made. The transit duties were in force in Bengal till 1836, in Bombay till 1838 and in Madras at least until 1840. However, it was not before 1848 that British India's market as a whole was freed from all kinds of such barriers [Borpujari: Sept. 1973, pp.220-1]. While reviewing the system's functioning since 1793, Trevelyan found it to be more oppressive and inconvenient than the previous native system. Under the latter, transit duties were of the nature of tolls, he wrote, being "very light and simple, fixed upon well-understood quantities as an ox or camel load" and also proportionate to the distance travelled. But its British adaptation in 1810 with a view to turning India into a captive market for British goods led to "a frightful augmentation of duty" [Trevelyan : 1835, pp.2-6].

> "Cotton pays five per cent in its raw state; when made up into yarn, it pays 7½ per cent; when manufactured into piecegoods, 2½ per cent more; and if it happens to be dyed after a rowannah has been taken out for it as white cloth, it becomes liable to another charge of 2½ per cent; being 17½ per cent in all" /Ibid./.

This cumulative burden by itself was enough to cut at the very roots of the organised part of the Indian textile industry, dependent as it was for its excellence on a spatial division of labour across the customs cordons, for raw cotton and yarn supplies; and in some cases, also for special dyeing and bleaching processes. On the top of it there were other burdens which we have discussed. All this suggests that the British tariff policies at home and abroad were orchestrated to make India's textile industry non-viable with a view to forcibly vacating her market so that British cotton goods could enter. Piecegoods imports were not just additions to the local supplies, but their substitution to a considerable extent.

Free countries had a different story to tell. A vigorous policy of protection since 1815 helped the USA's cotton cloth output to expand from 840,000 yards in 1816 to 231 million yards by 1833. By that time Russia's protected cotton textile industry also struck its first roots. But in colonial India the opposite happened. Lacking protection and saddled with the obnoxious burdens, the first British private venture to start a composite cotton mill there at Calcutta during 1818-36 failed soon after commencing production. Its looms had to be laid off, and later also its spindles, which

had for some years produced annually some 0.7 million pounds of yarn in the range of 20s to 50s, even with Indian cotton [H.C. Vol.8, No.527 : 1840, pp.116-34_7. With internal duties gone and ownership changed more than once, this mill again started producing but never thrived. Western India's dozen newly started cotton mills - their 338,000 spindles consumed about 26 million pounds of raw cotton in 1861 - also were not out of their teething problem yet [Watt : 1890, IV - p.158_7.

Estimating Quantum of Decline in Production

Let us now come back to the question of quantifying the decline in handloom production between 1830 and 1860. British piecegoods exports to East India increased from 59 million yards in 1830 to 825 million yards in 1860. That is, in between, as much as 766 million yards were added to East India's intake of British cloth. If we could assume population and per capita income to be static for the period, we could have perhaps couclusively said that a decline to the extent of 766 million yards had taken place in the Indian production, and then could have proceeded to calculate the loss in terms of employment. But, however marginally, the population did probably increase. As to the feasibility of any increase in per capita income over the period, we have no evidence. Available national income estimates are all confined to the post-1850 period.

During the years 1830 to 1860 the annual supply of machinespun yarn remained still marginal. It increased from an initial four million pounds of foreign-spun to some thirty million pounds of foreign and less than twenty million pounds

of Indian machinespun yarn. All this would have added, at the most, 240 million yards or so th the 825 million yards of imported cloth, thus bringing up the total mill-made yardage to 1065 million in 1960. But at nine yards per capita, the cloth consumption of her 245.2 million population [Morris : 1974, pp.309-12_7 in that year must have been about 2207 million yards. Of this 1142 (i.e., 2207-1065) million yards were then obviously woven from handspun. At 3½ yards of khadi cloth to a pound of yarn, this means that the output of handspun was 320 million pounds, while the supply of machinespun yarn remained limited to 50 million pounds. An estimated 86 per cent of the country's yarn requirements for weaving were then still met by her hand sector, contrary to Bayly's naive belief that European yarn had "completely wiped out Indian spinning before 1850, except for the production of 'sacred thread' ....." [Bayly : 1983, p.291_7.

All said, let us now try to quantify the decline in the textile employment of the 1830-60 period. For this we need working estimates of the average annual outturn of yarn per spinner and of cloth per loom. These could be approximately derived from work studies done in the past, as the one sponsored by the All India Spinners' Association. Taking cue from J. Taylor, it suggests that handspun yarn up to 60 counts could be spun on the charkha. But for still finer counts the use of takli(tākwa) becomes necessary. In former days, the average annual outturn per takli spinner could be even as low as eight pounds of superfine yarn. A charkha spinner, working ten hours a day for 292 days in the year, on the other hand, can produce 90 pounds of 15s yarn on an average [Puntambekar el et : 1926, pp.33-41, 202_7.

With an assumption of 275 ten-hour working days in the year, the above estimate comes to 84.7 pounds per spinner per year. The same source further says that 40 pounds of 15s yarn would yield 192 square yards of khadi cloth [ibid, p.159]. This means that 84.7 pounds of 15s yarn, i.e. what a full-time spinner produces annually, would yield 407 square yards of khadi cloth. The same source, again, indicates the cloth output from 15s yarn per loom-year (292 days) to be in the range of 1000 to, in most cases, 1500 square yards, It then accepts 1200 yards as the acceptable average [ibid, pp.161, 202]. This would come to 1130 square yards of cloth per loom for a 275- day year. Incidentally, N.N. Banerjei in 1898 found the productivity of/a throw-shuttle handloom weaver to be one and a half yards a day, i.e., 413 yards in 275 days [Banerjei : 1898, pp.48-9]; while the Textile Enquiry Committee found it to be two to five yards a day, or, 550 to 1375 yards annually [GI : 1954, p.11]. The Madras Board of Revenue concluded in 1869-70, after a careful enquiry, that the Madras weavers, maintaining reasonable working time norm, used 162 lbs of yarn, mostly of 20s - 40s range, per loom-year [Indian Economist : 21 December 1871, p.39]. But it did not work out the output in yardage terms. Given such diverse and conflicting information, the average worked out by the All-India Spinners' Association appears most sensible as a starting point, particularly since it has accepted 15s as the representative yarn count.

Extent of Fall in Employment

According to the Government of India's Fact Facting Committee (Handlooms and Mills) of 1942, a loom working

275 days a year, could produce 642 square yards of fine cloth, using 80s and 100s yarn; 1444 square yards of grey cloth using 20s machinespun; or, 2063 square yards of course khadi cloth, mostly below 15s [GI : 1942, appendix 23, p.294]. Lower the count, more the loom output - is what follows from the above facts. Woven with 15s yarn, how could then the average cloth output per loom-year be only 1130 square yards, as against 1444 square yards woven with 20s ? Neither could it be 2063 square yards, as in the case of khadi cloth of much lower counts. Further, we argue that the yardage displaced by foreign goods at this stage was mostly fabricated out of yarn finer than 20s. Under the circumstances, the per loom-year productivity for the 1830-60 period may be somewhat arbitrarily taken at 1200 square yards.

As to the average number of weavers per loom during 1830-60, it could have varied from 2.25 to 1.25 depending on the fineness and complexity of the patterns woven. This is what the relevant details in the Reports of India's Textile Enquiry Committee of 1954 and the Pakistan Fact Finding Committee on Handlooms of 1956 suggest [Prakash : 1976, pp.35n, 36n]. In the light of the above facts, we then assume in our particular context the full-time employment potential per loom to be eight persons in all - two weavers, 4.5 spinners and 1.5 additional hands for the carding, bleaching, printing, dyeing and finishing processes. This gives us an average productivity of 150 yards of cloth per working person, as against an estimated 140 yards in the case of Britain's inchoate cotton textile industry of the pre-flyshuttle age, as of 1720 [Twomey : 1983, p.51n]. It should be noted that

the ousted portion being the finer part of the Indian production, it needed more working hands per loom than the average for the industry.

Let us now pick up the threads of our earlier discussion we left unfinished. Given the above working estimates, the aforesaid displacement of 766 million yards between 1830 and 1860 would then mean the laying off of 638,333 looms (each accounting for 1200 yards annually). This, in turn, would mean a loss of 1.23 million full-time weaving jobs, 2.87 million full-time spinning jobs and 0.96 million other textile jobs — altogether 5.11 million jobs. Spinners suffered from the influx of not only foreign piecegoods, but also foreign yarn, the supply of which meanwhile increased by at least 25 million pounds. This alone must have displaced then another 0.31 million spinners, assuming per spinner an annual productivity of 80 pounds of yarn. Thus, during the three decades ending 1860, altogether 5.42 million full-time or their equivalent part-time jobs in India's textile industry (hand sector) appear to have been knocked off by foreign competition; and in the last of these decades, also another two and a half lakh jobs, by competition from the Indian mills. Incidentally the cotton mills by then gave employment to no more than some five thousand hands.

Now let us allow for a population growth of 25 million between 1830 and 1860, in the same way as M.D. Morris would do [Morris : 1974, pp.311-2] and assume a constant per capita cloth consumption of nine yards (see our Table 7). An additional population-induced domestic demand for 225 million yards will then have to be taken into consideration; and our relevant

estimates, reworked on the basis of only 450,833 laid-off looms. The revised figure for full-time cotton textile jobs lost due to foreign competition would still remain above 3.91 million. If the assumed per-loom employment potential of eight persons appears too high, it may be revised to six persons — 1.5 weavers, 3.5 spinners and one extra hand. Fulltime jobs lost would still remain 3.0 million.

To sum up, the decline of handloom output was continuous. Up to about 1840 it was mainly due to both British competition and unfair colonial tariff policies; and thereafter, mainly because of the first factor. In 1840, East India was already receiving 145 million yards of Britich cloth. But this supply reached out mainly to consumers of fine and middling sorts all over India, excepting her eastern and northern hilly regions. Nonetheless, the supply was unevenly spread out, with a greater concentration in the coastal areas and the Gangetic plains. By 1845, 229 million yards, i.e. more than one-fifth of the British piecegoods exports were destined for East India, while their quality index (in real value terms) apparently had dropped down by then to around 57-60 from 100 in 1815 [Sandberg : 1968, p.7].

The 1860s Crisis

The colonial trade and credit network, backed by administrative policies, systematically destroyed the organised part of the handicraft sector and its associate trade circuits so that port-oriented alternate trade circuits, integrated to the same network, could be built on the basis of an unequal exchange of raw materials for British

manufactures. Once this was by and large achieved, restrictive tariffs as a policy were no more found necessary, and there was a shift on the part of colonialism to what is called 'imperialism of free trade'. In 1858 India's intake of British piecegoods was 728 million yards and of British yarn 34 millior pounds [Valpy : 1860, p.70]. The former figure would have crossed a thousand million yards by the early sixties, had there been no sudden outbreak of the American Civil War (April 1861 - May 1865), bringing a world cotton famine in its wake.

The impact of the American Civil War on the world cotton prices, a rise of three to four times over the pre-War price level, was not felt before 1862. This was because the blockade of the USA's southern ports had started only after her bumper cotton harvest of 1860/1 had been shipped. Her share in the UK's raw cotton imports dropped abruptly in 1862 to a low four per cent. It was an average 75 per cent during the preceding seven years, when India's corresponding share was only 19 per cent. But in the seven-year period, 1862-68, India's share increased to 28 per cent while the USA's was 50 per cent [Helm : 1869, pp.428-9]. India's share further rose to 31 per cent in 1872 [Habib : 1985, p.364n.]. Lancashire's continued efforts to fill up the supply gap with Indian cotton pushed up its prices enormously during those crisis years as is evident from our Table 2.

In the North Western Provinces, at Farakkabad, cleaned cotton that cost Rs.9.4 a maund in 1860 shot up to Rs.13.9 in 1862 and to Rs.27.6 in 1863. At its height, the Bombay price for the best Indian variety was Rs.45 a maund [Borpujari : March 1973, pp. 39-40]. Surats were selling at 12 to 24

pence per pound in the UK. Under such a price impetus, the acreage under cotton in India as well as its output and export - all were rising fast. But the growth of output lagged far behind that of demand [Ellison : 1969, p.143], and because of inferior lands coming under the plough, the yield per acre presumably decreased.

According to our estimates, as worked out in the Appendix, the ratio of export to the net output (i.e. gross output net of 10 per cent wastage-cum-leakage) increased from 29 per cent during the five years ending 1852/3 to 63 per cent during 1865/6 to 1869/70. In absolute terms, it meant about a three times increase in the volume of exports, from an average 215.5 million to 619 million pounds per year between the two quinquenniums. It appears therefore that no less than one-half to two-thirds of India's net raw cotton output found their outlet during the Civil War years to the foreign, mostly British market. The imperialism of free trade thus allowed a man-made cotton famine to take place within the country. So bad was the situation that some raw cotton was even carried there from China [Mehta : 1954, p.30].

The raw material shortage in turn caused a severe shortage of yarn, both handspun and machinespun. Only whatever cotton Lancashire failed to buy up because of transport and market bottlenecks, was spun by those who could afford to buy the expensive raw material or were themselves either growing it or receiving it under barter terms. Indian mills' cotton consumption declined from about 26 million pounds in 1860/1 to 12.8 million in 1862/3, and it amounted to an average 23.5 million in the quinquennium ending 1866/7. So there was

commensurate fall in their yarn output [Ellison : 1968, p.104; Watt : 1890, pp.53, 158]. Yarn imports, too, fell heavily and could not reach the pre-War peak level even by the latter year [Table 2].

All this forced a drastic cut in cloth production. Many of the fledgling mill sector's three and a half thousand existing looms remained laid-off. Others worked below capacity. Similar was the fate of handlooms. An enquiry into the alleged slackness of demand for European goods was carried out in the North Western Provinces and its report was published [G.NWP Selections : 1864, pp.116-55]. This official report and its analysis by J.G. Borpujari confirms the fact of a largescale occupational dislocation of textile workers taking place during the 1860s. Of the 55 reporting areas, 54 reported a fall in the number of active handlooms. The returns also indicated about a 25 per cent over-all fall between 1860 and 1863 and a considerable decrease in the capacity utilisation of the active ones. There were reports of weavers' destitution and their moving into agriculture, unskilled wage labour or beggary: some even left for Mauritius [Borpujari : March 1973, pp.43-5]. If such were the conditions in a cotton-growing province, one can imagine how worse the situation could be in the cotton-poor Bengal Presidency.

Like internal production, cloth imports too were severely affected. S.D. Mehta's estimates, as detailed below, indicate a 42 per cent fall in the total quantity of foreign cloth imported during the War years under consideration [Mehta: 1854, p.32].

Ports of Entry	Pre-War Average* (m. yds of cloth)	War Years' Average (m. yds of cloth)
Bombay	288(100)	190(66)
Madras	18(100)	15(83)
Calcutta	446(100)	232(52)
Total	752(100)	437(58)

[* The years averaged are not specified.]

The above data further show that the fall was heaviest for Calcutta being 48 per cent; and the lowest for Madras, 17 per cent. Besides, the fact that Calcutta always received more than half of the foreign cloth supply suggests one more thing. The weaving industry was by then ruined far more completely in the eastern than in southern or western India.

Thus mills, Indian or foreign, as well as handlooms — all were facing an acute production crisis. Consequently, India's per capita cloth consumption must have dropped down to a level much below the norm of 2.5 lbs, carefully estimated in 1848 by John Briggs [H.C. Vol.9, No.511 : 1848, p.119] and which we have taken to be equivalent to nine yards. Did it drop down in the 1860s to a permissible all-time bottom limit for any civilised society ? Could it be, as in China of 1871-80, an estimated four to six square yards ? [Feuerwerker : 1970, Table 8, p.367]. Perhaps so. "It is evident ..... " concluded the official from Kanpur reporting on the cloth crisis in the North West Provinces,

> "that the whole population must be far nearer a state of pristine nudity than before ever. This is actually the case. Every poor person

stints himself to an inconceivable degree in his clothing and every purpose to which cotton is applied; he wears his (turban) and breech cloth to rags; dispenses with his body clothing and denies himself his annual renewal of his scanty suit" [G.NWP, Selections : 1864, p.146_7.

Regional Variations in Crisis Situation

All said, it was also true that the cloth famine in the cotton-growing tracts was generally less severe than elsewhere and that the fabulous gains of cotton trade did percolate in those areas down to the grassroots to a varying degree. But their apparent prosperity proved to be transitory and elusive [Gadgil: 1973, pp.17-24_7. Whatever new employment opportunities the expanding public works and extended cultivated acreage generated in the country failed to adequately absorb the dislocated textile workers. Unemployment and Underemployment in the textile industry at this juncture were induced not so much by a technological lag as by the raw material shortage. By 1870/1 or so, the depressed levels of cloth production and handloom empoyment somewhat improved. But this did not reverse the hand sector's long-term declining trend during the coming decades of the increasing British monopoly domination in every sphere-trade, finance and production.

What happened in the sphere of the cotton trade may particularly be noted here. Lured by high profits, Bombay-based European firms linked to the London money market, began to directly procure raw cotton from the interior for exportation on their own account, in competition with Indian traders who had heretofore acted as their agents or associates. As a result, Indian consignors' share of the cotton exports to Liverpool,

which they had improved from 55.6 per cent in 1851 to as high as 67.2 per cent by 1861, came down to a bare 27.8 per cent in 1875 [Vicziany : 1979, pp.163-96; Guha : 1984, pp.126-37] and then to less than one per cent by 1890/1. In that year, out of the 1070,166 bales of cotton exported from Bombay to the UK and the Continent, only 10,589 bales were reportedly by Indian firms and the rest by the city's thirtyfive European firms. This fact was put on record at the Second Industrial Conference, Poona in 1892 [Namjosi : 1892, p.ii]. These data unequivocally show how the gains from India's expanding cotton trade were distributed.

The crisis of the 1860s brought one important change in the situation. While weavers as a class faced impoverishmen those of them who had enough resources to remain in business prospered because of the supply constraint. Besides, cloth manufactories were set up here and there by merchants, thereby helping hand-weaving to survive. In Punjab, for example, eighty-four such manufactories were, between them, annually marketing cotton goods valued £ 1.8 million by 1871/2. Similar manufactories were doing considerable business also in Nagpur [H.C. Vol.50, No.172 : 1873, pp.92-100]. By this time, it appears, manufactories in the Madras Presidency too helped strengthen handloom production [Specker : 1989, pp.145, 152]. Yarn imports via the port of Madras into southern India, mostly in the range of 20 to 42 counts, increased fourfold between 1851/2 and 1870/1. This and the relatively lesser import of foreign cloth there as compared to other areas, as already noted, facilitated the revival. According to the Madras Board of Revenue, the yarn imports in 1869/70 amounted to 11.2 million pounds, or about a third of the total yarn consumed by the looms of the Presidency [Indian Economist, 21 Sept. 1871, p.39].

After district-level enquiries in the Presidency, the Madras Board found the number of active handlooms to have increased from an average 204,623 during the five years ending 1860/1 to 279,220 in 1869/70, i.e., by about 42 per cent. However, finding the earlier set of the data not exhaustive, it finally concluded that the increase could be easily 20 to 25 per cent, and it was partly due to the abolition of the vexatious motapha tax in 1861. But even this much increase seemed highly doubtful to an official on the spot. The pace of increase was not similar in all districts, and some even recorded a decline. The bulk of the looms were in villages, most of the weavers being primarily cultivators and weaving in slack seasons only, and many working half to three-quarter time [ibid, p.39; ibid, 22 July 1872, pp.224-5]. Therefore the sheer number of looms should never be taken as an index of weavers' output as scholars have often done [Specker : 1989, pp.131-66].

These observations could be as well generalised for the whole country. By 1870/1 weavers, in general, knew that it was only in the coarse and the artistic products of finer taste that they could stand competition from machine-made goods and that their future was bleak in the range of products in between. Lancashire, however, continued its efforts to penetrate even those areas of production where handlooms had competitive advantages. By 1870/1 the quantity of cloth imported exeeded 1000 million yards and in another two decades, 2000 million yards. From 1879 imports of all grey goods made of 30s and lower counts, and from 1882 also of the remaining categories, were made free of import duty. In the 1890s such import duties were reimposed, but at the same time

countervailing excise duties also were imposed on India's mill products to blunt their competitive edge. The invasion of foreign cloth, almost entirely British, continued unabated until by 1913 the quantity imported crossed the mark of 3000 million yards.

II

Estimates of Handloom Production after 1870s

What happened to handlooms after 1870/1 ? Let us work out a methodology to trace in quantitative terms what happened upto 1904/5. How much cotton lint to spinning mills and spinners, how much yarn to the weaving mills and weavers, and how much cloth to consumers in India were available in different quinquenniums ? These are the questions to answer. If one could approximately quantify the net cotton lint supply available to hand-spinners from quinquennium to quinquennium, one could set an upper limit to the availability of handspun yarn, and hence also to handspun-based part of handloom production --- our terra incognita. Our quantitative exercises that follow show that this part, as expected, considerably shrank in course of the 19th century.

Also, it is possible to construct for our period a fairly accurate time series of the net supply of machinespun cotton yarn (domestic production + import - export) to the Indian weaving industry as a whole. However, there is a lack of breakdown data as to how much of it went into machinelooms and how much into the handlooms. This difficulty can nonetheless be, by and large, overcome by utilising certain stray

information in the available literature. All yarn imports could be taken as inputs of the handloom sector, since mills hardly used them. Then, as to the distribution of domestic machinespun yarn between machinelooms and handlooms, certain proportions could be realistically assumed, given the annual quantities exported, the year-to-year changes in the machine sector's spindlage-loomage ratio, specific observations occasionally on record about the respective shares, and hindsight.

Thus, it is possible to examine in a quantitative-chronological framework the whole question of the impact of the British industrial revolution on our handloom industry. Our purpose, to repeat, is to bring the supply side into focus and then to relate it to the economic logic of the situation. While many have tried in the past to come to grips with the decline of Indian handlooms with an approach from the demand side [e.g., Desai : 1971, pp.337-61], no adequate attempt has so far been made to view it from the supply side. Instead of starting with the question as to how big from time to time was the demand for the textiles, we might ask how large was really the supply of the basic material — raw cotton. And how much of it did actually reach the weaver in the form of handspun and machinespun yarn, besides what was imported for him ? If these variables could be approximately quantified, we would indeed find out how much handloom cloth was or could be periodically woven, on an average.

Estimating Availability of Raw Cotton

The raw cotton account for the years 1848/9 to 1852/3 and 1865/6 to 1904/5 is presented in the Appendix and, in a

summary form, in Table 4. There is a gap in our time series. This is because no reliable cotton acreage estimates could be made for some years in the absence of adequate official data, however fragmentary. Yarn and cloth accounts are presented in course of Tables 5,6 and 7. We have taken quinquenniums as the reference points with a view to eliminating the year-to-year climatic variations in crop yield so that by multiplying acreage by our assumed average yield, we may get the gross output of lint cotton first and, from it, finally also the net output available to the country's mill and hand sectors. Our methodology in this respect was first worked out in 1972 in course of an unpublished working paper [Habib, 1985, pp.363-4]. Later we constructed an all-India cotton acreage time series covering the period from 1848/9 to 1904/5 with some gaps in between, and it was published in 1973 [Guha : 1973, pp.1-56]. This time series is based on whatever official fragmentary data could be collated region by region, and duly adjusted for spatial gaps. All this is done in such a manner that its British-Indian portion could be linked to and merged with the Blyn Series for the period 1892/3 to 1946/7 [Blyn : 1966, pp.288-91]. For our present work, the aforesaid 1973 time series, with minor modifications, provides the starting point for all our calculations and extrapolations. It may be further noted that our own cotton acreage figures are generally higher than the comparable all-India official figures, published from time to time. For example, our figure for 1900/01 is 15.5 million acres as against the official 13.8 million acres [ibid, pp.47-50]. Similarly, our figure for 1888/9 is 15.1 million acres as against the official 14.6 million acres [Watt : 1890, p.52].

In short, we have tended to overstate rather than understate the country's cotton resources of the post -1870 period.

Our per-acre yield assumptions in Table 4 for different quinquenniums are also higher than the relevant official all-India average yields, or the periodic averages of annual yields, as reflected in the Blyn Series and other studies. For example, the average per-acre yield for the decade 1891/2 to 1901/2 in the Blyn Series comes out to be 71.1 lbs per acre, and for the period 1900-1947, it is worked out by Sivasubramonian [unpublished Ph.D Thesis, Delhi School of Economics,1965] to be 0.031 tons or 69.4 lbs approximately. But if such low yields are taken for granted alongside of any available all-India cotton acreage series, the situation turns out to be absurd for certain years. That is,nothing of the raw cotton output is then left for handspinners in many of the years after accounting for wastage/leakages, exports and the consumption of the domestic spinning mills. This point may be concretely illustrated with a reference to Quinquennium IX. Even if we assume a yield as high as 80 lbs per acre, the annual gross output turns out to be only 1400.1 million lbs for the quinquennium. Given an export of 647.6 million, import of 13 million and spinning mills' raw cotton consumption of 651.9 million pounds, this leaves a residue of only 118 million lbs of cotton. This then will not even cover the wastage/leakages at 10 per cent of the output, let alone leaving anything for handspinning. A mere glance at the calculations, we have done for the years 1898/9, 1899/1900, 1901/2 and 1903/4 in our exercise (based on an assumed yield of 87 lbs lint cotton per acre) in the Appendix, will further clarify this point.

Around 1850, the average yield must have been much higher than what prevailed later when inferior lands were increasingly coming under the plough, with little improvement in soil conservation, seed quality and irrigation facilities. The rising exports led to a slow expansion of cotton acreage already by the 1850s. During the American Civil War years in particular, the price incentive became so great that there was a land rush for cotton growing and, as a result of much marginal lands coming under the crop, the average yield must have declined sharply. Cotton acreage did not stop to expand even thereafter, because of a fall meanwhile in transport costs and growth of new markets abroad. All this sustained the high level of raw cotton exports even at low prices, which never again reached the 1873 level during our period [Table 9.7]. We have therefore assumed 92 lbs as the average yield for Quinunennium I, and 87 lbs for Quinquenniums II, III, V, VI and VII. For Quinquennium IV, however, as the normalcy was very much disturbed because of two consecutive famines (1876-1878), we have felt the need for deflating the average yield to 80 lbs. However, even this figure, given our acreage figures, appears too high. For Quinquenniums VIII and IX, also disturbed by famines and a plague, we have assumed an average yield of 84 lbs per acre. In fact, what should concern us is neither the acreage nor the yield as such, but the gross output (acreage x per-acre yield). So, while making our own yield assumptions, we have also kept in mind all comparable official estimates of the gross output made from time to time, with a view to making our output estimates look realistic.

Now a question may arise as to whether our wastage/ leakage rate assumed at 10 per cent of the gross output is realistic or not. In 1890, it was estimated that 47 million

lbs of cotton would be necessary to provide a population of 250 million people with wadding [Watt : 1890, p.55]. On the other hand, for China of 1871-1910 one pound per capita has been suggested as the wadding requirement [Feuerwerker : 1970, pp.338-78]. In the light of all such observations, our estimated wastage-cum-leakage rate at ten per cent should appear to be reasonable. Finally, all yarn retained within the country did not enter into cloth; there was some leakage into other uses as well, such as making wicks, sacred threads, sewing threads, braids, newar etc. The Fact Finding Committee [G.I. : 1942, p.53] estimated such leakage for 1901 at 4.7 million lbs. We have overlooked this leakage in the case of machinespun yarn going into cloth production, but have notionally taken it to be one per cent while estimating the amount of handspun available to handloom weavers. After all, it was rural people who mostly accounted for such leakages.

Handspun Yarn

We feel that our post-1870 estimates of the supply of handspun yarn [Table 5] are rather on the higher side. Raw cotton stocks remaining unsold due to export market vicissitudes in years of surplus crop often left no choice to villagers other than turning those stocks into spun and woven goods, even though not really wanted. Alternatively, those stocks might simply be carried over to the next quinquennium or utilised to make more quilts etc. In that case, the declining trend in handloom output might have been more smooth than is apparent from our excercise (see Figure 1 and Table 6). What is of significance for this study is the relative order of magnitude of the handspun component in the

total quantum of yarn turned into cloth from period to period. In this connection, a recent estimate of handspun yarn production deserves mention. We are putting our own relevant estimates from Table 5 alongside of Twomey's estimates /Twomey; 1983, p.46 Table 5_7 below :

Output of Handspun Yarn

Quinquennium Ending	Our Estimates (m.lbs)	Estimates by Twomey (m.lbs)
1852/3	492	-
84/5	343	150
89/90	271	140
94/5	217	130
9901900	44	120
1904/5	34	110

These two sets then, between them, indicate the range of handspun-based handloom output during the quinquenniums concerned. Our Table 6 (Col-6) shows a long-term declining trend in the total handloom output, both handspun-based and machinespun-based taken together. 'Decline - stagnation - decline' is the pattern that emerges.

During the years 1861/2 to 1865/6, as we have already discussed, India's handloom production as well as per capita cloth consumption — both came down to a low level, perhaps the lowest-ever. The situation did improve subsequently, but not much in our Quinquennium II, i.e., the years 1865/6 to 1869/70 (our Table 6). The deficiency in handloom production persidted till then, because of the acute foreign competition in the raw material market.

Table 5 is revealing in more than one respect, In the early seventies of the last century, i.e. Quinquennium III, Indian mills produced annually about 36 million pounds of coaurse yarn; and of this, 19.2 million pounds were sold to the weavers. The latter also used imported machinespun of finer counts, amounting annually to 33.5 million pounds and handspun, to the extent of 313 million pounds. The latter, presumably, was almost entirely of the coarser varieties. The supply of Indian machinespun to handlooms since then continued to increase much faster than that of imported yarn until both were at par during 1885/6 to 1889/90. In the next three quinquenniums the former increasingly and by far, exceeded the latter. Meanwhile, the estimated supply of handspun also decreased heavily, dropping down to a bare average of 34 million pounds during 1900/1 to 1904/5. All this can be seen from our Table 5. In the composition of handlooms' total yarn consumption, the percentage share of total machinespun, India-made and imported, leaped meanwhile from 14 to 86 per cent and that of handspun went down from 86 to 14 per cent between Quinquenniums III and IX. However, even this largescale replacement of handspun by machinespun could hardly reverse the declining trend in the handloom production. It first brought stagnation, with some oscillations, of course, because of the uncertainties of the raw cotton availability position; and then a fall. The handloom production was about 26 per cent less in 1900/1-1904/5 than what it was in Quinquennium III [Tables 6 and 5]. This clearly shows that weavers as a class, still struggling, did not have enough steady work.

Domestic Demand and Imports

In Tables 6 and 7, we have estimated India's cloth consumption, both total and per capita, respectively. Because of the population growth and the cheapening of cloth, her home market for cloth expanded. Between the two Quinquenniums III and IX, while her cloth imports doubled, her own mill production almost trebled in terms of yardage. Even so in Quinquennims VII, VIII and IX, Indian mills produced only 28 yards, 20 yards and 26 yards respectively, for every 100 yards imported. In the last Quinquennium, for example, as against 2124 million yards of imported cloth, handlooms produced less than a thousand million yards and the mills, only 542 million yards [Table 6_7. Between Quinquenniums I and III, India's handloom output decreased by 534 million yards while cloth imports increased by 689 million yards and domestic mill production, retained for consumption, by 55 million yards. Again, between Quinquenniums III and IX, the handloom output further decreased by 340 million yards while cloth imports increased by 1121 million yards, and retained domestic mill output by only 414 million yards. These data leave no doubt that handlooms lost their market primarily to British competitors. India's share of UK's total cloth exports increased in terms of yardage from 21 per cent to 43 per cent between 1845 and 1898 [Sandberg : 1968, p.9_7. In terms of real value, their quality index meanwhile apparently dropped to 84.5 from an index of 100 in 1845 [ibid, p.9_7.

It is often argued that imports did not compete with Indian goods, but catered to new demand for finer cloth, which India could hardly produce with her shortstaple cotton resources.

Such a view is difficult to accept. Had the Government encouraged, fine cloth also could have been produced from imported yarn and imported long-staple cotton, locally spun into yarn. But on profit considerations, UK exporters were much more interested to sell cloth rather than yarn. Moreover, the colonial government discouraged importation of Egyptian and American long-staple cotton by introduceing a duty on such imports under the Tariff Act of 1875 [Mehta : 1954, p.35]. Since the 1870s cloth imports were apparently dominated by unbleached grey goods; for example, to the extent of about 66 per cent by value in 1875/6, and 59 per cent in 1888/9 [Watt : 1890, p.171]. There are reasons to suspect that a considerable part of this stuff was made of yarn of 30s and lower counts. Debdas Banerji highlights in his essay that nearly 49 per cent of all imported shirtings in 1879/80 were of 30s and lower counts [Unpublished paper, CSSSC]. It was to boost imports of such inferior grey piecegoods that the Indian tariffs on such goods were abolished in March 1879. George Watt, a contemporary observer, conceded that cloth imports steadily increased partly due to population increase and "partly by the gradual ousting of the old handloom manufactures owing to the increasing popularity of the attractive, though less durable, goods of Manchester" [Watt:1890,p.170]. It is our hunch that the competition between handloom goods and imported piecegoods was within the range of 20s-42s, and it was here that imports harmed handlooms most. Imported foreign yarn largely belonged to this range. We also know that by 1897/8, about 12 per cent of India-made mill yarn belonged to 21s-30s range [GI. : 1902, p.330]. By 1900/1, one-fifth of India-made mill yarn was above 20s [Mehta : 1954, p.80].

Colonial research and development efforts were misdirected, in an attempt to appease Lancashire, towards infructuously introducing exotic long-staple cotton varieties in India, rather than improving local short-staple ones and making their best use. If some countries like Germany and Japan could have gone ahead largely with Indian short-staple cotton during the same period despite British competition, why could not India ?

> "Parliament inquired how cotton could be grown in India for British looms not how Indian looms could be improved. Select Committees tried to find out how British manufactures could find a sale in India, not how Indian manufactures could be revived" [Dutt : 1970, II - p.Vii_7.

The 1860s had brought a great opportunity to her cotton industry which colonialism did not permit to be seized. It is an irony of history that, even as handloom weavers were facing an acute crisis in the North Western Provinces in the early 1860s, the authorities there ordered an enquiry not into their problems, but to find out why the demand for "European" cotton goods had slackened. Had high protective export duties [on cotton] been levied at that juncture and had research and development been on the right lines, India could have made both her cotton mill and handloom sectors viable much earlier than the inter-war period.

In that case, a wide and early acceptance of flyshuttles by weavers, too, would have been a realisable proposition. The flyshuttle looms were first introduced at Serampore and Chandan-nagar in Bengal as well as in the

Malabar coast by Christian missionaries quite early by the 1860s, but not on a mentionable scale until the beginnings of this century [Banerjei : 1898, pp.48-9; Cumming : 1908, pp.7-8; GI : 1942, p.6_7. By 1940, 34 per cent of India's looms had flyshuttles. Regionwise, the proportion was, for Travancore, 89 per cent; for Hyderabad, 87 per cent; for Madras, 81 per cent; for Mysore, 78 per cent; for Cochin, 73 per cent; for Bengal, 67 per cent; and for Bihar-Orissa 34 per cent; Surprisingly, this percentage was in Pubjab, still only 5 per cent [GI. : 1942, pp.26-30_7. Between 1874/5 and 1904/5 the average per capita cotton cloth consumption in India did increase, say, from 9.26 yards to 12.33 yards, but foreign cloth constituted more than half of it [Table 7_7. How could handlooms thrive under such circumstances ? The increase in per capita consumption is to be partly explained by consumers' increasing preference for less durable, more heavily-sized cheaper cloth, which required more frequent replacements.

III

Conclusion

Conclusions drawn from our collated data and estimates vindicate the generalisations made long back by R.C. Dutt and later, also by D.R. Gadgil. Unmistakably, India's cotton handicrafts industry exhibited a log-term declining trend during the nineteenth century. Next to agriculture, it was traditionally the biggest employment generator. So, the massive unemployment and underemployment, caused by its decline, could have hardly been compensated by the new job opportunities

generated by the colonial 'development' thrust. That is why, we presume also a general economic decline and deindustrialisation during the nineteenth century, the case for such a situation having been effectively argued by A.K. Bagchi [Bagchi: 1979, pp.147-62].

The decline of handlooms was not necessarily at the same pace everywhere or in every period. There were fluctuations in the level of spinning and weaving activities, almost from year to year depending on the uncertainties pertaining to the output, international price and export level of Indian raw cotton, particularly since the 1860s. Almost the whole foreign and a part of the home market were lost for Indian textiles in the first half of the nineteenth century. As a result, muslin weaving in general and takli-spinning, as well as, the cultivation of certain special varieties of cotton - all practically disappeared by 1840. Handlooms continued to face Lancashire's competition in the product market while their lowest possible performance in the 1860s, in particular, was due also to the same competition in the raw material market. Lancashire took over more and more of Indian weavers' low-quality market until the process was retarded in the Swadeshi days. In the situation of a lingering stagnation and decay, handicraft weavers continued somehow to eke out a precarious living, while the dividing line between them and unskilled general labour almost vanished. Finally, after a drastic fall during the last decade of our period, handloom employment firmly stabilised itself at a new level. There was a reassertion on the basis of an increasing manufactory-type production organisation, an increasing dependence on merchants for material and market,

a near-complete replacement of handspun by machinespun yarn and improved tools. Handspinning was practically finished by the 1890s, but not totally. Its annual output was variously estimated from time to time at some 24 million lbs by the Indian Tariff Board (1932), 9.2 million lbs by the All-India Spinners' Association (1939) and 54.4 million lbs by the Fact Finding Committee [G.I. : 1942, p.110].

The decline was not always due to the technological and comparative cost disadvantages alone. Discriminating colonial tariffs enforced, adjusted or withdrawn from time to time to suit Lancashire, also contributed to it. All these factors forced the weavers to change their production and marketing methods, to limit the range of their products and, in most cases, also to adjust themselves to a lower income level. The theory of an increasing demand due to changes in taste, population and price, ~~xxxxxxx~~ or due to the cheap machinespun yarn coming to the beleaguered weavers' rescue, is not new. For instance, Gadgil had raised these issues long before M.D. Morris, but he concluded that there was, nevertheless, a long run decline - slow and discontinuous, but general - until halted towards the close of the century. The period of decline also differed, according to him, from region to region and was large always at its initial phase when competition was first faced [Gadgil : 1973, pp.177-83; Gadgil : 1955, pp.453-4, 458].

While holding colonialism responsible for weavers' plight, Dutt was not unaware of the technological aspects of the question. "A truly national Government", he believed, "would have sought to preserve the old national industry of India by introducing new and improved methods ... ". Belated

official endeavours made in different places and specially in Madras towards helping weavers in this respect did not escape his notice. "Their methods are susceptible to improvement, and their output could be largely increased by the use of improved looms . . . It is too early yet to say", he observed in 1903, "what the result will be; but it is confidently believed that, with necessary improvements, handlooms will be found to answer, at least for certain descriptions of goods" [Dutt : 1970, II- pp.118, 377-8]. Developments in the twentieth century, by and large, upheld this confidence of his. We submit that our quantitative enquiries into the supply side of the question, do yield broad conclusions that support the nationalist views of Dutt and Gadgil.

Finally, before we close the discussion, the data base of our above conclusions needs to be once more checked for a further clarification. The almost continuous increase in the acreage under cotton, as envisaged, is [illegible] warranted by whatever fragmentary statistics are available for the major cotton producing regions. Our assumption of the per-acre yield of cotton [illegible] tending to fall over the decades, on the other hand, is somewhat arbitrary and hence, it might be objected to for introducing a built-in downward bias in our argument. However, even if we assume a constant per-acre yield for the whole period under review — say at 84 lbs — the decline-stagnation-decline scenario [Fig.1] will not be substantially altered. The chain of exercises reworked on this basis will still leave the net supply of machinespun yarn to the handlooms (as shown in Table 5) unaffected, while affecting the supply of handspun for the first seven quinquenniums and hence, also the total yarn

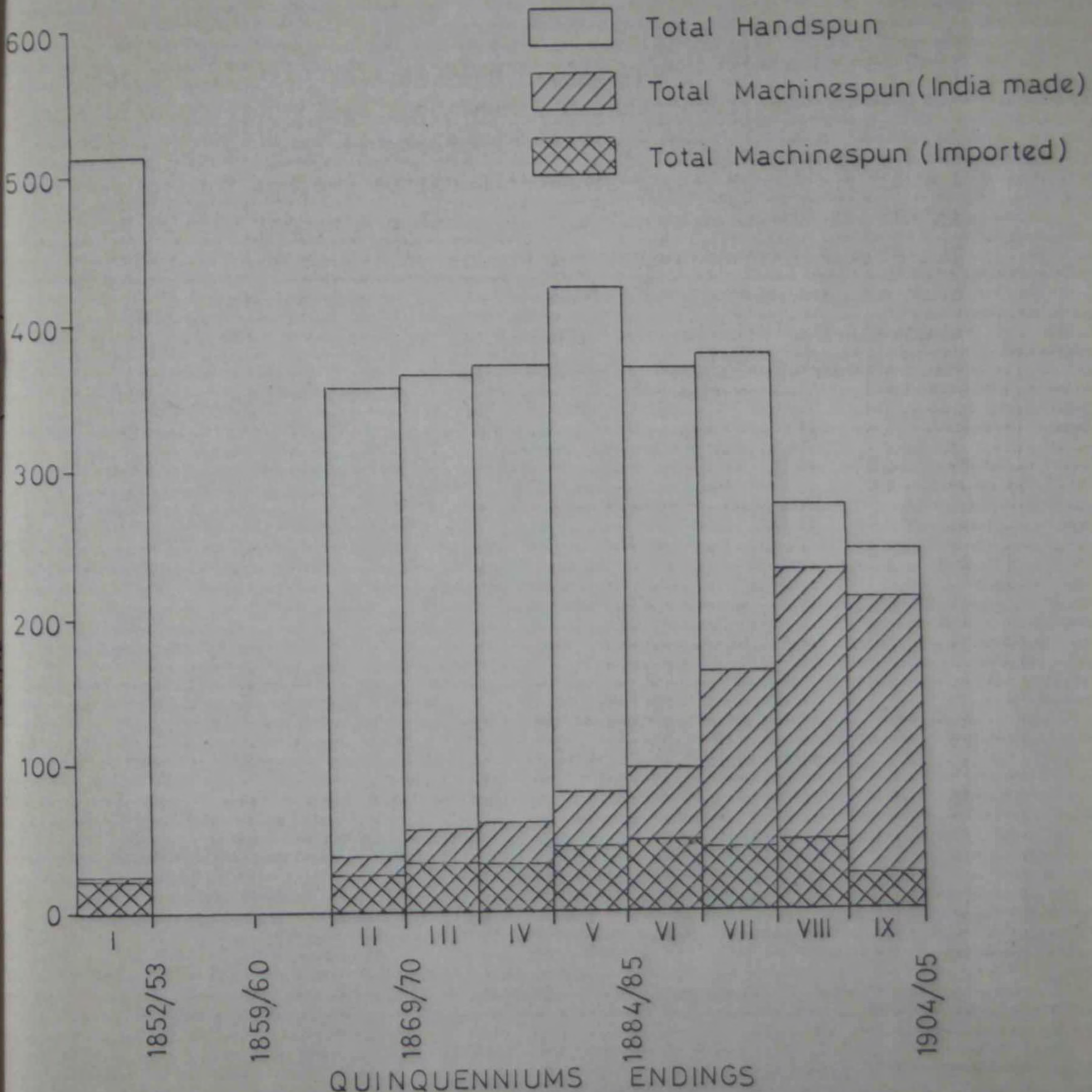
supply to the handlooms, marginally. All this can be seen from Figure 1 and Table 8.

While interpreting Table 8, it should not however be forgotten that the severe impact of famines in Quinquennium IV has been somewhat understated therein. Besides, much of the raw cotton assumed to have been homespun during Quinquenniums III to VII might have instead actually gone into the making of quilts etc., or simply into waste, thus pushing up the wastage-cum-leakage rate. Neither spinning nor weaving with handspun material was any longer held profitable. Yet such activities had to be undertaken by the villagers since they had nothingelse to do with their surplus cotton.

In our exercise, what appears as a phase of stagnation was in fact a period of increasing distress for the weavers in general. For Quinquenniums III to VII, the successive levels of handloom production, we repeat, have possibly been overstated in our exercises. In all probability, the trend in the handloom production during those quinquenniums, too, was one of a smooth decline, rather than of stagnation with sharp oscillations. Our findings refute the die-hard view that expanding British cloth exports to India, at worst, only "skimmed off the expanding demand" and that her "handloom weavers were at least no fewer in number and no worse off economically at the end of the period than at the beginning" [Morris 1963, p.9]. M.D. Morris's argument is that the official statistics giving the count of looms, extant in the Indian subcontinent, at a high 2.2 million for 1940 [G.I. : 1942, pp.26-8] and 3.1 million for 1951 leave no scope for hypothesising any decline during the

19th century or subsequently. What is conveniently forgotten by him is that such counts of handlooms could have been faulty or that even otherwise, little is revealed thereby regarding levels of output and employment - unless further information is also there as to the degree of their capacity utilisation. The Fact Finding Committee's Report of 1942 did anticipate such misuse of data and warned against "the futility of counting the number of looms as an index of the condition of the weaving industry" [ibid, p.33_7.

ESTIMATED TOTAL YARN SUPPLY TO INDIAN HANDLOOMS



Underlying Assumptions: Yield of Cotton Lint Per Acre

Quinquennium	I	92 lbs
do	II, III, V, VI & VII	87 lbs
do	IV	80 lbs
do	VIII & IX	84 lbs

Table 1

British India's Trade Statistics for Raw Cotton and Cotton Textiles By Value : 1848/9 to 1866/7

Year Ending 30 April	Export (£ m)		Import (£ m)		
	Raw Cotton	Cotton Goods and Yarn	Yarn	Cotton Goods	Total
1849	1.8	0.7	0.9	2.2	3.1
1850	2.2	0.7	1.1	3.4	4.5
1851	3.5	0.7	1.0	3.6	4.6
1852	3.6	0.8	1.4	4.8	6.2
1853	3.6	0.9	1.1	3.7	4.8
1854	2.8	0.8	1.3	4.4	5.7
1855	2.4	0.8	1.3	5.4	6.7
1856	3.3	0.8	1.4	4.9	6.3
1857	4.4	0.9	1.2	4.9	6.1
1858	4.3	0.8	0.9	4.8	5.7
1859	4.1	0.8	1.7	8.1	9.8
1860	5.6	0.8	2.0	8.6	11.6
1861	7.3	0.8	1.7	9.3	11.0
1862	10.2	0.7	1.5	8.8	10.3
1863	18.8	0.8	1.3	8.4	9.7
1864	35.9	1.1	1.5	10.4	11.9
1865	37.6	1.0	2.2	11.0	13.2
1866	35.6	1.7	2.0	11.8	13.8
1867	16.5	1.1	2.6	12.5	15.1

Sources : Compiled from Statistical Abstract Relating to British India : 1840-1865 / HC, vol. 72, No. 03817 : 1867 / and Dutt : 1870, II - pp.116-7, 249-52.

Table 2

India's Raw Cotton Exports and Yarn Imports 1857/8 to 1866/7

Year	Raw Cotton Export		Yarn Import	
	Quantity (m. lbs)	Value (pence per lb)*	Quantity (m. lbs)	Value (£ m)
1847/8	160.0	-	-	-
1857/8	260.3	3.9	17.7	0.94
1858/9	217.9	4.5	31.1	1.71
1859/60	345.9	3.9	31.5	2.05
1860/1	381.5(100)	4.6(100)	20.6	1.75
1861/2	395.1	6.2	23.6	1.47
1862/3	473.7	9.5(206)	19.5	1.27
1863/4	550.1(144)	15.6(339)	19.6	1.53
1864/5	525.0(138)	17.1(370)	17.9	2.20
1865/6	803.1(210)	10.6(230)	16.9	1.96
1866/7	425.6(112)	9.3(202)	30.9	2.53

* Derived from declared total values.

Figures in brackets are index numbers.

Source : For Yarn imports, Statistical Tables Relating to British India : 5th Issue [GI : 1881, pp. 138-9].

For raw cotton export figure of 1847/8, PP/ Accounts and Papers/1852/3, XCIX/13, p.604 [cited in Borpujari : 1969, p.223] and for the other years, Statement Exhibiting the Moral and Material Progress of India during the India 1874-75

[HC, vol. 56, No. 406 : 1876, p.75].

Table 3

British Piecegoods and Yarn Exports : Quantities for East India : Select Years 1830 to 1870

Year	Piecegoods (m. yards)		Yarn (m. lbs)	
		Index		Index
1830	58.9	( )	4.7	(100)
1839	100.00		10.8	
1840	145.1		16.1	
1845	229.3		16.3	
1850	314.4		21.0	
1855	499.7		28.7	
1856	477.9		25.2	
1857	469.9		20.0	
1858	791.6		36.8	
1859	968.2		44.0	
1860	825.1	(1400)	30.7	(653)
1861	797.8	(1354)	24.8	(528)
1865	561.1	(954)	15.2	(323)
1870	923.3	(1567)	31.0	(660)

Sources : For 1830 and 1839, Desai : 1971, Table 1 and 2, pp.346-9; for 1840, 1850 and 1870, Ellison : 1968, p.63; for 1845, 1856 and 1865, Sandberg : 1968, p,18; for 1861, Harnetty: 1965, p.345.

Combined data for piecegoods and yarn exports to East India and China for the years 1855 to 1861 are available in Helm : 1869, pp. 428-37 and/those to China only for the years 1855 to 1860 are available in Sykes: 1862, pp. 3-19. For these latter years, our relevant figures are derived from these two sources. /for

East India was a slightly wider area than India as such.

TABLE 4

India's Raw Cotton Account (in m.lbs)

Average Year Quinquennium Ending	Acreage (m.units)	Gross out-put	Wastage and Leakage	Export	Import	Approxi-mate Con-sumption of Spin-ning Mills	Total Avail-able Residue
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
I	1852/3	9.0	828.0	82.8	215.5	Nil	0.8	528.9
II	69/70	12.6	1096.2	109.6	619.0	5.7	28.0	345.3
III	74/5	12.5	1087.5	108.8	602.4	2.1	42.4	336.0
IV	79/80	12.1	968.0	96.8	446.7	5.9	95.1	335.3
V	84/5	14.9	1296.3	129.6	613.4	5.7	189.8	369.2
VI	89/90	15.3	1331.3	133.1	596.9	8.2	317.8	291.6
VII	94/5	15.6	1357.2	135.7	522.0	10.0	476.7	232.8
VIII	99/1900	15.2	1276.8	127.7	536.9	10.0	574.3	47.9
IX	1904/05	17.5	1470.0	147.0	647.6	13.1	651.9	36.6

Assumptions : Per-acre gross yield, on the average, is assumed at 92 lbs of clean cotton for Quinquennium I; xxxxxxx80 lbs for IV; 84 lbs for VIII and IX, and 87 lbs for the rest. The combined rate of wastage and leakage into other uses is assumed, rather arbitrarily, at 10 per cent. For arguments underlying these assumptions, refer to the text. Quinquenniums IV, VIII and IX were disturbed severely by natural calamities.

Note : For details and sources, see the Appendix.

4,
e
rs
put
ics
nd
2,
an
ols
al
e)

r
arn
how
one
arn

output and in 1875 about 42 per cent were consumed by machinelooms. [Mehta : 1954, p.41]. According to another source, out of 272 m. lbs of yarn spun by mills (of Bombay?), 38 per cent only was self-consumed [Wacha : 1892, pp. i-v]. It is on the basis of such stray information, as well as, spindlage-loomage ratios that our estimates of yarn input of machinelooms have

Table 5

A : India's Yarn Account (in m. lbs)

Average Years Quinquennium Ending		Domestic Machinespun	Estimated Use-wise Breakdown of Domestic Machinespun			Import (All used by Handlooms)	Net Available Machinespun supply to Handlooms (col.4+col.5)	Potential Maximum Supply of Handspun	Likely Supply of Handspun to Handlooms (assuming one per cent leakage)
			Export	Consumed by Machinelooms	Consumed by Handlooms				
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
I	1852/3	0.7*	Nil	Nil	0.7	21.0	21.7	497.2	492
II	69/70	23.5	0.8	11.8	10.9	26.9	37.8	324.6	321
III	74/5	35.6	2.2	14.2	19.2	33.5	52.7	315.8	313
IV	79/80	79.9	15.4	40.0	24.5	33.5	58.0	315.2	312
V	84/5	159.4	43.8	79.7	35.9	44.3	80.2	347.0	343
VI	89/90	266.9	110.9	106.8	49.2	49.1	98.3	274.1	271
VII	94/5	400.4	162.5	120.1	117.8	44.8	162.6	218.8	217
VIII	99/1900	474.6	208.1	83.5	183.0	48.6	231.6	45.0	44
IX	1904/5	531.8	239.8	113.4	178.6	33.1	211.7	34.4	34

3: India's Domestic Mill Cloth Production (in m. lbs.)

Quinquennium :	I	II	III	IV	V	VI	VII	VIII	IX
Mill Cloth :	Nil	13.2	15.9	44.7	89.3	119.6	134.5	93.5	127.0

Notes : For machinespun yarn, domestically produced or imported during Quinquennium I, we have taken the yarn production figure given for the late 1830s by H. Gouger [H C, vol.8, No. 527 : 1840, pp.116-7] and the yarn import figure available for the single year 1850, [Ellison : 1968, p.63], for the relevant averages.

Table 5 B is derived from col. 3 of Table 5 A, inflating the yarn input figures 12 per cent on account of the extra weight gained from sizing.

Table 5 (Contd.) : Notes

Col 1 yarn figures are derived from Col 6 of Table 4, assuming a 16 per cent machine-spinning wastage rate for Quinquenniums II to VII. For the last four years of Quinquennium VIII, the actual weight of yarn output is available, from Financial and Commercial Statistics for British India, 9th issue [GI : 1902, p.306] and Report of the Fact Finding Committee.... [GI : 1942, p.8]. For Quinquennium IX, our source is the Indian Tariff Board [GI : 1934, II-Table 11A, p.272]. Cols 2 and 5 export/import figures are from usual official sources, such as, Annual Statement of the (Sea-borne) Trade..... [GI : 1871/2 onward].

Col 7 figures are derived from Col 7 of Table 4, assuming a 6 per cent hand-spinning wastage rate.

Col 8 figures are derived from Col 7, assuming one per cent leakage of yarn into other uses.

Cols 3 and 4 : No official figures are available for the years 1865/6 to 1895/6, as to how much of the yarn produced by the Indian mills was self-consumed and how much was sold to the handloom sector. According to one source, in or about 1869, over 50 per cent of the yarn output and in 1875 about 42 per cent were consumed by machinelooms. [Mehta : 1954, p.41]. According to another source, out of 272 m. lbs of yarn spun by mills (of Bombay?), 38 per cent only was self-consumed [Wacha : 1892, pp. i-v]. It is on the basis of such stray information, as well as, spindlage-loomage ratios that our estimates of yarn input of machinelooms have

Table 5 : Notes (Contd).

been made : - 50 per cent of the relevant figures of Col I for Quinquenniums II, IV and V; 40 per cent for Quinquenniums III and VI, and 30 per cent for Quinquennium VII. In Quinquenniums VIII and IX, respectively, only 18 and 21 per cent of Indian mill yarn output were self-consumed, as can be worked out from the actual figures of mill consumption of yarn published officially [GI : 1902, p.306; GI : 1942, p.8 and GI : 1934, II - Table IIB, p.273]. Once we know how much was exported and how much was consumed by Indian machinelooms, we can find out how much went to the handlooms. This is shown in Col 4.

Table 6

India's Cloth Production and Consumption (in m.yds.)

Average Year: Quinquennium Ending		Mill Cloth Production	Mill Cloth Export	Mill Cloth Retained for Consumption (col.1-col.2)	Handloom Cloth from Machine-spun	Handloom Cloth from Handspun	Total Handloom Cloth Production	Import of Foreign Cloth	Overall Consumption of Cloth (col.3+col.6+col.7)
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
I	1852/3	Nil	Nil	Nil	86.8	1722.0	1808.8	314.4	2123.2
II	69/70	56.4	-	56.4	151.2	1123.5	1274.7	806.5	2137.6
III	74/5	67.9	12.5	55.4	210.8	1095.5	1306.3	1003.8	2365.5
IV	79/80	191.3	19.3	171.6	232.0	1092.0	1324.0	1238.6	2734.6
V	84/5	381.3	41.1	340.2	320.8	1200.5	1521.3	1700.8	3562.3
VI	89/90	510.7	60.8	449.9	393.2	948.5	1341.7	1972.4	3764.0
VII	94/5	574.3	75.8	498.5	650.4	759.5	1409.9	2019.0	3927.4
VIII	99/1900	399.2	71.9	327.3	926.4	154.0	1080.4	2004.6	3412.3
IX	1904/5	542.3	74.9	469.5	846.8	119.0	965.8	2124.5	3559.8

Notes : Yardage of mill production is derived from relevant figures in Table 5 B, assuming that a pound of mill cloth contains 4.27 yards.

In the case of estimating the yardage of handloom cloth, the assumption is that one pound of machinespun yarn yields 4 yards; and of handspun, 3.5 yards. Calculations are made from relevant data in Table 5 A, except for Quinquennium IX, col.4. The figure for the latter is based on the Indian Tariff Board data [GI: 1934, II-Table 11 B], after correcting an obvious misprint. Import and export figures are from usual official sources, [GI: 1871/2 onward], except in the case of Quinquennium I for which we have taken the figure for the single year 1850, as given by Ellison : 1968, p.63.

Cloth exports from India are assumed here to be all mill cloth, though these included quantities of handloom cloth as well.

Table 7

India's Per Capita Cloth Consumption (in yards)

Average Year Quinquennium Ending	Population Mear year (million)	Mill cloth Retained for Consumption	Handloom Cloth		Imported cloth	Overall Consumption
			Woven from Machinespun	Woven from Handspun		
	(1)	(2)	(3)	(4)	(5)	(6)
I 1852/3	237.4	Nil	0.37	7.25	1.32	8.94
II 69/70	252.4	0.22	0.60	4.45	3.19	8.47
III 74/5	255.6	0.22	0.82	4.29	3.93	9.25
IV 79/80	256.7	0.67	0.90	4.25	4.82	10.65
V 84/5	262.2	1.30	1.22	4.58	6.49	13.59
VI 89/90	274.5	1.64	1.43	3.46	7.19	13.72
VII 94/5	282.8	1.76	2.30	2.69	7.14	13.89
VIII 99/1900	284.3	1.15	3.26	0.54	7.05	12.00
IX 1904/5	288.7	1.63	2.93	0.41	7.36	12.33

Note : Population figures are taken, for the sake of convenience, from the Kingsley Davis series, projected backward, assuming an annual growth rate of 0.3619 per cent during the decades 1851-60 and 1861-70, as M.D. Morris has worked out in IESHR, Vol.11, [Morris : 1974, pp.309-12]. Any other series also could be tried to ascertain the trend in per capita consumption over time.

See our Table 6 for the rest of necessary basic data, from which the per capita figures have been worked out.

Table 8

An Alternative Exercise : Assuming A Constant Yield of 84 lbs of Lint Cotton per Acre under Cotton

Quinquennium Ending		Cotton Yarn Available to Indian Handlooms (m. lbs)		
		(1) Machinespun (annual average)	(2) Handspun (annual average)	(3) Total
I	1852/3	21.7	431.9	433.6
II	69/70	37.8	286.8	324.6
III	74/5	52.7	283.8	336.5
IV	79/80	58.0	347.9*	405.9*
V	84/5	80.2	309.7	389.9
VI	89/90	98.3	233.0	331.3
VII	94/5	162.6	175.7	338.3
VIII	99/1901	231.6	44.0	275.6
IX	1904/5	211.7	34.0	245.7

*Unrealistically on the higher side [See Table 5A].

Note : The net available machinespun supply to handlooms in this Table remains the same as in Table 5A, but the/of handspun, except for the last two quinquen-/supply niums, does not. The lower assumption of per-acre cotton yield in the case of quinquenniums I to III, as well as, V to VII results in lower corresponding figures; and the higher assumption in the case of, Quinquennium IV, to an unrealistically higher figure. The total yarn input, as shown in Col 3, is therefore affected accordingly. Nevertheless, the overall declining trend remains unaltered. Tables 4 and 5, together, show how we have made our calculations.

Table 9

Index No. (Unweighted) of Average Prices : Raw Cotton and Yarn : 1861-1906

Year	Bombay Export Articles		Year	Bombay Export Articles	
	Raw Cotton (Broach)	Mill Yarn (20s)		Raw Cotton (Broach)	Mill Yarn (20s)
1873	100	—	1890	91	73
1874	82	100	1891	84	69
1875	80	81	1892	75	66
1876	75	80	1893	93	75
1877	82	86	1894	84	71
1878	81	79	1895	79	69
1979	86	74	1896	85	75
1880	98	84	1897	77	73
1881	95	85	1898	68	61
1882	90	78	1899	59	52
1883	77	74	1900	85	61
1884	85	72	1901	84	67
1885	90	71	1902	83	66
1886	84	72	1903	81	67
1887	85	71	1904	97	77
1888	95	78	1905	85	81
1889	92	79	1906	85	75

With 1873 as the base year, the index numbers for raw cotton prices for the preceding years were as follows :

Year	1861	62	63	64	65	66	67	68	69	70	71	72
Index	55	81	144	229	134	160	106	75	96	118	78	95

Source : Index Numbers of Indian Prices 1861-1918 (GI, Department of Statistics, Calcutta, 1919) - Table VI, p.12.

Appendix (Contd.)

		(1)	(2)
	77/8	109.47	9523.9
	78/9	121.73	10590.5
	79/80	126.85	11035.9
	IV Average	120.35	10513.76
	1880/1	132.91	11563.2
	81/2	151.95	13219.6
	82/3	161.07	14013.1
	83/4	156.26	13594.6
	84/5	145.36	12646.3
	V Average	149.51	13007.36
	1885/6	149.44	13001.3
	86/7	156.34	13601.6
	87/8	154.72	13460.6
	88/9	153.09	13318.8
	89/90	151.49	13179.6
	VI Average	153.02	13312.38
I	1890/1	149.85	13036.9
	91/2	149.85	13036.9
	92/3	146.55	12749.8
	93/4	169.08	14710.0
	94/5	163.44	14219.3
	VII Average	155.75	13550.58
II	1895/6	161.25	14028.7
	96/7	162.46	14134.0
	97/8	154.50	13441.5
	98/9	155.63	13539.8
	99/1900	126.16	10975.9
	VIII Average	152.00	13223.98
	1900/1	154.95	13480.6
III	01/02	156.67	13630.3
	02/03	172.72	15026.6
	03/04	187.22	16288.1
	05/05	203.55	17708.8
	IX Average	175.02	15226.88

Discrepancies between diverse sources, being ~~unnecessary~~ slight if any, are overlooked.

APPENDIX

India's Raw Cotton Account : 1848/9 to 1904/5 [Assuming 87 lbs as per-acre constant yield of clean cotton]

Year	Acreage under Cotton (lakh lbs) (1)	Gross Output (lakh lbs) (2)	Wastage/ leakage at 10% of Col(2) (lakh lbs) (3)	Import (lakh lbs) (4)	Export (lakh lbs) (5)	Approximate quantity consumed by domestic mills (lakh lbs) (6)	Residual supply available to ~~stockist~~ spinners (Col 2-Col 3 +Col 4-Col 5 -Col 6) (lakh lbs) (7)
1848/9					1690.0		
49/50					1656.0		
50/1					2265.0		
51/2					2536.0		
52/3					2629.0		
I Average	90.0	7830.0	783.0	Nil	2155.0	8.3	4883.7
1865/6				111.7	8031.0		
66/7				n.a.	4256.0		
67/8				35.1	6141.0		
68/9				34.5	6976.0		
69/70				47.7	5548.0		
II Average	125.60	10927.2	1092.7	57.2	6190.4	280.0	3421.35
1870/1	109.17	9497.79	949.78	35.6	5776.0	348.0	2459.61
71/2	119.35	10383.45	1038.34	2.2	8092.5	347.74	907.07
72/3	129.52	11268.24	1126.82	34.2	4942.1	347.40	4886.13
73/4	133.52	11616.24	1161.62	16.4	5036.6	404.74	5029.63
74/5	135.20	11762.40	1176.24	17.6	6272.1	670.22	3661.44
III Average	125.35	10905.62	1090.56	21.2	6023.86	423.60	3388.80
1875/6	137.33	11947.7	1194.8	28.3	5610.9	742.6	4427.7
76/7	108.86	9470.8	947.1	44.8	5104.9	836.0	2627.6

Contd....2/

Appendix (Contd.)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
77/8	109.47	9523.9	952.4	60.7	3874.2	924.0	3834.0
78/9	121.73	10590.5	1059.0	73.4	3322.0	1048.9	5234.0
79/80	126.85	11035.9	1103.6	86.5	4422.3	1205.9	4390.6
IV Average	120.35	10513.76	1051.38	58.74	4466.86	951.5	4102.78
1880/1	132.91	11563.2	1156.3	63.7	5086.5	1485.6	3898.5
81/2	151.95	13219.6	1322.0	46.6	6302.7	1558.4	4083.1
82/3	161.07	14013.1	1401.3	45.3	6908.5	1789.7	3958.9
83/4	156.26	13594.6	1359.5	53.8	6697.0	2318.2	3273.7
84/5	145.36	12646.3	1264.6	76.2	5673.9	2339.3	3444.7
V Average	149.51	13007.36	1300.74	57.12	6133.72	1898.2	3731.78
1885/6	149.44	13001.3	1300.1	84.9	4692.5	2521.4	4572.2
86/7	156.34	13601.6	1360.2	63.9	6084.6	2817.0	3373.7
87/8	154.72	13460.6	1346.1	61.2	6019.5	3085.0	3071.2
88/9	153.09	13318.8	1331.9	72.4	5971.3	3483.5	2604.5
89/90	151.49	13179.6	1318.0	129.9	7078.8	3953.2	959.5
VI Average	153.02	13312.38	1331.26	82.46	5969.34	3178.0	2916.22
1890/1	149.85	13036.9	1303.7	94.3	6623.6	4621.3	582.6
91/2	149.85	13036.9	1303.7	91.0	4955.9	4570.5	2297.8
92/3	146.55	12749.8	1275.0	120.4	5363.9	4590.4	1640.9
93/4	169.08	14710.0	1471.0	105.8	5363.6	4792.2	3189.0
94/5	163.44	14219.3	1421.9	87.3	3790.9	5259.5	3834.3
VII Average	155.75	13550.58	1355.06	99.3	5219.58	4766.8	2308.92
1895/6	161.25	14028.7	1402.9	131.5	5878.2	5524.5	1354.6
96/7	162.46	14134.0	1413.4	63.9	5841.9	5099.7	1842.9
97/8	154.50	13441.5	1344.1	51.8	4169.2	5806.8	2173.2
98/9	155.63	13539.8	1354.0	41.9	6060.3	6566.7	(-) 399.3
99/1900	126.16	10975.9	1097.6	211.4	4894.4	5716.7	(-) 521.4
VIII Average	152.00	13223.98	1322.4	100.1	5368.8	5742.9	890.0
1900/1	154.95	13480.6	1348.1	252.1	4004.8	5298.8	2081.1
01/02	156.67	13630.3	1363.0	87.9	6384.0	6918.9	(-) 947.7
02/03	172.72	15026.5	1502.7	75.6	6770.2	6791.1	38.2
03/04	187.22	16288.1	1628.8	20.5	8882.8	6839.5	(-) 1042.5
05/05	203.55	17708.8	1770.9	215.7	6336.7	6749.0	3067.9
IX Average	175.02	15226.88	1522.7	130.38	6475.7	6519.5	839.4

Apperdix (Contd.) : Notes

(1) For the logic and calculations providing the basis of our estimated acreage figures, refer to our Artha Vijnana paper [Guha : 1973, pp.1-56]. All these estimates are based on official figures duly adjusted by us for spatial coverage gaps. For the quinquenniums 1848/9 to 1852/3 and 1865/6 to 1869/70, stray official figures with partial coverage only are available and those, too, for not all the relevant years. Nevertheless, we believe, our relevant estimates are fairly realistic. The time series for the years 1874/5 to 1886/7 and 1891/2 to 1904/5, are on a firmer basis. Figures for the years 1870/1 to 1873/4 are obtained by way of extrapolation and those for 1887/8 to 1890/1 by way of interpolation. The average cotton acreage estimated at 8.6 million acres per Quinquennium I in our 1973 paper has been revised to 9 million acres.

(2) Export and import figures are collated from the following sources - P.P. Accounts and Papers/1852-53 XCIX/13, p.604 [Borpujari : 1969, p.223] and Sykes : 1856, p.116 for the years 1848/9 to 1852/3. For the rest up to 1904/5, Statement Exhibiting the Moral and Material Progress of India during 1874-75, HC Vol 56, No.406, p.75; Harnetty : 1971, pp.414-29; Statistical Tables for British India, 5th Issue [GI : 1881] as well as 8th Issue [GI : 1884] and Annual Statement of The (Sea-Borne) Trade... [GI : 1871/2 onward]. Discrepancies between diverse sources, being ~~extremely~~ slight if any, are overlooked.

(3) Data on approximate quantities of raw cotton consumed by Indian mills are available from 1878/9 to 1903/4 in the Report of the Bombay Mill Owners' Association for the [BMOA : 1904_7. For the average of 1865/6 to 1869/70 and for the single year 1870/1 [Ellison : 1968, pp.324 and 104_7. For the years 1873/4 to 1877/8, all-India estimates are worked out on a pro-rata basis from the corresponding Bombay Presidency figures given in the 1904 source. Since in the matter of number of spindles installed and/or quantity of raw cotton consumed, the ratio between the Bombay Presidency and all-India is observable from year to year, estimates could be made for other years as well. The average annual consumption figure for 1848/9 to 1852/3 is estimated on the basis of relevant information in H. Gouger's evidence, referred to in notes under our Table 5.

(4) Wadding, upholstery etc. consume up a lot of cotton. There is also large wastage in course of storing and transportation. All this is taken care of in Col.3 by assuming a 10 per cent wastage/leakage rate, as discussed in the text.

Bibliography

I BRITISH PARLIAMENTARY PAPERS (House of Commons).

HC Vol 8 No.171 : 1812/3 : East India Affairs Trade Private Extracts from Reports on External Commerce in Bengal from 1795 , House of Commons, London, 30 April 1813.

HC Vol 6 No.746 : 1821 : Third Report from The Select Committee of House of Commons on Foreign Trade, London, 10 July.

HC Vol 8 No.527 : 1840 : Report from The Select Committee on East India Produce together with Minutes and Evidence An Appendix and Index, House of Commons, London, 21 July.

HC Vol 9 No.511 : 1848 : Report from the Select Committee on The Growth of Cotton in India together with The Minutes of Evidence, Appendix and Index, House of Commons, London, 17 July.

HC Vol 50 No.172 : 1873 : East India (Progress and Conditions) — Statement Exhibiting The Moral and Material Progress and Conditions of India during 1871-72, House of Commons, London, 28 April.

HC Vol 56 No.406 : 1876 : East India (Progress and Conditions) - Statement Exhibiting the Moral and Material Progress of India during 1874-75, House of Commons, London, 7 August 1875.

HC Vol 72 No.C.3817 : 1867 : Statistical Abstract Relating to British India from 1840 to 1865, London.

II DOCUMENTARY AND STATISTICAL PUBLICATION IN INDIA/Pakistan

GI, 1919 : Index Numbers of Indian Prices, Department of Statistics, GI, Calcutta.

GI : 1871/2 onward, : Annual Statement of The (Sea-borne) Trade (and Navigation) of British India with Foreign Countries - Monthly Trade Returns, Calcutta. Serial.

GI : 1881 : Finance and Commerce Department (Statistical Branch) - Statistical Tables for British India, 5th Issue, Calcutta.

GI : 1884 : Finance and Commerce Department (Statistical Branch) - Statistical Tables for British India, 8th Issue, Calcutta.

GI : 1888 : Finance and Commerce Department (Statistical Branch) - Statistical Tables for British India, 13th Issue, Calcutta.

GI : 1902 : Finance and Commerce Department (Statistical Branch) - The Financial and Commercial Statistics of British India, 9th Issue, Calcutta.

GI : 1942 : Report of The Fact Finding Committee (Handloom and Mills), Delhi.

-- : 1954 : Report of the Textile Enquiry Committee, Vol.I, Delhi.

GI : 1934 : Indian Tariff Board, Cotton Textile Industry, Vol.2

GNWP : 1864 : The Selections from the Government of the North Western Provinces, Vol.40, Allahabad, containing "Information regarding the slackness of demand for European Goods", pp.116-46.

Govt. of Pakistan, 1956, : Report of The Fact Finding Committee on Handlooms, Karachi.

J.G. Cumming, 1908 : Review of The Industrial Position and Prospects in Bengal in 1908 with Special Reference to The Industrial Survey of 1890, Calcutta.

BMOA, 1904 : Report of the Bombay Mill Owners' Association for the year 1904, Bombay.

C.E. Trevelyan. 1835 : Report upon The Inland Customs and Town Duties of The Bengal Presidency, (first edn, 1834), Calcutta.

III BOOKS AND UNPUBLISHED THESES

N.N. Banerjei 1898 : Monograph on The Cotton Fabrics of Bengal, Bengal Secretarial Press, Calcutta.

C.A. Bayly, 1983 : Rulers, Townsmen and Baazars North Indian Society in the Age of British Expansion 1770-1870, Cambridge University Press.

G. Blyn, 1966 : Agricultural Trends in India 1891-1947 : Output, Availibility and Productivity, University of Pennsylvania Press, Philadelphia.

J.G. Borpujari, 1969 : The British Impact on The Indian Cotton Textile Industry 1757-1865 (Unpublished Ph.D Dissertation), Cambridge University.

F. Braudel, 1984 : (French edn 1979) Civilisation and Capitalism 15th-18th Century, Vol III : The Perspective of The World, English trans., London.

George Blyn, 1966 : Agricultural Trends in India 1891-1947 : Output, Availability and Productivity, Philadelphia.

K.N. Chaudhuri 1978 : The Trading World of Asia and the English East India Company 1660-1760, Cambridge University Press.

Kingsley Davis, 1951 : The Population of India and Pakistan, Princeton.

J.A. Dubois, 1897 : (Original French edn 1823), Hindu Manners, Customs and Ceremonies, English Trans., Oxford.

Romesh Dutt, 1970 : reprint (1st Indian edn 1960; 1st edn 1904, 2nd 1906), The Economic History of India Volume One Under Early British Rule 1757-1837, Publications Division, GOI, New Delhi.

---- , 1970 : reprint (1st Indian edn 1960; 1st edn 1904, 2nd 1906), The Economic History of India Volume Two In The Victorian Age 1837-1900, Publications Division, GI, New Delhi.

T. Ellison, 1968 : reprint (1886 edn), The Cotton Trade of Great Britain, London.

Holden Furber, 1970 : reprint (1st edn 1948), John Company At Work A Study of European Expansion in India in The Late Eighteenth Century, Octagon Books, New York.

D.R. Gadgil, 1973 : reprint (5th edn 1971, 1st edn 1924), The Industrial Evolution of India in Recent Times 1860-1939, Oxford University Press.

H.R. Ghosal, 1966 : (1st edn.1950), Economic Transition in The Bengal Presidency : 1793-1833, Calcutta.

H.R. Gupta, 1987 : (1st edn 1943), Panjab, Central Asia and the First Afghan War, Panjab University, Chandigarh.

R.K. Gupta, 1984 : The Economic Life of A Bengal District Birbhum 1770-1857, University of Burdwan.

H. Hossain, 1988 : The Company Weavers of Bengal : The East India Company and the Organisation of Textile Production in Bengal 1750-1813, Oxford University Press, Delhi.

S.D. Mehta, 1954 : The Cotton Mills of India 1854 to 1954, The Textile Association of India, Bombay.

I. D. Parshad, 1932 : Some Aspects of India's Foreign Trade 1757-1893, London.

K.W. Porter, 1937 : The Jacksons and the Lees : Two Generations of Massachussets Merchants 1766-1844, Volume I-II, Harvard Univeristy Press.

S.V. Puntambekar and N.S. Varadachari, 1926 : Handspinning and Handweaving, All India, Spinners Association, Ahmedabad..

A.S. Raju, 1941 : Economic Conditions in the Madras Presidency 1800-1850, University of Madras.

R. Robson, 1957 : The Cotton Industry of Britain, Macmillan, London.

J.C. Sinha, 1927 : Economic Annals of Bengal, Macmillan, London.

N.K. Sinha 1965 : (1st edn 1956, 2nd 1961), The Economic History of Bengal from Plassey to The Permanent Settlement Volume I, Firma K.L., Calcutta.

N.K. Sinha, 1970 : The Economic History of Bengal 1793-1848 Volume III, Firma K.L., Calcutta.

M. Steven, 1965 : Merchant Campbell 1769-1846 A Study of Colonial Trade, Melbourne.

S. Sivasubramonian, 1965 : National Income of India 1900-1 to 1946-47, Delhi School of Economics (Mimeographed).

J. Taylor, 1851 : A Descriptive and Historical Account of the Cotton Manufacture of Dacca by A Former Resident of Dacca, London.

A. Tripathi, 1979 : (1st edn 1956), Trade and Finance in the Bengal Presidency 1793-1833, Oxford University Press, Calcutta.

G. Watt, 1890 : A Dictionary of The Economic Products of India, Vol 4, London/Calcutta.

IV CONTRIBUTIONS TO PERIODICALS AND COMPOSITE VOLUMES

A. K. Bagchi, 1979 : "A reply" The Indian Economic and Social History Review, Vol 16, April-June, pp.147-61.

J.G. Borpujari, 1973 : "Indian cottons and the cotton famine 1860-65", The Indian Economic and Social History Review, Vol.10, March, pp.37-49.

---- , 1973 : "The impact of the transit duty system in British India", The Indian and Social History Review, Vol 10, September, pp.218-43.

I. D. Derbyshire, 1987 : "Economic change and the railways in North India" Modern Asian Studies, Vol 21, Pt 3, July, pp. 521-47.

M. Desai, 1971 : "Demand for cotton textiles in nineteenth century India", The Indian Economic and Social History Review, Vol. 8, December, pp.337-61.

A. Feuerwerker, 1970 : "Handicraft and manufactured cotton textiles in China 1871-1910", The Journal of Economic History, Vol.30, pp.338-78.

D.R. Gadgil, 1955 : "Indian economic organisation " in S. Kuznets el et, Economic Growth : Brazil, India, Japan, Duke University Press, Durham N.C. 1955, pp.448-63.

Amalendu Guha, 1973 : "Growth of acreage under raw cotton 1851-1901 a quantitative account", Artha Vijanana, Vol.15, March, pp.1-56.

---- , 1972 : "Raw cotton of western India : output, transportation and marketing 1750-1850", The Indian Economic and Social History Review, Vol.9, March, pp.1-33.

---- , 1984 : "More about the Parsi Seths : their roots, entrepreneurship and comprador role 1650-1918", pp.109-50, in D. Tripathi, ed., Business Communities of India A Historical Perspective, Manohar Publications, New Delhi.

Irfan Habib, 1985 : "Studying a colonial economy without perceiving colonialism", Modern Asian Studies, Vol.19, pp.355-81.

P. Harnetty, 1965 : "The imperialism of Free trade : Lancashire and the Indian cotton duties 1859-62", Economic History Review 2nd series, Vol.18, pp.333-49.

P. Harnetty, 1971 : "Cotton exports and Indian agriculture 1861-70", Economic History Review, 2nd Series, Vol.24, August, pp.414-29.

E. Helm, 1869 : "The cotton trade of the United Kingdom during the seven years 1855-68 as compared with the seven years 1855-61 with remarks on the return of factories existing in 1868", Journal of the Statistical Society of London Vol.32, pp.428-37.

M. D. Morris, 1974 : "The population of all-India 1800-1951", The Indian Economic and Social History Review, Vol.11, June-September, pp.309-12.

------- , 1963 : "Towards a reinterpretation of nineteenth century Indian economic history", Journal of Economic History, Vol.23, December.

M.B. Namjosi, 1892 : "Necessity to establishing native agencies abroad", pp.I-V, Second Industrial Conference Printed Proceedings, Poona.

Om Prakash, 1976 : "Bullion for goods : international trade and the economy of early eighteenth century Bengal", The Indian Economic and Social History Review, Vol.13, April-June, 159-87.

L.G. Sandberg, 1968 : "Movements in the quality of British cotton textile exports 1815-1913", The Journal of Economic History, Vol.28, March, pp.1-27.

A. Slaven , 1969 : "A Glasgow firm in the Indian market: John Lean and Sons, muslin weavers", Business History Review, Vol.43, pp.496-522.

K. Specker , 1989 : "Madras handlooms in the nineteenth century", The Indian Economic and Social History Review, Vol.26, April-June, pp.131-66.

Col.W.H. Sykes, 1862 : "Notes on the progress of the trade of England with China since 1833 and its present condition and prospects", Journal of The Statistical Society of London, Vol. 25, pp. 3-19.

----- . , 1856 : Journal of The Statistical Society of London, Vol.19, pp.107-26.

M.J. Twomey, 1983 : "Employment in nineteenth century Indian Textiles", Explorations in Economic History, Vol.20, pp.37-57.

R. Valpy, 1860 : "On the recent and rapid progress of British trade with India", Journal of the Statistical Society of London, Vol.23, pp.66-75.

M. Vicziany, 1979 : "Bombay merchants and structural changes in the export community 1850 to 1880", in K.N. Chaudhuri and C.J. Dewey, ed., Economy and Society : Essays in Indian Economic and Social History, Oxford University Press, Delhi, pp.163-96.

D.E. Wacha, 1892 : "The cotton industry", pp. i-x, Second Industrial Conference Printed Proceedings, Poona.

INCLUDED IN D. Kumar, ed, 1983 : The Cambridge Economic History of India's Volume 2 : c.1757-c.1970, Cambridge University Press, London.

V.D. Divekar, 1983 : "Western India", C.HI, pp.332-51.

D. Kumar, 1983 : "South India", CEHI, pp.352-75.

K.N. Chaudhuri, 1983 : "Foreign trade and balance of payments 1757-1947", CEHI, pp.804-77.

T.G. Kessinger, 1983 : "North India", CEHI, pp.242-69.

MISCELLANEOUS

Indian Economist /R. Knight, ed., periodical, Calcutta/later Bombay. Started in 1869_7.