TEXTILE CRAFTS AND TRADE IN INDIA IN THE 16th AND 17th CENTURIES

ABSTRACT

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SUBMITTED FOR THE AWARD OF THE DEGREE OF
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BY
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ABSTRACT OF THESIS

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K.A.S.M. Ishrat Alam

The textile industry constituted the most important sector of Indian economy, after agriculture during the 16th and 17th centuries. Within pre-colonial India, different regions had become known for certain degree of specialization based on local supplies, income levels, inherited artisanal skills. Because of the importance of textile exports, much attention was paid in contemporary European commercial literature, especially in Dutch and English, to the different kinds of textiles, their production centres and various other aspects of textile manufacture. But there exists a significant amount of Persian and indigenous source material as well.

Modern authors, beginning with Moreland have depended heavily on the archives of the English East India Company (Factory Records) and the accounts of European travellers. Moreland also pioneered the scrutiny of the Dutch East India Company i.e. (V.O.C.) records, which are much richer than those of English Company. Hence it is not surprising that of late there has been an increasing tendency to tap Dutch sources. In a measure this thesis continues this tendency and much Dutch archival material, hitherto either not noticed or noticed for purposes other than textile history has been
utilised here. Simultaneously, Persian texts and indigenous sources have also been explored.

The present thesis comprises three broad sections viz. A. The Making of Textiles, B. Surface Treatment of Textiles, and C. Commercial Organization and Trade studied Regionally.

In the Section A, we have focussed broadly on the technology of the medieval textile craft. Obviously, strict lines in point of time are hard to lay down, and identification of particular tools or techniques as specifically medieval can only be attempted unless one looks at evidence from previous period of Indian history as well. On the other hand, certain medieval techniques can only be understood from more recent descriptions of the ‘traditional’ craft. Often our material here comes from the most miscellaneous sources, to be located in places where the description is often unintentional or incidental. Records have to be supplemented by products of graphic art (the Ajanta frescoes, Mughal miniatures and modern drawings). In addition to these, standard works on history of technology of Europe, Iran and China have been consulted, for purposes of comparison with other cultures and for descriptions and interpretations of the history of individual techniques and devices.

In the thesis an attempt is made to analyse the extent of influence of diffusion on Indian techniques as well as establish the techniques that show evidence of indigenous origins. The possibility is examined of pace and
quantum of particular technological change increasing in the medieval period (1200-1750). This has necessitated a scrutiny of ancient textile technology. We have found evidence to confirm Needham’s speculation that cotton gin was invented in India. Of similar indigenous origin has been the bow-string device for cotton-carding. On the other hand, we offer evidence that the spinning wheel arrived in India only in the fourteenth century, and that certain attachments, like its handle came only in the Mughal period. In weaving, the foot-pedals were introduced into the loom only in the fifteenth century. Vertical loom appeared by eleventh century AD. But the complex drawloom might have arrived possibly in the 13th century through Iran, but did not became common in Mughal India. Indian weavers could achieve patterns with simple looms by the ‘patola’ and jamdani techniques. In the process we have also dealt with the structural deficiencies of Indian horizontal loom. Shawl weaving and carpet weaving similarly were diffused in medieval times. Akbar took very keen interest in spreading them by opening imperial karkhanas in many places of the the Mughal empire. A weaving of carpet on vertical loom was subsequently introduced into the Southern India by the 16th century A.D.

In the second chapter attempt has been made to trace the history of sericulture in India. From our investigation of Sanskrit and Chinese sources we have found that sericulture was not practised in India in ancient times. It was practised in Kashmir and Bengal by the 15th century. Even as late as
16th century, Abul Fazl, informs us that eggs of silk worms were imported from Gilgit and Little Tibet. Abul Fazl also reports that Kumaun in the Himalaya also became familiar with sericulture. By 17th century it had reached Sind. So far southern India is concerned only some abortive efforts were made to introduce mulberry cultivation at Nagapatnam in the 17th century.

Besides Sericulture, we have also discussed the Saturnidae group of silks.

Our third chapter deals with wool production and felt-making; and the fourth chapter deals with hemp and preparation of sailcloth from hemp. We here discuss the need for distinguishing hemp from jute in our sources.

We begin our Section B, Surface Treatment of Textiles, with Chapter 5 dealing with ‘Dyes and Dyeing’. Indigo being the primary dyeing agent, we have devoted much space to its history and methods of preparation. The best indigo in India grew in the Bayana tract and second best in quality at Sarkhej near Ahmadabad. The accounts of Pelsaert, Finch, Mundy and Tavernier have enabled us to describe in fair detail the indigo manufacturing process in the northern indigo tract. Indigo vats were very important for producing indigo under “wet leaf” process. Archaeological finds indicate that the indigo vats were now a clearly medieval innovation. On the Sarkhej tract the accounts of Pieter van den Broeke, W. Geleynssen de Jongh and
Mattheus van Heck have helped us to see how the process of manufacture differed here from those of the Bayana tract.

Unlike northern India and western India, in peninsular India, indigo was produced in earthen pots and not indigo vats till as late as 17th century, a most curious continuance of an earlier inefficient technology clearly for want of capital. Another interesting method of indigo manufacture was reported by Joseph Salbancke (1609) who refers to “Dry Leaf Process.” He refers to use of boilers at Bayana, an early anticipation of later ‘plantation’ practice.

Chapter 6 deals with painting on cotton cloth. Hendrik Adrian van Rheede’s account (1688) is very helpful in explaining how the painting of cloth was undertaken.

Economically much more important was Cotton printing, discussed in chapter 7. Our evidence shows it was invented in China as early as second century A.D. and possibly from there it arrived in India by 9th–10th century A.D. During 16th–17th century India was a major producer of block print textiles.

In the eighth chapter we deal with embroidery techniques. Embroidery on wooden frame (karchob) was apparently a late comer.

Section C is concerned with production organisation, commerce, credit and trade. It deals with organization of production and trade. The regional studies that have appeared so far, important as they are, have been
largely confined to Gujarat, Coromandel and Bengal. The thesis takes account of this work and tries to survey regional features not yet fully studied. Thus Chapter 9 examines the relationship evolving between the V.O.C. and the artisans of South India on the basis of the V.O.C. records. We find that here textile manufacture was not undertaken by weavers alone as a domestic craft. We are told by our documents that a prominent group of merchants had turned to weaving, painting and printing cloth.

In the Chapter 10 we compare the relative position of Gujarat and Coromandel as two important exporting regions and the composition of their exports. We have tried to study the relative position of various items of textile trade within a host of commodities.

Chapter 11 deals with organization of commerce at Malda and the following one with organisation of commerce in Awadh, two important regions which were twin hinterlands of western and southern respectively exporting regions. They help us in understanding the organisation of production and trade in the hinterland, an aspect largely ignored by studies of seaborne commerce.

In the Conclusion, we relate technology to various forms of labour. The textile crafts were carried on mostly in villages upto the stage of spinning. Until the sixteenth century, spinners seem largely to have been confined to villages. However, this is not to suggest that spinners were not to be found in urban centres. The introduction of the spinning wheel (14th
century) possibly facilitated the rise of specialised spinners in towns along with their village based counterparts. Spinning was mainly pursued by women of both low as well as high castes, being a marked feature of the gender-division of labour. Women of Brahman castes spun yarn in Bengal and Bihar and presumably other parts of north India, but, in contrast, Brahman women in southern India would not stoop to practise the craft.

In the subsection on ‘Social Framework’, we have touched upon the caste system’s influence on textile artisans. It seems that there was no rigid barrier to adoption or adaptation in textile industry. Then, there are instances of simple “skill compensation.” By 16th-17th centuries, there seems to have been an abundance of skilled textile labour created by centuries of commodity or market oriented production. This was possibly a major factor responsible for the development of extreme specialization and multiplicity of sub-crafts. The caste system presumably also contributed to the evolution of craft specialization in the textile industry. Babur, Terry, Pelsaert, W. Geleynsesen de Jongh, and P.V.D.B.’s accounts attest to this in unequivocal terms. However, the extent of caste determinism should not be over-emphasised. In practice, the artisans based caste system faced a challenge from the mass of ordinary or unskilled people who apparently formed a reserve, from amongst whom new classes of skilled professions might emerge. Secondly, there is no evidence to prove that weavers were eternally fixed in their attachment to a single professions or skill. There are instances
of occupational mobility. Therefore, while it is admitted that caste system was a social reality, but it was scarcely an absolute obstacle to the mobility of labour.

The domestic form largely dominated the sphere of production, but merchant capital also played an important role. The main lever of the merchant's control over weavers was through the system of advances, mostly in the form of money, foodgrain or work-material. It ensured regular supplies answering to given specifications. There were also instances of preindustrial manufactories organized by the Court, nobility and substantial merchants. The Dutch East India Company also attempted to organise production of silk yarn, bleaching and dyeing of cotton cloth on these lines. The condition of artisans working in these manufactories were similar to those of ordinary artisans, with the difference perhaps that, rather than sellers on the market, they were nearer to wage-worker.

A substantial expansion of textile production can, perhaps, be attributed to Mughal times. The large urban market in the Mughal Empire and European trade were presumably the twin factors responsible for such an expansion. We have taken into account the high share of expenditure on textiles in the imperial household. As much as Rs.4,43,305 was spent on furnishing Imperial wardrobe in 1595-6. Even this amount was not reflective of all expenditure. The next important segment of demand for luxury textiles was generated by the nobles of the empire. The middle class
and poorer sections of the urban population also created demand for ordinary textiles. This is also attested by the depictions of poorer people in the paintings of the 16th-17th centuries. Even poorer artisans, are depicted fairly well attired.

The textile production increased also owing to the demand for Indian textiles in overseas markets in Europe, Southeastern Asia and Africa. Evil as it was the Trans-Atlantic slave trade as it grew in the 17th and 18th centuries, increased the demand for Indian chintz, fancied by chiefs and warriors engaged by the European slave-traders to hunt for slaves.

Such an enormous expansion in the demand for textiles of Indian origin doubtless led to increase of employment in textile crafts. A large section of population earned their livelihood by producing cloth and satisfying a growing demand.
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This is to certify that the thesis 'Textile Crafts and Trade in India in the 16th and 17th Centuries' by Mr K.A.S.M. Ishrat Alam is the original research work of the candidate, and is suitable for submission to the examiners and for the award of the Ph.D. degree.

4 October 2004

(Shireen Moosvi)
Chairman
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K.A.S.M. Ishrat Alam

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INTRODUCTION

Since in civilized societies textiles form a basic necessity of life along with food and shelter, the development of textile crafts and trade in textile products constitute a very important department of pre-industrial economies. Within pre-colonial India, different regions developed a noteworthy degree of specialization based on local supplies, income levels, inherited labour skills, etc. It can be even argued that India’s industrial strength and wealth in the early modern period especially during the sixteenth and seventeenth centuries rested squarely on textiles which were manufactured across the entire subcontinent.

1. For the geographical distribution of textile industry, see its mapping in Irfan Habib, *An Atlas of the Mughal Empire*, Delhi, 1982.

2. According to one estimate, in Bengal alone as many as 26,000 to 37,000 persons got employment in weaving cloths and 34,000 to 44,000 spinning silk for the Dutch East India Company (see Om Prakash, *The Dutch East India Company and the Economy of Bengal, 1630-1720*, Princeton, 1985, pp.240-244. Sushil Chaudhury on the other hand, thinks that Om Prakash’s assumption based on the acceptance of one covid equivalent to 27 inches is not supported by contemporary evidence. Sushil Chaudhury’s contention is that one covid was about 18 inches and therefore the estimate of 100,000 jobs created in the textile industry by the export of the two Companies should be reduced by at least 1/3. See Sushil Chaudhury, "European Companies and the Bengal Textile Industry in the Eighteenth Century: The Pitfalls of Applying Quantitative techniques", *Modern Asian Studies*, 27(2), 1993, pp.321-340; see also Om Prakash’s arguments in an accompanying article, Om Prakash, “On Estimating the Employment Implications of European Trade for the Eighteenth Century Bengal Textile Industry – A Reply”, *Modern Asian Studies*, 27(2), 1993, pp.341-356.
With its long history in India behind it, the technology of textile manufacture including techniques of preparing raw materials, producing yarn, cloth weaving and surface treatment of textiles, involved the creation of widespread labour skills.3

Textile industry contributed a major part of Indian Gross National Product in c.1595, estimated to amount to over 11 per cent of the

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secondary sector. It was also, perhaps, the most important item of long-distance trade. One need not, therefore, be surprised why contemporary medieval notices of textiles or various aspects related to textile manufacture are so numerous. A number of scholars have dealt with varieties of themes relating to textile industry in medieval times. Of these W.H. Moreland was possibly the first who made a systematic study of medieval textile industry.

In his India at the Death of Akbar, Moreland assessed those commodities under the non-agricultural productions which were "quantitatively important, either because they were consumed by the masses of the people, or because they formed the basis of the export trade." Most of his conclusions for the early 17th century were drawn on the basis of European sources. So far textiles are concerned, he made certain fundamental observations. He pointed out that silk weaving was


6. Also see Satish Chandra, "Writings of Social History of Medieval India: Trends and Prospects", The Indian Historical Review, III(2), January, 1977, p.267.
a minor and highly localised industry by the end of the sixteenth century. Domestic supply was so deficient that the demand for it was met by imports.\(^7\) Kashmir produced and worked up silk for its own needs. Bengal produced some surplus. He admits a decline in silk industry in the British period, but contends that “the relative decline (since 1605) is important for the industry itself, but it does not represent a large decrease in the average income of the entire population of India.”\(^8\) Next to silk proper, he also wrote about ‘wild silk’ without identifying it and attributed the origin to a plant rather than an insect. Wool and woollen cloths especially shawls and carpets, were there, but were used by rich because they were extremely expensive.\(^9\) Sann-hemp (\textit{Crotolaria juncea}) was a widely cultivated crop but “not in great quantity.”\(^10\) Jute was cultivated, he claimed, for sacking for local use. He could find only a single item of information for it, and that in Abul Fazl’s \textit{Ain-i-Akbari}. Jute was a low value material until the relative value of cotton and jute changed in the 19\(^{th}\) century with the introduction of machinery. Cotton weaving was, then, by far the most extensive industry in India.\(^11\) India was a major


\(^{8}\) Ibid., p.172.

\(^{9}\) Ibid., p.174.

\(^{10}\) Ibid., p.176.

\(^{11}\) Ibid., p.178.
exporter of cotton textiles, which served the territories in the east coast of Africa between Cape Gardafui and the Cape of Good Hope. In the north, Arabia received substantial quantities of piece-goods which were also transshipped to Egypt from there and distributed thence through the Mediterranean to Europe, the South-east of India. Burma was a major claimant of Indian textiles at least in the 16th century. But by the end of the 16th century its relative importance declined due to the Siamese War. The third important market was provided by Malacca and the Spice Islands. But Moreland’s overarching argument is that one need not assume substantial export of textiles from India because people generally were not properly clad in the countries served by the above narrated markets. Beyond the Straits cotton goods hardly found any markets. Instead of piece-goods the Portuguese carried silver from India to finance their purchases in the Far East. The Japanese bought the sorts of Indian cloth carried there only “for the new and strange fashions and paintings thereof, being a people desiring change.” Spanish ships occasionally carried Indian cloth from the far-Eastern markets to the Philippines, and possibly to Mexico, but it was not likely that the quantity was large.

To meet both internal and external demand, the production of textiles was diffused throughout the country. But Moreland argued that

13. Ibid., p.181.
14. Ibid.
the distribution was not uniform because certain localities had acquired a reputation for special classes of goods and transport system had led to considerable concentrations of the industry in particular areas, "either on the coast or along the inland waterways".¹⁵ All towns and most large villages produced the bulk of the cloth work in the locality.¹⁶ Certain towns had acquired a reputation for specialized piece-goods. In contrast to inland consumption, production for export was confined mainly to four tracts, the Indus plain with its outlet at the port of Lahari Bandar; the places along the Gulf of Cambay upto Dabhol in South; the Coromandel coast; and Bengal.¹⁷

Morleyland found that in its organisation in the 16th century, the Indian industry resembled in essentials the contemporary European one. The management of business had not been separated from the work of manufacture, and production was carried on by artisans without "superior capitalist direction". Production was carried on by mostly independent artisans with meagre resources and forced to market their goods immediately upon completion.¹⁸ Besides the artisan production, these were also great enterprises during the 16th century. The germ of this system

¹⁵. Ibid.
¹⁶. Ibid.
¹⁷. Ibid. p.182.
¹⁸. Ibid.
was to be found, in the Imperial Workshops maintained at the Mughal capital.\textsuperscript{19}

The 16\textsuperscript{th}-17\textsuperscript{th} century sources are generally reticent on the question of position of the artisans. From Bernier and Thevenot's descriptions of the conditions of artisans Moreland thought these to be quite miserable.\textsuperscript{20}

Moreland's assumption is that the economic position of bulk of the artisans did not witness any change between 1600 to 1900. The workers remained dependent on purchasers or middlemen for their current expenses and were often destitute.\textsuperscript{21} Since there was no "economic revolution in the intervening period it is reasonable to conclude that the position was substantially the same, and that, while individuals might benefit from powerful and enlightened patronage, the great majority of the workers had nothing to hope for beyond the continuance of the conditions which afforded them a base subsistence".\textsuperscript{22} He identifies the twin factors of the cost of materials and the burden of taxation responsible for the pathetic conditions of artisans. With reference to textile industry, he observes that in Northern India at least the price of raw cotton was also high because the revenue assessment of the crop took it to be more

\textsuperscript{19} Ibid, p.185.

\textsuperscript{20} Ibid, p.186.

\textsuperscript{21} Ibid, p.187

\textsuperscript{22} Ibid., p.188.
valuable than wheat. In such a situation the control of the middlemen or
the financier was obviously greater than the 20th century. Secondly, the
artisans had to contribute to the state revenues by paying taxes.
Eventually, Moreland concludes that the economic life of India at the
end of the 16th century was characterized essentially by inadequate
production and faulty distribution. Productive forces were restrained
because of the despotic tendencies of administration and concentration
of social surplus in the hands of a few unproductive men at the top in the
Empire. The only silver lining in an otherwise dismal situation was the
patronage and encouragement of foreign merchants by the upper classes
who were interested in satisfying their desire for luxuries and novelties.
The key factor in this improvement was therefore to be located in the
expansion of trade. The activities of the foreign merchants stimulated
production by purchasing Indian commodities and introducing new
staples and improved processes. But at the initial stages they did not
“exercise any influence on the administrative exploitation which in
Akbar’s time and from much earlier period dominated and sterilised the
energies of the population of India”. This “root-evil” was shaken in the
18th century through political changes and since then there was a phase

23. Ibid.

24. Ibid.

25. Ibid., p.300.
of "gradual transition from the regime of exploitation, through indifference, to conscious effort for improvement" under British rule.\textsuperscript{26}

Within three years, Moreland brought out another book \textit{From Akbar to Aurangzeb, A Study in Indian Economic History}.\textsuperscript{27} In this work Moreland examined the changes in the economic position from the opening of the seventeenth century to the "next fifty or sixty years, the period covered by the Moghul Emperors Jahangir and Shahjahan."\textsuperscript{28} His study is largely based on the Dutch and English records of the period, in addition to some fragmentary information supplied by Indian sources. He concluded that India benefited by an increase in the efficiency of the marketing agencies at her disposal, but on the other hand, she suffered from the intensification of the state parasitism which was destroying her productive agencies. There were some localities and some classes of producers who benefited by the growth of sea trade under European auspices, but the country as a whole suffered pauperisation "by the operation of internal forces".\textsuperscript{29} Among the external agencies the Dutch East India Company exerted the most important impact, the English East-
India Company occupying the second position. The presence of these two competing organisations was undoubtedly beneficial for India. The survival of English East India Company despite many reverses, according to Moreland, saved India from falling into the grip of a commercial monopoly of the Dutch which they established in "some other parts of Asia". The conditions which prevailed in India were not very conducive for large scale imports. The masses of the people did not have adequate purchasing capacity. The middle classes were small in size and were not permitted to flaunt their wealth for fear of official rapacity, while the King and his nobles provided market only for high-priced goods of small volume. To make matters worse, imports of gold and silver were not in excess of the absorptive capacity of the country and hence could not influence the prices in any significant manner. While on export front, the Dutch and the English companies secured new and extensive markets for Indian producers of indigo, calico, saltpetre, raw silk etc., Indian merchants had failed to exploit these markets. Japan claimed a large share of the Indian silk. Western Europe imported Indian calico, saltpetre and indigo. There was a temporary decline in the export of pepper. The direct advantage accruing to India was confined to particular localities, but there it led to remunerative employment for certain classes of the people. Moreland concluded that there was a substantial increase in

30. Ibid., p.298.

31. Ibid.
the income of these localities. However, on the all-India scale such substantial localised increases would be marginalised. Moreland observed that it was unquestionable "that they [the European merchants] brought substantial economic benefit to growers of indigo and cotton, to weavers, to producers of silk and saltpetre, to the land-transport industry, and to export merchants, classes of much greater importance in the aggregate than the pepper growers, ship owners, and ship-builders whose interests were threatened by the presence of the foreigners. But all these hardly contributed substantially to the total of national income. The scope of benefits for Indian producers, presumably mostly textile producers, had generally enlarged by the creation of an international demand for Indian commodities in Western Europe especially London, Paris and Amsterdam". Thus, according to Moreland, if external relations had not secured substantial on the national scale, there was "a promise of greater benefit to come", that too in the face of injurious internal forces in operation. The Dutch and English had not yet entered largely into the internal trade by land. They concentrated their activities mostly to the coasts. The standard of life was low and people had a small spending

32. Ibid, p.299.
33. Ibid, p.300.
34. Ibid.
35. Ibid., pp.300-301.
power. The bulk of the peasants and artisans of all classes lived at the same bare level of subsistence. The relatively large number of producers contributed half their gross income to the support of a relatively small number of non-producing parasites. This led to the dissipation of the surplus income of the country into unproductive channels. He has pointed out that “the working of the revenue system was a factor of at least equal importance in transferring to the towns a large proportion of the profits earned in the villages.”\(^{36}\) Therefore he prescribed that the remedy lay in fundamental change in the administrative methods which should not penalise increase in production and secondly there should be a gradual change to the new economic system (ultimately brought about-by the British Rule).

Some of the obvious limitations of Moreland’s approach seriously impaired the value of his pioneering works. He heavily dependent upon European published documents and started with a belief in the superiority of the colonial regime to all earlier systems. There was in these two works, at least little reliance placed on Persian sources, and there was no archival work.\(^{37}\) Secondly, while on the one hand, he discounted the existence of documentary material in India for the seventeenth century, on the other, he asserted that European sources were more reliable than Indian sources.

\(^{36}\) Ibid., p.304.

\(^{37}\) Satish Chandra, p.267.
Thirdly, he tried all the time to compare the Indian situation during Akbar’s time with that prevailing in British India prior to the first World War. Moreland was trying to rebut the nationalist charge that the condition of the Indian people had deteriorated under the British Rule. Since Moreland wrote much work on the basis of the Portuguese, Dutch, French and of course the English sources has appeared. We know now that one Company’s version may be tested against another company’s. The number of travellers’ accounts available has increased. There are more regional studies now which have contributed significantly to the assessment of India.

Within a span of six years of publication of Moreland’s Akbar to Aurangzeb, a critique came in Brij Narain’s work Indian Economic Life, Past and Present. Brij Narain tried to establish that the material conditions of the ordinary labourers and the artisans were better off during Akbar and Jahangir’s time (late sixteenth and early seventeenth century) than during the first quarter of the twentieth century. Since our concern is the textile industry, we may quote the following from Brij Narain: “The earnings of weavers in the Punjab (and it is doubtful if weavers in..."

38. Ibid.
39. Ibid.
40. Brij Narain, Indian Economic Life, Past and Present, Lahore, 1929.
other parts of India are more prosperous) may correctly be described as starvation wages. The weaver in the time of Jahangir (representing the most important and numerous class of artisans), compared with his modern representative, lived in luxury". Brij Narain considered that the foreign trade of a country was a very good index of the economy of a particular country. The bulk of the exports of India in the 16th and 17th centuries consisted of cotton manufactures. He considered that the whole world constituted a market for the products of "this national industry." Textile industry thus provided large scale employment to workers in the country. Such substantial exports presupposed the existence of, apart from artisans, a rich and influential middle class comprising largely of merchants. But these apparent signs of prosperity had vanished by the beginning of the twentieth century. The hand workers were unable to "compete with power-driven machinery and India ceased to be self-sufficient in regard to the supply of manufactures ... not that the masses of Indian consumers now roll in wealth". Brij Narain's contentions were again based essentially on the same sources which had been used by

42. Ibid., p.26.

43. Ibid., p.50.

44. Ibid., p.52.

45. Ibid., pp.57-64.

46. Ibid., p.52.
Moreland, including Dutch sources.

These works led to the rise of a debate among scholars regarding India’s capacity to industrialize during Mughal and British period of Indian history.47 One of the major subjects of the debate touch upon position of textile industry because of its primacy in the production sector. While Morris D. Morris and a host of subsequent scholars have tried to negate any adverse impact of colonialism on the textile industry in the 19th century, Bipan Chandra and others have tried to prove the reverse.48

However one major contributor to this debate, and that too concerning our period of study i.e. 16th-17th century has largely gone unnoticed except his ‘pedlar trade hypothesis’. J.C. van Leur considered Moreland’s pessimism “somewhat too strong, even though the difficulties offered by the material must not be underestimated. Almost every time one reads one of Moreland’s sound, excellent chapters, the questions arise: How did such technological and organizational forms come into


48. Ibid.
existence? How did a system of credit instruments extending over areas greater than those of medieval and early-capitalistic Western Europe originate? How did Indian fortunes as huge as the Fugger’s arise? How did the whole system of crafts, commerce, and overseas trade develop? . . .” 49 He was of the opinion that the conditions for the rise of such forms “did not by any means date from the sixteenth and seventeenth century”. 50 It could have been possible in earlier ‘historical milieu.’ 51 He thought that the geographical reasons were responsible for distinctly different developments taking place in north and southern parts of India. There were large territorial states in the plains of northern India which were cut off from the north and the east by high mountain chains and rivers while the southern part had coastal states of a limited size especially on the western coast, “where the mountains come very close to the sea along the whole coast.” 52 Due to such geographical factors, according to Van Leur, in the northern and southern parts of India, there was no possibility “for a parallel situation to develop. And in the field of political history every parallel must be abandoned completely.” 53 Therefore, there were


50. Ibid.

51. Ibid.

52. Ibid., pp.64-65.

53. Ibid, p.65.
migrations and all such migrations contained elements of ‘trade’\textsuperscript{54} Since north-western India was approachable through land and sea, this part of India “belonged to the trading area of the ancient-world”\textsuperscript{55} immediately succeeding the advent of the historical era.\textsuperscript{56} The trade was carried from ‘port town to port town’.\textsuperscript{57} He argues, “The coastal principalities, independent urban monarchical or aristocratic regimes, dominated trade, interfering not only by levying tolls and requiring compulsory stapling, but also by carrying on trade and shipping of their own, regulating prices, claiming the right of pre-emption, acting as the financiers of trade. The ruling class was the chief owner of land (which was usually leased out to small farmers for rent in money or kind), had political control of the city, accumulated its chief movable wealth from trade, owned ships, possessed money, carried on occasional trade, sometimes exploited craftsmen working in ‘putting-out industries’. There could also exist an urban patriciate on a level with the politically dominant group as far as the size of possessions was concerned, though more or less widely separated from it in class traditions, economically the two groups operated in alliance with each other.”\textsuperscript{58}

\textsuperscript{54. Ibid.}
\textsuperscript{55. Ibid.}
\textsuperscript{56. Ibid.}
\textsuperscript{57. Ibid., p.66.}
\textsuperscript{58. Ibid.}
Van Leur emphasised the role of trade: "The actual trade was handicraft trade, peddling trade, the work of the mass of merchants; the structure and 'economic mentality' of such an international trade must be thought of in terms of handicraft forms." He assumes that owing to this kind of commercial organization, large number of traders were involved in trade. This led to establishment of several merchant diasporas on the basis of city and region of nativity and ancestry. In such a scheme the aristocracy and the patriciate were 'passive' participants in the international trade. They were its financiers investing occasionally in commenda and bottomery. The 'active' ones were the handicraft traders undertaking journeys with commenda money or commenda merchandise, and, alongside them, the independent handicraft traders, among them pedlars travelling with packs on their backs, journeying individually or in company as pedlar caravans. Shipping too exhibited the same forms, the commander and crew carrying on trade on their own account alongside the carriage of people and goods. Therefore Van Leur classified the royal court, the aristocracy, and the urban patriciate as a class separate from the great mass of pedlars and craftsmen forming the other class.

59. Ibid.
60. Ibid.
61. Ibid., p.67.
62. Ibid.
63. Ibid.
There was an international trade in valuable high quality products and the value of turnover was very high.⁶⁴

Van Leur was of the opinion that there had been no change in nature of organisation of trade "for at least two thousand years upto and into the seventeenth century."⁶⁵

Thus Moreland and J.C. van Leur both subscribed to the Eurocentric position that world trade was created and dominated by Europeans, even in Asia. First the Portuguese and then other Europeans like the Dutch, the English and French were assigned disproportionate importance in Asian trade. This tendency is partly due in part to the fact that it is they who left most records of the Asian trade. These records also reflect their own participation and preferences more than those of their Asian counterparts both as partners or as competitors. J.C. van Leur wrote,

"The general course of Asian international trade remained essentially unchanged . . . The Portuguese colonial regime, then did not introduce a single new economic element into the commerce of southern Asia . . . In quantity Portuguese trade was exceeded many times by the trade carried on by Chinese, Japanese, Siamese, Javanese, Indians . . . and Arabs . . . Trade continued inviolate everywhere, . . . . The great inter-Asian trade route retained its full significance . . . . Any talk of a European Asia in the eighteenth century is out of the question."⁶⁶

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⁶⁴. Ibid.

⁶⁵. Ibid., p.67.

⁶⁶. Ibid., pp.193, 118, 164, 165, 244.
M.A.P. Meilink-Roelofsz in turn challenged the Van Leur thesis and asserted that European influence was not only greater but also earlier than Van Leur allows. Yet eventually she substantiates Van Leur's essential thesis that it was only about 1800 that Europe began to outstrip the East on the basis of Western industrialization and the development of modern capitalism.67

These debates led to further investigation of the nature of composition of trade. Kristof Glamann pointed out the change in the specific position of different items of trade in the course of the seventeenth century. According to Glamann the east India imports to the Netherlands remained fairly unchanged between 1619 – 1621 to mid 17th-century. More than half of the invoice amount was placed in pepper, while the spices and textiles held the second and third places respectively.68 From the middle of the 17th century the situation began to change. The share of pepper started declining from 56.45% in 1619-21 to 50.34 % in 1648-50, 30-53% in 1668-70 and eventually to 11.23 % by 1698-1700.69 The share of textiles including silk, cotton etc. had a share of 16.06%, 14.16


69. Ibid., pp.13-14.
The decline of pepper continued. The textile group during the first four decades of the 18th century also shows a distinct decline, after which the group regains a little ground. Coffee and tea now assumed ascendancy. By 1738-40 coffee and tea claimed a share of as much as nearly 25 per cent of the total. The last decades of the 17th and the first decades of the 18th century also witnessed striking displacements.

Niels Steensgaard is in agreement with Van Leur as far as the significance of Asian trade in the world trade as a whole is concerned. In the first half of the 17th century, the Dutch and English East India companies were sucked into the old pattern of Asian trade. The Company trade became integrated with the “peddling” trade. The market was the peddling market being subjected primarily to sudden price fluctuations, the poor transparency of the market, “no ‘second hand’ to even out a

70. Ibid.
71. Ibid., p.15.
73. Ibid., p.14, 147-151.
75. Ibid., p.398.
76. Ibid.
monetary discrepancy between supply and demand in a market in which all business has to be concluded before the monsoon arrives and the climate becomes dangerous. As far as the continuity in the Asian trade pattern is concerned, he agreed with Van Leur's conclusion that the Northwest European Companies did not, before the middle of the 17th century, endow the traditional trade with important new features except where they had acquired political power. But unlike Van Leur, he considered the European companies to constitute an important new element in the traditional trade: "The companies did not transform the early Asian trade, but they were not transformed themselves either; they were as profit making institutions distinct from and superior to the pedlars and the redistributive enterprises." The Dutch East India Company realized its aim of establishing a multi-lateral, coordinated trade based on Dutch capital in Asia in the course of the 17th century. The Dutch orders to Batavia from Persia provide a catalogue of commodities to be obtained from different parts of Asia for Persia. In these lists pepper and other spices dominate, but textiles and dyes especially indigo also claimed a considerable share. We touch on these facts in our investigations in the

77. Ibid.
78. Ibid., p.406.
79. Ibid.
80. Ibid., p.407.
81. Ibid., pp.407-408.
second part of this dissertation. Furthermore, Steensgaard has calculated that 25-30,000 camel loads of cotton materials were imported annually by Persia from India. In 1638-39, cotton material worth nearly 200,000 fl. was sold in Persia, some at 4-5% loss and some with 10-40% profit. Only the material from Bengal and Coromandel could render a profit of 60-70%. However, it was found that if the 60 or 70% profit in Persia was not made in cloth purchased in India, the business would not be a profitable one. Secondly, the trade conducted through the Levant i.e. the caravan route was still profitable. The fact that Persian silk reaching Europe by traditional channels through Levant sold at the Company’s prices, raised serious questions about the rationale behind continuation of overseas trade by the Company. This was good evidence, says Steensgaard, for survival of the peddling trade.

On the caravan routes linking India to Persia, Moreland was of the opinion that the trade conducted through this route was of little significance. According to Moreland, the ‘normal’ traffic between India to Persia hardly exceeded 3000 camels annually or 500 tons. Part of it was diverted by the Dutch and English navigation. He considered that

82. Ibid., p.410.
83. Ibid.
84. Ibid.
85. Moreland, India at the Death of Akbar, p.218.
86. Moreland, From Akbar to Aurangzeb, p.59.
the overland routes’ significance had dwindled and overseas trade potential had increased. K.N. Chaudhuri and Ashin Dasgupta scarcely discuss the importance of overland route to Persia. However Van Santen has touched upon this theme and pointed out that the growth in exports from Surat to Persia, especially in the second half of the seventeenth century, should not be interpreted necessarily as index of growth of Indian exports because the trade conducted through overland route is not known. Steensgaard, on the basis of Shireen Moosvi’s analysis of surviving treasure – troves from the Mughal empire, asserts that the significance of the caravan route between India and Persia via Qandahar has been grossly underestimated. The rupee coinage from the mints of the north-west (Lahore, Multan, Thatta, Kabul and Qandahar) was often larger than the output of the Gujarat mints, and in two ten-year periods (1616-25 and 1636-45) it was 40 to 41 % of the total North Indian Mughal

87. Ibid.


coinage. In the period 1646-65 the contribution of the North-West Indian mints was still considerable (29 and 23 %), but during the last decades of the century there was a regular decline (13, 12, 7 and 4 %). Steensgaard further estimated that at least 9,500 camels were employed on this route. In this trade cotton textiles were by far the most important item: 594,000 pieces in 1634 at a cost of Rs.1,382,000 constituted 72% of the purchase value. In 1634, on the overland route textiles constituted in value 28% of the total Persian import from India. These cotton pieces mostly originated from Awadh, Bengal and possibly the Punjab.

On inland trade some data have been collected. According to Irfan Habib’s estimate a Banjara caravan usually contained about 10,000

91. Ibid.
92. Ibid., p. 57.
93. Ibid., p.68.
94. Ibid., p.69.
95. Ibid. In an earlier paper Steensgaard regarded Asian trade through the Indian Ocean to be of marginal significance. He cites Moreland’s and Bal Krishna’s estimates of 52000 to 57000 tons and 74,500 tons respectively, of long distance trade annually at the opening of the seventeenth century. He compares them with half a million or approximately a million tons of shipping capacity of Europe at the time. Steensgaard himself concedes that these Indian Ocean trade figures do not include coastal shipping, which was also considerable and a part of long distance trade (“The growth and composition of the long distance trade of England and the Dutch Republic before 1750” in James D. Tracy, ed., The Rise of Merchant Empires, Long-distance Trade in the Early Modern World, 1350-1750, Cambridge 1st pub. 1990, rep. 1993, pp.102-152).
bullocks and could rise to as many as 20,000. The Banjara merchants alone transported 2,500,000 lbs. of cotton in Deccan alone. With a carrying capacity of between 240 to 260 lbs. per bullock, between 10,000 and 15,000 bullocks were needed to supply the required amount which was a figure well within the capacity of Banjara caravan trade. According to Irfan Habib, the Banjara conveyed annually 1.14 million metric tons of goods each year. Considering the vastness of the country, this still amounted to a considerable volume. By comparison, two centuries later, Indian railways handled about 2,500 million metric ton-miles. Though cotton and textiles were not the only commodities transported, we can safely assume that these were two of the major items in the inland trade. J.J. Ketelaar reports, for example on 26 December 1712, while he was passing through Sironj, famous for its textiles, that it had three sarais (inns) and there were 'caffilaes' (caravans) ready with textiles for the Imperial court.


98. Ibid.


100. Ibid.

Besides the Banjaras, there were numerous small traders with meagre capital in many parts of Asia. There were, at the same time several merchants with substantial wealth, such as Virji Vohra and Mulla Abdul Ghafur at Surat in the 17th century, Cassa Vesona at Madras in late 17th century, Jagat Seths and Khwaja Wajid in early 18th century in Bengal.102 We hear of Mokdum Nina, a prominent Chulia merchant and ship-owner of Porto Novo, Malaya, alias Astrappa Chetty, from the Paleacat region, Muhammad Sa‘id better known as Mir Jumla, and many other merchants who traded on some scale in the southern peninsula.103 These merchants operated in an atmosphere of free and open competition, and as has been observed by Irfan Habib, the ‘atomised commerce’ could be as efficient as the trade of the Dutch or English Companies.104

Indeed, K.N. Chaudhuri’s contention that India and China witnessed normal trade transactions and their economies benefited

102. Cf. Sushil Chaudhury and Michel Morineau, eds., Merchants, Companies and Trade, pp.3-4; see also Amiya Kumar Bagchi, Capital and Labour Redefined, India and the Third World, Delhi, 2002, pp.17-70 for an assessment of the changes in the position of merchants in pre and post colonial phases of their existence.


104. Irfan Habib, “Merchant Communities in pre-colonial India” pp.397-8.
immensely from the expansion of economic relations with the West, should be accepted only with a pinch of salt. According to him, the huge influx of bullion was caused by new demand and indicated growth in income and employment.\textsuperscript{105} Shireen Moosvi has rightly questioned the thesis that simple continuous import of bullion (mainly silver) could in itself be of any use in any economy particularly when there was a steady international depreciation in the value of silver.\textsuperscript{106} Similarly another major observation of K.N. Chaudhuri that the export of textile transformed the coastal provinces of India into major industrial regions remains largely unsubstantiated. Even if it is conceded that there was an expansion in the number as well as size of merchants and consequently merchant capital, but merchant capital through its own development was not capable of a transformation into industrial capital.\textsuperscript{107}

Unlike north India, in southern India we hear about the existence of powerful caste organisations of weavers receiving economic, social and ritual privileges from the kings, temples and society in general during the 14\textsuperscript{th}-16\textsuperscript{th} century.\textsuperscript{108} Later, in the 17\textsuperscript{th} century it has been argued by


\textsuperscript{106} Shireen Moosvi, \textit{The Economy of the Mughal Empire c. 1595, A Statistical Study}, Delhi, 1987, pp. 390-91.

\textsuperscript{107} Irfan Habib, “Potentialities of capitalistic Development in the Economy of Mughal India”, pp.228-229.

Vijaya Ramaswamy that some master weavers also emerged. But the weavers gradually began to lose their privileged position and autonomy when the European Companies began to dominate the production of cloth.

On the textile technology much has been written since Lynn White raised doubts on the Indian origins of the spinning wheel, and Joseph Needham claimed Chinese origins for it. Irfan Habib has written on the various technological stages of textile production, and the present

109. Vijaya Ramaswamy, pp.141-144.


writer on the origins of cotton gin.\textsuperscript{114}

In the present thesis an effort is made to offer a comprehensive survey of the evolution of textile technology, based on the work so far done and other evidence that I have been able to gather; and, without seeming to be immodest, I may claim that this is the only updated study exclusively devoted to the principal technological aspects of pre-industrial textile production in India.

Thus regional studies of textile industry and trade that have appeared so far, important as they are, have been largely confined to Gujarat, the Coromandel and Bengal.\textsuperscript{115} Unfortunately too there are still

\textsuperscript{114} Ishrat Alam, "Textile Tools as Depicted in Ajanta and Mughal Paintings", pp.129-130.

large gaps in our information on certain crucial aspects (e.g. price movements). Our task is further rendered difficult on account of the miscellaneous nature of sources. Therefore, in the present thesis a special attempt has been made to tap information wherever possible, especially from Persian texts, inscriptions, vernacular literature, Dutch and English East-India Companies’ records, European travellers’ accounts, supplemented by contemporary miniatures, and modern drawings. I have found that Dutch documentation is particularly rich and important as a primary source of information. I have consulted large numbers of both manuscript and published records. They are particularly crucial for the practice of sericulture, hemp production, organisation of production, socio-economic differentiation among weavers, varieties of textiles, nature of exports and forces determining the demand and supply of Indian textiles.

Modern work beginning with Moreland has relied heavily on the archives of the English East India Company (‘Factory Records’) and the accounts of European travellers. Moreland, to his credit, also began to

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study the Dutch Company records, which are much richer than those of
the English Company. He translated Pelsaert’s famous *Remonstrantie*
(1626).116 In more recent work on economic history there has been an
increasing tendency to explore Dutch material, a tendency which can
naturally be seen best in the work on the Dutch Company and sea-borne
commerce and so begins especially with Tapan Raychaudhuri,117 Ashin
Das Gupta,118 S. Arasaratnam,119 Om Prakash120 and Sushil Chaudhury.121

116. Francisco Pelsaert, ‘Remonstrantie’, tr. under title, *Jahangir’s India*
apart from ‘Remonstrantie’, Moreland also tr. and ed., *Relations
of Golconda in the Early Seventeenth Century*, Hakluyt Society,
London, 1931; Pieter van den Brooke, “Surat Diary, 1620-9”, tr.
W.H. Moreland, *Journal of Indian History*, X, pp.235-50; XI, pp.1-
16, 203-18.

117. Tapan Raychaudhuri, *Jan Company in Coromandel 1605-1690, A
Study in the Interrelations of European Commerce and Traditional

118. Ashin Das Gupta, *Malabar in Asian Trade, 1740-1800*, Cambridge,
1967; Ashin Das Gupta, *Indian Merchants and the Decline of Surat,

119. S. Arasaratnam, *Merchants, Companies and Commerce on the
Coromandel Coast 1650-1740*, Delhi, 1986.

120. Om Prakash, *The Dutch East India Company and the Economy of
Bengal, 1630-1720*, Princeton, 1985; Om Prakash, *European

121. Sushil Chaudhury, *Trade and Commercial Organization in Bengal
1650-1720*, Calcutta, 1975; Sushil Chaudhury, *From Prosperity to
Decline Eighteenth Century Bengal*, Delhi, 1995.
There have also been considerable explorations of the French Company records, a special place belonging to the Memoir of Georges Roques (1678-80) on the textile industry of Ahmadabad and Sironj, fragments of which have been separately translated. Finally, there are Persian texts and documents, none unfortunately directly dealing with textile trade or crafts, but giving much information through incidental notices. One set of Persian documents containing two imperial orders of land-assignments and land-grants unexpectedly introduce us to Akbar’s retired master-dyer; and the A’in-i Akbari, mainly concerned with administration, has much on the dyeing of textiles.

In the present thesis, while material from all the above kinds of sources has been used, much new information has been obtained from unpublished and little-known reports of Dutch factors. This hopefully gives to the present work an added strength.

122. Georges Roques, “La maniere de negocier dans les Indes Orientales” [Written 1678-80]. Transl. of portion on cotton-printing at Ahmadabad and original index of subjects by.

123. Irfan Habib, “Three Early Farmans of Akbar, in Favour of Ramdas, the Master Dyer”, in Irfan Habib, ed., Akbar and His India, Delhi, pp.270-287.

THE MAKING OF TEXTILES
1. COTTON PROCESSING AND WEAVING

The Prehistory of Cotton

There is a great deal of debate about the origin of cotton/old World cotton. A.de. Candolle, a botanist had claimed that *Gossypium herbaceum* was developed from certain wild cottons, notably *G. stocksic*, found in present day Pakistan.¹ His second observation was that the ancestors of the domesticated *G. arboreum* could be traced in wild cotton found in upper Guinea and along the valley of upper Nile.² After him many theories have been put forward. Some consider India to be the home of cotton,³ others consider Arabia, the Sudan or other parts of the Sahara and the savanna lands around this desert.⁴ More recently, Hutchinson and others have claimed that it originated first in South-West Africa and Angola.⁵ He, however, has recently modified his opinion and now is of the opinion that many apparently strains of wild cotton are in fact ‘escapes’ descended from cultivars, or wild “associates” of the cultivated plants that have developed through intercrossing.⁶ Since intercrossing is easy

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² Ibid.

³ Ibid.

⁴ Ibid.

⁵ Ibid., p.32.

⁶ Ibid.
in cotton, the wild ancestor of cultivated plant may have disappeared because it developed in association with cultivars. Thus this hypothesis explains the trouble in finding truly wild ancestors of either *G. arboreum* or *G. herbaceum.*

Besides botanical efforts, we have the archaeological and literary evidence which need careful analysis. The earliest archaeological evidence of cotton seeds come from Period II of Mehrgarh on the Bolan river in Central Baluchistan dating back to the fifth millennium B.C. K.D. Sethna argues that it was a wild cotton. He doubts cultivation at Mehrgarh. The earliest archaeological comes from 5000 B.C. and after 5000 B.C., the next archaeological evidence comes from Mohenjodaro. A microscopic examination of it suggests that it was a close relative of *G. arboreum.* Mixed cotton stuffs have been reported from 1500 to 1000

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7. Ibid.


10. Ibid.


B.C. at Nevasa (cotton with silk) and at Chandoli (cotton with flax threads). Watson is of the opinion that cotton cultivation spread from India to the west and east both in different times.

Watson, the latest in the line of historians concerned with cotton, is of the opinion that the north Western part of the Indian subcontinent was possibly the cradle of cotton cultivation from which an “ennobled” plant was diffused to other parts of Asia, the Middle East, Africa and Europe. Ctesias (5th Century B.C.) stated that Indians traded cotton garments with people of North of the Himalayas (mountains to the north). By the 1st Century A.D., Scotra, Eritrea and the Horn of Africa received cotton from India. Egypt was importing cotton from India in the early third century A.D. Indian cotton reached Mongolia in the first

Contd.

the period, see Watson, pp.32, 163 (note 10) considers them to be of 1500-1000 B.C. But the other date assigned is 3000-1500 B.C., see A.M. Dani and J.P. Mohen, eds., *History of Humanity*, pp.246-263.

13. Watson, p.32.

14. Ibid.


16. Watson, p.32.

17. Ibid., pp.33-34.

18. Ibid., p.34.
century A.D., and Xinjiang, Turkestan; and Palmyra received it in second-third century A.D. By the early 6th century it reached China.19

Dieter Kuhn, on the basis of Hutchinson, Silow and Stephens works, thinks that there were two regions in India which produced two different species of cotton.20 Firstly *G. herbaceum*, a short seasonal annual plant producing short staple fibres of inferior quality, originating in the Indus valley civilization reached China by the 'silk road', around the first century A.D.21 But it remained confined to basin of Turfan and Khotan.22 Here the seeds of *G. herbaceum* and cotton fabrics have been archaeologically attested.23 A second specie of cotton was of *G. arboreum* reached the Yunnan province via Assam and Burma from East Bengal.24 It became a speciality of Szechwan province.25

**Cotton Processing: Seed-extraction and Fibre-separation**

Cotton created for itself its own technology from the very beginning. The preparation of cotton for weaving cloth is preceded by three processes

19. Ibid., p.35.
21. Ibid.
22. Ibid.
23. Ibid.
24. Ibid.
25. Ibid.
- (a) extraction of the seeds (b) separation of the fibres, and (c) spinning of the yarn. Each of these three processes involves specialized skills and tools.

Cotton was one of the major cash crops of India. Its cultivation during the sixteenth and seventeenth centuries was noticed in the so called Bombay Cotton Tract especially in Khandesh. Cotton was cultivated in the northern India and extensively grown in Bengal. It was in comparison to the 19th century grown on a smaller acreage which was possibly the reason why it was assigned high value in comparison to other crops listed in the Ain-i Akbari. The peasants used to carry out initial manufacturing processes before it was carted out of the village. It was, therefore, the peasants who generally picked and ginned cotton.

After being removed from the field, the harvested cotton has to be left in the sun for a few days, so that the seed’s adherence to the floss weakens.

The seed has now to be extracted out of cotton. In India, this has been done traditionally by two means, viz., the roller-and-board, and the

27. Ibid.
28. Ibid.
29. Ibid.
30. Ibid., p.63.
31. Ibid.
worm-press (*charkhi* in Hindi). Both the forms appear to be of ancient origin. The roller-and-board was present in nearly all ancient civilizations for various purposes. The roller used to be cylindrical and was worked with hands on a flat board. D. Schlingloff has pointed out reference to its use in ancient Indian texts and in the Ajanta frescoes (Pl.1). Its apparent solidness suggests the use of stone for roller and board. This mode of threshing was presumably done to loosen the cotton wool's tenacious adherence to the seeds, in order to facilitate its further ginning in the worm-press. That it continued to be used in medieval India is confirmed by the description and accompanying illustration of a wooden instrument called the *chobkin*, used for separating cotton from the seeds (Pl.II).


33. Its usage continued till the late nineteenth century except that rollers were made of iron later. The cotton ginned in this manner was called ‘stone-cotton’. See George Watt, *The Dictionary of the Economic Products of India*, (Henceforth *D.E.P.I.*), IV, London, 1890, pp.105-06.

34. Ibid. IV, pp.105-06. This practice was quite common for ginning cotton in the nineteenth century. This laborious and ineffectual process of stone-cleaning was advised to be replaced ‘at least by the *churka* (*chakhri*)’ (Ibid., p.106).


This method was also practised in medieval China. This was probably the wooden roller, though whether it was moved by hand or feet is not made clear. The foot-manipulated roller was widely used in the nineteenth century in South India. Perhaps, both practices have been simultaneously in use. Indeed, the continuity of its usage till recent times indicates a popular receptivity to its usefulness.

The worm-press or worm-roller (Hindi-Charkhi) is mechanically a much more advanced device. It consists of two cylindrical rollers joined by a pair of helical gears so as to move in opposite directions when one of them is turned by hand or crank-handle. Both rollers are horizontally placed and are supported by two uprights. After the addition of the crank-

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38. Watt and Murray in D.E.P.I. ,IV, pp.152-3, describes a similar process except that it worked with the worker’s feet manipulating the roller. Owing to this, they call it a foot-roller. Sometimes the rod is shorter and slightly conical, in which case the motion is circular. This had an advantage over the hand roller in that the pressure of the feet was joined by the rolling motion which certainly increased the rapidity of the extraction. On worker can, in this way, turn out from four to six pounds of cleaned cotton in a day. The feet also do not tire as much as the hands. This can, in turn, keep the work going for a longer time.
handle, the lower roller is turned by it on the one end,\textsuperscript{39} which communicates motion to the rollers.\textsuperscript{40} Once the cotton is fed into the revolving rollers, the fibre is drawn through. The seeds being too large are unable to pass through the closely wedged rollers and are expelled and dropped to one side.

The prevalence of this device in ancient India is being proved by its widespread presence in India,\textsuperscript{41} Cambodia and Xinjiang (Sinkiang).\textsuperscript{42} India exercised a very powerful influence on Cambodia’s culture during the first millennium of the Christian era. Since the Indo-Cambodian cultural relationship belongs to the period fifth to tenth century AD,\textsuperscript{43} it is likely that transmission of the device took place at that time. China received cotton-gin with cotton itself from India between sixth to thirteenth century probably through two routes: ‘through Burma (sixth century); and Indo-


\textsuperscript{40} By the mid-19\textsuperscript{th} century, the \textit{charkhi} had even started having a wheel at one or both ends, \textit{D.E.P.I.}, IV, pp.152-53.

\textsuperscript{41} For its widespread use in India in various provinces, see \textit{D.E.P.I.}, IV, pp.105-06, 115, 123, 147-48, 152-53.


\textsuperscript{43} For Indo-Cambodian contacts, see R.C. Majumdar, \textit{Inscriptions of Kambuja}, Calcutta, 1953; See also, Himanshu P. Ray. \textit{The Winds of Change, Buddhism and the Maritime Links of Early South Asia}, Delhi, 1994, pp.87-120.
China through Sinkiang (thirteenth century). But the more conclusive evidence for its presence in ancient India would be the Ajanta fresco where what Schlingloff recognizes to be a bow-string device to separate cotton fibres seems really to be a **charkhi** (Pls. I and III). It is depicted with its characteristic rectangular frame, which has nothing in common with the bow-string device. Both the upper rollers are visible, though they are slender (perhaps of iron). Quite reasonably a crank-handle is not shown (since the crank is a late comer in this technology). A woman is shown moving the upper roller with the left hand and inserting the cotton by the right-hand. This evidence makes it almost certain that the device was known to Indians by the middle of the sixth century AD.

This can easily be reconciled with the view that the **charkhi** reached China (sixth to thirteenth century) and Cambodia sometime during this period from India. As far as history of this device in Islamic World is

44. Needham, IV(2), pp. 122-24, 204.


46. This fresco is in Cave No.1, which dates back to the middle of the sixth century A.D., see M.K. Dhavalikar, *Ajanta – A Cultural Study*, Poona, 1973, p.2.
concerned, Irfan Habib could not find evidence to attest to its presence there. It seems that a variant form of Indian cotton-gin was received by the Islamic World which had double rollers while the worm-gearing was lost in the transition.\textsuperscript{47} Similar was the experience of China.\textsuperscript{48}

The Indian origin of this device has no other documentary evidence, but the use of the same mechanical principle of the Indian sugarcane rollers is significant. It cannot escape notice that while there is no early evidence of the worm-rollers in any other civilization, both cotton and sugarcane were indigenous to India. The main difference between the two kinds of rollers is that the cotton-gin is always mounted so as to rotate vertically whereas the sugarcane rollers move horizontally owing to the employment of cattle-power.

As for the worm-gear in the Indian cotton-gin, some doubt has been raised. Indeed, it is conjectured that this could have consisted of two rollers moved by a handle only, since worm-gearing was alien to Indian technology.\textsuperscript{49} Such a suggestion, however, is not tenable in the absence of evidence in its support. For the mechanism of worm-gearing


\textsuperscript{48} Ibid.

in the cotton-gin, the significance of the Ajanta fresco is that the cotton-gin without a gearing mechanism would be held alien to Indian technology only if it was established that it was invented outside India, and if it was an importation it could have come only during or after that period. China received cotton-gin with cotton itself. But it was devoid of worm-gearing owing to its knowledge of double-powered rollers since the Han period. Therefore, it adapted the Indian cotton-gin to its indigenous practices and instead of worm-gearing, the earliest Chinese depiction of a cotton-gin of the fourteenth century had a crank-handle for each roller. The earliest available depiction of the charkhi in a miniature Kangra painting, of the mid-eighteenth century, shows parallel worms. However the artist has erroneously transferred the worm to the handle (Pl.IX). The worm was known to Europe since classical times, but this particular form of worm-gearing is only traced to the early nineteenth century. There is no evidence for Islamic world’s familiarity with it. The hardness of Indian cotton also makes it, technically speaking, difficult to gin on a cotton-


52. M.S. Randhawa, Kangra Paintings of the Bhagvata Purana, New Delhi, 1960, p.50, Pl.V. The cotton-gin is prominently shown in Pl.V. which deals with ‘Migration from Gokula to Vrindavana’.


gin without a crank-handle or worm-gearing. For ginning, the rollers were supposed to be closely wedged. This could only be achieved with a crank handle or worm-gearing or both. Therefore, the chances of worm-gearing in the Indian cotton-gin are greater in the absence of a crank-handle. In view of this it may be concluded that the Indian cotton-gin presumably had worm-gearing since its inception and it remained in use till the late nineteenth century.  

The dating of another important part of the charkhi, i.e. the crank-handle is not certain. Documentary references such as in the Bahar-i Ajam (1740) are not helpful. But the depiction of a cotton-gin in a miniature Kangra-painting of the mid-eighteenth century shows the crank handle (Pl.IX). It is possible that the cotton-gin received the crank-

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58. Tek Chand ‘Bahar’, Bahar-i Ajam, AD 1739-40, lithographed, Lucknow, 1916 s.v. charkh. The Bahar-i Ajam seems to give the earliest textual evidence for charkhi when it refers to the cotton dresser’s wheel, i.e. cotton-gin (charkh-i naddafi).

59. M.S. Randhawa, p. 50, Pl.V.
handle along with the spinning-wheel in the thirteenth-fourteenth century. The cotton-gin depicted in the Kangra painting shows parallel grooves in both the rollers which presumably enhanced the grip of the rollers. The cotton-gin with worm-gearing and crank-handle had increased its efficiency to gin cotton more rapidly and finely. No further mechanical change can be traced, but at some stage water-power was used to drive the charkhi in Pakhli in the Hazara district between the Indus and the Jhelum. The use of the charkhi would possibly have been of great economic significance. It has been estimated that its average capacity to clean cotton varied from six to eight pounds per day, per man/woman. Thus cotton-gin had an advantage over the roller-and-

60. Irfan Habib, “The Technology and Economy of Mughal Empire”, The Indian Economic and Social History Review (henceforth I.E.S.H.R.), XVII(I), Delhi, 1980, p.7 has traced the addition of the crank-handle to the spinning wheel during the seventeenth century; see also, Irfan Habib, “Joseph Needham and the History of Indian Technology”, pp.261-262.

61. M.S. Randhawa, p.50, Pl.V.

62. Unlike in India, charkhi witnessed many improvements in China in the form of the addition of a treadle motion to the upper roller besides the crank-handle. This motion was assisted by a radial bob-flywheel. In Japan, the flywheel tended to take the form of a single club-shaped weight attached to the shaft by the early seventeenth century (Cf. Needham, IV(2), p.123). The Persian gin also had three rollers pressed against each other by a manipulation of wedges between their bearings. A rear roller was there to keep off the fibre from the main roller, but its first date of use is not certain (See Hans E. Wulff, Traditional Crafts of Persia, Cambridge, 1966, pp.179-80).


64. Ibid., pp.153.
board device and increased the production of cotton fibre considerably.

After the cotton has thus been ginned, its fibres need to be separated. Scutching not only loosens the texture of the cotton, it also removes the dirt and dust. One of the most primitive methods for achieving this was beating the cotton with a stick. An illustration of the late sixteenth century, 'Idris giving instruction to mankind in the art of weaving' shows the use of a stick for beating cotton (Pl.XI). Even by the seventeenth century, this mode of scutching cotton was found existing side by side with the carding bow. But beating cotton with a stick had its own hazards. Instead of loosening, it might break the fibres. Therefore, the bow-string device was much better. The vibrations of the string open the knots of the cotton, loosen and separate fibres of the plant material, instead of scutching where the fibres get broken.

There is some dispute about the origin of the bow-string device. Schlingloff has traced the first textual reference to it in one of the Jatakas


66. W. Foster, ed., *English Factories in India 1665-67*, Oxford, 1925, p.174, the cotton was said to be ‘bowed or beaten’.

where one reads *ithinam kappasapothanadhanukam* (i.e. a woman's bow for carding cotton). Vijaya Ramaswamy has also discovered reference to 'bowing' from the second century to sixth century A.D. *Trikandasesa*, a work of ninth century A.D. refers to its use.

D. Schilongloff identified a rectangular frame in the Ajanta fresco of the sixth century with the bow-string device. But a rectangular frame cannot perform the function of a bow, since it cannot produce the required vibration. This is only possible when the frame could have been bow shaped for it would then have the elementary aspect of a spring in the

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70. Purushottamadeva, *Trikandasesa*, Bombay, 1937, p.78. The sloka reads, ‘*Kapallasika tarkustarkushanastu Jhamaka Varantani tarkupithi syatpinjanam tulakarmukam*.’ I owe this information to Professor S.R. Sarma, Department of Sanskrit, A.M.U., Aligarh; K.N. Mahapatra “Purushotam Deva, The Lexicographer” *The Orissa Historical Research Journal*, II, Bhubaneswar, 1953, p.71, has traced the *Trikandasesa* to be a work of the ninth century AD.
vibrating wire, for loosening and separating the fibres instead of scutching.\textsuperscript{71} In fact, as already shown above the instrument depicted in the Ajanta fresco was really the \textit{charkhi} which has to have a rectangular frame.

India, thus, had a bow-string device well within the first millennium of the Christian era. Moti Chandra cites two dictionaries. \textit{Vijayanti} (eleventh century) and \textit{Abhidhanacintamani} (twelfth century) for reference to the bow-string device.\textsuperscript{72} The \textit{Miftahu'\textquoteright Fuzala} (fifteenth century) provides the earliest description and depictions of it along with the mallet in two illustrations (Pls.IV & V).\textsuperscript{73} Both the bows are identical in shape. Each bow consists of a round wooden bow shaft. The shape of the top of the bow is like the neck of the harp, and the bottom is made by a board which is possibly inserted into the slot of a round board carrier and the whole is attached to the shaft. A strong bow-string runs from top to the bottom of the foot-board of the bow. But both the illustrations do not show any toggle-peg which is usually placed between the strings to achieve rough tightening by twisting it. Apart from it, the leathern block between string and foot-board for final adjustment is also absent. A sling

\textsuperscript{71} Needham, IV(2), p.127.

\textsuperscript{72} Moti Chandra, \textit{Costumes, Textiles, Cosmetics and Coiffure in Ancient and Medieval India}, Delhi, 1973, p.126.

\textsuperscript{73} \textit{Miftahu'\textquoteright Fuzala}, f.126b and f.259a; see also, Ishrat Alam, "Textile Tools as depicted in Ajanta and Mughal Paintings", pp.132-133.
of some material (perhaps of cotton yarn) is shown fastened to the bow-shaft near its centre of gravity. The bower passes one hand through this sling while working; it also protected his hand. The Miftahu’l Fuzala gives duruna, shafshahang, lorak and kaman naddaf as synonym for the bow-string device.\textsuperscript{74}

An important part of the bow-string device is the mallet. The Miftahu’l Fuzala gives the synonym of mushta(mallet) as shafshahang.\textsuperscript{75} The mallet is also depicted in both the illustrations of the bow-string device.\textsuperscript{76} The mallet has double tapering heads. In operation, the bower is depicted as holding it by the middle in his right hand (Pl.V). The ridge of the upper head grip the bow-string when the bower strikes the string with the mallet. When so struck, the bow-string becomes very tense and slips off the ridge. This results in strong vibrations, which help to loosen the cotton fibres.

India, thus, had a bow-string device in ancient times at least by 2nd century A.D.

Therefore, it could be safely assumed that the bow-string device radiated outwards from India to other cultures. Irfan Habib finds the earliest evidence for the Islamic World’s familiarity with it only in the

\textsuperscript{74} Miftahu’l Fuzala, s.v. duruna, shafshahang, lorak.

\textsuperscript{75} Ibid., s.v. shafshahang.

\textsuperscript{76} Ibid., f.126b and 259a.
eleventh century AD. China received it in the thirteenth century with cotton itself. Europe knew it only in the fifteenth century. In 1409, the wool workers of Constance had protested against its use for cleaning cotton.

The bow string device still survives in India practically as it was in medieval times. It is called dhanuki in Hindi from Sanskrit/Pali; dhanukam or dhunna from a different Sanskrit root dhu, which means to beat, ‘pummel’ – probably vigorous bearing like one with bow-string device, and the cotton-carder obviously being called dhunya in Hindi.

The carder (dhunya, naddaf) was an itinerant artisan who moved from ‘village to village’ with his family in search of work. Thevenot (1666)


80. Cf. Maulavi Zafrur Rehman Dehlavi, Farhang Istilahat-i Peshawaran, II, Delhi, 1940, pp.5-6. It is called dhunki apparently a variant of Sanskrit dhanukam.


82. Ibid.
writes, "We went next to Gitbag (near Sarkhej), five leagues from Mader, we met a great many Colies, which are a people of a Caste or tribe of Gentiles, who have no fixed Habitation, but wander from Village to Village, and carry all they have about with them. Their chief business is to pick and clean Cotten, and when they have no more to do in one village they go to another." 

It is therefore very likely that India was able to produce some of the finest cotton-cloth in the ancient and medieval period owing to its invention of the two basic tools of pre-modern textile industry, namely (1) the cotton-gin for cleaning cotton more efficiently, and (2) the bow-string, a device for carding cotton for disentangling fibres without damaging it much. These, in turn, might undoubtedly have caused a major increase in the production of fine cotton ready for smooth spinning.

**Spinning**

It is difficult to explain the origin of spinning technology. Spinning may be said to have its predecessor in cord making, from straw and plant fibres. Cords presumably had a spiral put into them by some kind of "twisting". These spirals added strength and elasticity to the material.

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84. Such twists could be achieved by rolling the raw material between the fingers, between the palm of the hands, or between the fingers and the thigh or the cheek. It is not easy to ascertain definitely as to which of the two methods of impressing the sherds (through the application of pressure directly on to the surface of the pot or the beater technique) was used, Dieter Kuhn, pp.63-64.
Similarly it is difficult to know as to who discovered that the plant and animal fibres were separable, though some tentative attempts have been made to explain it. Unlike Europe, Egypt, Mesopotamia and China, we do not find evidence of onos or epinetron (flat or semicylindrical) for hand spinning.

After simple twisting by hand, a crucial invention has been the spindle. Stone spindle-whorls were found in Telaitat Ghassul, Palestine, about 3000 BC. Small and convex limestone spindle whorls were discovered in Naqada, Egypt from about the same time, and from the first settlement of Troy, also dated about 3000 BC and the second settlement some 500 years later. The earliest European spindle whorls, made of stone, have been reported from Bielersee, Switzerland, from the middle of the third millennium BC. Bone, limestone, alabaster and basalt spindle whorls excavated at Meggido, Palestine, date from before 3500 BC to 1050 or 1100 BC. So far as India is concerned, it seems that the Indus civilization people were familiar with the suspended spindle spinning method in which the fibres could be gathered on the distaff or placed in a basket and then drawn out, fastened to the spindle and caught

85. Ibid.
86. Ibid.
87. Ibid.
88. Ibid., p.73.
under a hook. The feeding could be done regularly while the spindle rotated. Rotation was done by hand, then the spindle was dropped and thereafter allowed to swing. This free-flying spindle spinning method used to increase the momentum of the revolving mass of the whorl and in this way a fine, even yarn of some strength was obtained. Its antiquity is borne out by the numerous finds of spindle whorls in the Indus civilization. Spindle whorls were of varying types and materials. Small holes in the whorls were made for the use of metal. These spindle whorls were made of pottery, shell and faience. The pottery whorls were of three types:

(a) With a single hole in the middle
(b) With two holes in the middle
(c) With three holes in the middle.

Mostly, according to J. Marshall, wooden stick was used for the spindle. But E. Mackay suggested that spindles were chiefly metallic on the basis of the size of holes in most of the whorls. The two-holed type was found

89. E.J.H. Mackay, *Early Indus Civilization*, Delhi, 1976, p.82.


in Mesopotamia, early Elam and Turkistan, while the three-hole type is peculiar to the Indus valley civilization. Spindles varied considerably in size, varying from 1.25 inches to 2.1 inches in diameter.

Some of the two and three-holed whorls have a deep grooved edges which were perhaps used for drawing the thread along it to consolidate the fibres.

Spindle-whorls made of shell, were especially numerous in the Indus Civilization. Their size varied from 1.5 inches to 1.85 inches in diameter and their hole in the centre averaged 0.18 inch in diameter which was presumably because of the use of metal spindle. Spindle whorls of faience were very rare and also possibly had a metal spindle. The lighter nature of the whorls suggests that only fine yarns were spun with them. Wool could not be spun upon such whorls due to its great elasticity. Wool was possibly spun with large wooden whorls. Sometimes the

96. Ibid.
97. Ibid.
98. Ibid.
100. John Marshall, p.469.
spindle whorls were ornamented: pottery whorls with paint, faience with simple moulded designs, and shell whorls with incised lines.\textsuperscript{102}

In the \textit{Rigveda} (IX, 86.32) there is a reference to a triply twisted thread.\textsuperscript{103} Such triply twisted yarns could have been obtained with the help of three holed whorls. By the 4\textsuperscript{th}-3\textsuperscript{rd} century bone, ivory, stone and terracotta whorls came into use.\textsuperscript{104} Grinding stone was used for sharpening the spindle.\textsuperscript{105} Hemachandra (12\textsuperscript{th} century), speaks of the spindle as \textit{Tarku} and \textit{Kattansadhanam}.\textsuperscript{106} Spindles continued to remain in use in medieval period.\textsuperscript{107} In the 18\textsuperscript{th} century \textit{Bahar-i-Ajam} refers to their use.\textsuperscript{108} The role of spindle in finest spinning is well illustrated by the popularity enjoyed by muslin manufacture in the Dacca district.\textsuperscript{109} Very fine threads were

\begin{itemize}
\item \textsuperscript{102} Ibid.
\item \textsuperscript{103} Ralph T.H. Griffith, \textit{The Hymns of the Rigveda}, II( IX), 2nd edn., London, 1896, 86.32; see also M.A.Buch, \textit{Economic Life in Ancient India}, Baroda, 1924, p.111.
\item \textsuperscript{104} J.Marshall, \textit{Taxila}, II, Cambridge, 1951, pp.105, 661-662.
\item \textsuperscript{105} \textit{Trikandasesa}, p.78. Grinding stone was known as ‘\textit{Tarkushana}’.
\item \textsuperscript{107} \textit{Miftahu’l Fuzala}, s.v. \textit{shokak wa sangok}, f. 188 a-b.
\item \textsuperscript{108} \textit{Bahar-i-Ajam}, s.v. \textit{duk}.
\item \textsuperscript{109} Wilfred H. Schoff, \textit{Periplus of the Erythrean Sea}, 1st pub., 1912, rep. Delhi, 1974, p.47.
\end{itemize}
used in the preparation of ancient India's legendary muslin. Such fine thread was possible with the employment of lightest spindle, it could not in later times be spun on the spinning wheel.

The fineness and strength of the fibre to be converted into yarn depended on the sizes, shapes and weights of spindle whorls and the length of the spindle rods. The tensile strength of the yarns depends entirely on the number of rotations of the whorls.

The *Miftahu'l Fuzala* describes *shokak* or *sangok* as the whorl holder in which the spindle (*duk*) is rotated, the whorl-holder called *phirki* in Hindi. The *Bahar-i Ajam* explains *duk* or spindle as a long (*mustati*) piece of wood under which another piece of wood is attached and that iron or wood is rotated by both hands, so that short (*khurd*) silk or wool is twisted (*tafta bashad*). The two bits of wood or one bit of wood and one of iron in this definition refer to the whorl of the spindle containing

10. Moti Chandra, p.130. The Arab merchant Sulayman (851AD) refers to the fine muslin of Bengal. In praise of the stuff he writes, "In that country are made cloths which are not made anywhere else. One of these garments could pass through a ring because the stuff is extremely fine. The stuff is cotton.......


the spindle, the *phirki*, of the *Miftahu’l Fuzala*. The whorl greatly increases the speed of the spindle, leading to the more rapid spinning of yarn.

So far presence of spindle wheel in India is concerned, we have not come across any evidence for the existence of the spinning-wheel in ancient India. J. Marshall took the presence of an iron-axle for the existence of the spinning wheel.\(^1\) Lynn White was the first to insist on the absence of the spinning wheel in ancient India.\(^2\) The spinning-wheel with its belt-transmission of power, the flywheel and differential speeds of rotation originated in China during the Western Han Dynasty (206 BC-AD 24).\(^3\) Needham has discovered an illustration in China as early as AD 1035.\(^4\) The Islamic world received it in the twelfth century.\(^5\) Ahmad J. al-Hasan and Donald R. Hill have suggested that


\(^2\) Lynn White, “Tibet, India and Malaya as Sources of Western Medieval Technology”, *American History Review*, LXV(3), 1960, p.517.

\(^3\) Gao Hanyu and Shi Bokui in *Ancient China’s Technology and Science*, Beijing, 1983, pp.504-08, and thus antedates Needham’s suggestion of its origin in China after the second century AD (see Needham, IV(2), p.105).


the Arabs introduced the spinning wheel in Europe during the tenth century AD.\textsuperscript{120} At the same time they are not fully convinced of their identification because they also suggest that it could also well have been a silk-thread, multi-spindle throwing or twisting machine.\textsuperscript{121} However, there are clear references to a spinning wheel (\textit{charkha}, lit. wheel) in the works of Persian poets like Anwari (fl.1138-9), Nizami (d.1199-1200) and Sa‘de (1257).\textsuperscript{122} Irfan Habib, therefore, has suggested the spinning wheel reached the Islamic world by the twelfth century,\textsuperscript{123} and thus the Islamic civilization seems to have been the first outside China to accept her superb invention.\textsuperscript{124} Subsequently, it travelled to Europe in the thirteenth century. Lynn White found the evidence for its first appearance in 1280 at Spyer on the basis of which he had assumed it to be an invention of Europe.\textsuperscript{125} Now in the light of above discussion it seems that Europe probably received it through the Islamic world.\textsuperscript{126} India too

\textsuperscript{120} Ahmad J. al-Hassan and Donald R. Hill, \textit{Islamic Technology, An Illustrated History}, Cambridge, 1986, pp.185-86.

\textsuperscript{121} Ibid.

\textsuperscript{122} Irfan Habib, “Medieval Technology: Exchanges between India and the Islamic World”, pp.203-04.

\textsuperscript{123} Ibid.

\textsuperscript{124} Ibid.


\textsuperscript{126} Irfan Habib, “Medieval Technology: Exchanges between India and the Islamic World”, p.204.
received it from the Islamic source. I27 Irfan Habib has traced the earliest reference to it in India in the *Futuh-us Salatin* (1350) of Isami. I28 The *Miftahu'l Fuzala* (1468-69) refers to spinning by wheel. I29 and, there is an illustration in it of spinning wheel, which is perhaps the first illustration of it in India (Pl.VI). I30 The use of the spinning wheel is continuously attested to in later times by its depictions and descriptions. I31

127. Ibid.


“That woman alone is good, who works all the time with the *charkha* (spinning-wheel); for a seat of honour would deprive her of her reason.

Let cotton (*pamba*) be the woman’s companion, grief her wine-cup, and the twang of the spindle will serve well for her minstrel.”

129. *Miftahu'l Fuzala*, f. 94b, s.v. *charkh*.

130. Ibid., f.151a.

The spinning-wheel incorporated power-transmission by 'wrapping-connection'. It embodied one of the earliest uses of fly wheel principle and differential speeds of rotation. The belt drive was essential to the main motion in this apparatus.

Medieval paintings (16th century and later) reveal that rimless spinning wheels were used. In them the outwardly diverging spokes were connected by thin cords to form a 'cat's cradle' which carried the driving belt.

The introduction of crank arm or eccentric lug into spinning-wheel added greatly to the convenience of working the spinning wheel. Needham has traced the antiquity of crank-handle in a rotary winnowing fan of prior to 2nd century A.D. in China. It reached Europe in 9th century A.D.

In China, crank-handle was attached to the reeling-wheel (the ancestor of the spinning-wheel) and naturally enough to the spinning wheel in the 13th century, when the device was used to spin cotton. It is

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133. Ibid.

134. Lynn White, p.110.

not clear if the spinning-wheel originally travelled from China with crank-handle or the Chinese reeling-wheel gave birth to spinning-wheel in other cultures, and the crank was applied there at a later stage. Shadiabadi’s depiction does not show any handle on the wheel, either on its rim or its face (Pl.VI). In one of the two spinning-wheels shown in Harivamsa (1590-95), the crank-handle is not visible and may well be absent (Pl.VII). The depiction of spinning-wheels, in an unsigned miniature of Jahangir’s atelier, can not be taken as the representative of their counterpart in Mughal India; the miniature being drawn after the Persian example (original not known); but the wheels yet lack handles (Pl.VIII). In another spinning-wheel depicted by Bichitr during Jahangir’s reign, a half-handle with a hole for a small wooden peg handle can be seen. A miniature of Aurangzeb’s reign (1658-1707) display a spinning-wheel where a piece of wood mounted on the axle at an angle is visible.


139. Ivan Stchoukine, La Peinture Indienne à L’Epoque des Grands Moghols, Paris, 1928, Pl. XLV (c. 1620-25).

could have been capable of performing the office of crank. Another mid-18th century (1760) painting shows the crank-handle clearly (Pl.IX). A further improvement was achieved by fitting a connecting-rod to the crank-handle by the mid-18th century. In Europe, however, the connecting-rod was developed as early as in the 15th century. Moreover, India never received the multi-spindle-wheels illustrated in China from 1313 onwards or the U-shaped flyer rotating around the spindle attached to it in Europe by 1480.

Thus, in all likelihood, the gap between the fast production of cotton-fibre after being ginned by the cotton-gin and carded by the bow-string device and the not so rapid spinning by the spindle was filled by the addition of the spinning wheel to pre-modern Indian cotton technology. In one sense the impact of this conglomeration of cotton gin, bow-string device and spinning wheel should have been considerable on the cloth production, and consequently on the economy and society of medieval India.


143. Lynn White, p.113.

Preparation of Yarn /Fibre for Weaving:

Some evidence is also available for the intermediary processes prior to weaving. Once the yarn was spun, it was transferred to the spool. In India, the earliest evidence of spool/bobbin have been reported from Mohenjodaro (4000 B.C.)\(^{145}\) Three bobbins were found; two of which were of steatite.\(^{146}\) They are of varying sizes and types.\(^{147}\) Miftahu’l Fuzala gives the illustration and explains it as ‘a wooden instrument on which cotton and silk yarn are wound, it is called pareti in Hindi’.\(^{148}\) This description is followed by an illustration of the same instrument (Pl.X).\(^{149}\)

From the cage spool or the winding stick the yarn was taken off as a skein. Shadiabadi again helps in understanding this when he describes the kalawa (a skein) thus, “As yarn is put on yarn, that is coiled (pechand) and that is called ate in Hindi.”\(^{150}\) This is the earliest and perhaps solitary

\(^{145}\) Mackay, *Further Excavations at Mohenjodaro*, p.420.

\(^{146}\) Ibid.

\(^{147}\) Ibid.

\(^{148}\) Miftahu’l Fuzala, s.v. kalaba. The Hindi equivalent pareti is still in use. It is called parenti or phirenti (*Istilahat-i-Peshawaran*), II, p.10, s.v. parenti, phirenti).

\(^{149}\) Ibid, f. 240a. The Bahar-i-Ajam’s description of the kalafa is similar: ‘a piece of wood on which yarn in wound and collected’ (s.v. kalafa).

\(^{150}\) Miftahu’l Fuzala, s.v. kalawa, f. 239b. Here again the continuance of the same equivalent upto modern times is very important in understandinmg the practice of the craft (*Istilahat-i-Peshawaran*), II, p.9, s.v. atti or anti).
evidence so far traced of the skeining.

Yarn was also collected in the form of coils from the cage-spool for dyeing prior to weaving. This is depicted in a later 16th century Mughal miniature. 'Idris giving instruction to the mankind in the art of weaving' (Pl.XI).151 A man is shown transferring the collected yarn from the cage-spool on to wooden pegs driven into the ground in a circular manner. The coiled yarn could be then collected and dyed.

Collection of yarn on the weft spool to be used in the shuttle was also a very important process prior to weaving. For weaving, the yarn is wound from the skein on a reed. The reed was pushed over the spindle head and the yarn was wound from skein on to the reed which served as the bobbin. The Miftahu'il Fuzala provides the earliest reference to it. Zaghuna was the obsolete word for it, and mashora was the word in use. Shadiabadi describes the bobbin (mashora) as "yarn (risman) which women arrange (sazand) in the shape of an egg on a spindle."152 He also describes the bobbin (mashora) elsewhere, where he says: "yarn is straightened (rast kunand) and yarn is put together (baham karda)."153 The Bahar-i Ajam gives more accurate definition and also relates it to the further process in weaving. It says, "Reed (mashora) is that on which

151. T. Falk and M. Archer, Pl. 3, Cat. 4, p.47.

152. Miftahu'il Fuzala, s.v. zaghuna, f.151a.

153. Ibid., s.v. mashora.
weavers wind yarn, pass (guzarand) it into the shuttle (maku)". The same dictionary also refers to a reel that 'weavers put (andakhta) yarn on, and put on the shuttle (maku), the braiders (ilaqaband) wind silk on it (kalafa charkhi)".

Warp winding was the next most important process prior to weaving. Warp winding in its simplest form is shown in the Mughal miniature in the manuscript of Ziauddin Nakshabi’s Tuti Nama (1580-85) where Zarir, the weaver of silk garments has been shown at his loom in Nishapur (Pl. XIII). A man is shown transferring the collected yarn from warp winding stick on to a number of warp pegs driven into the ground in a circular manner. Two pegs could be seen placed near each other possibly to achieve a warp cross. First, the warp winder attaches the end of the thread to the first warp peg and then carries on the business of passing the thread to the right and left of the cross pegs alternately, until the warp has the requisite number of threads.

In order to facilitate weaving, warps were sized to reduce friction and avoid damage to the threads during weaving. Shadiabadi describes the size (ahar) thus “It was bat or pat (size) that was put on the cobweb

154. Bahar-i-Ajam, s.v._mashora.

155. Ibid., s.v. kalafa charkhi.

156. See, Indian Heritage, Court Life and Arts Under Mughal Rule, Balding/Mansell, 1982, Pl.23, text on p.32. See the text (pp.195-6) and fig.(272) in Hans E. Wulff.
(tansta) of yarn". The description is accompanied by an illustration. The yarn is put horizontally and is supported at both ends by stout sticks driven into the ground. A man is depicted applying the size on the yarn with a brush (mala). Shadiabadi describes the brush (mala) as "a weaver's brush (simā), by which a weaver puts size upon yarn of the cloth, this is called kunchi in Hindi (Pl.XIV)." This is also clearly depicted in a late 16th century Mughal miniature (Pl.XI). Thus we find Hindi equivalents for these intermediary processes. This is perhaps owing to their knowledge in India prior to the advent of the Muslims. We do not find any evidence of warping with the help of cops. An Italian Manuscript of 1421 shows the familiarity of Italian weavers with warping a loom from as many as twelve cops.

WEAVING

The process of weaving consists of interlacing at right angles the two series of threads, the warp and the weft; the instrument by which this was done was the loom. The Indian weavers normally used the horizontal

157. Miftahu'l Fuzala, s.v. ahar, f.12b.

158. Ibid. f.12b.

159. Ibid. s.v. mala, ff.271b, 272a. The Hindi equivalent is still in use in common parlance, with slight modification (Istilahat-i-Peshawaran), II, p.83, s.v. kunch, It is also called full or iharii.

160. T.Falk and M. Archer, Pl.3, Cat.4, p.47.

throw-shuttle-type loom for the simple or tabby weave.

At what period in time weavers achieved methods of weaving patterns into the material, it is difficult to say, that the cotton of the Indus civilization is too thickly woven to have been produced by anything except the loom. Textual reference to the loom occur in Panini (fourth century BC) who uses the word tantra for the loom and pravani for shuttle. He tells us in the Bhashya of stretching the warp and then putting threads across it with a shuttle (astiarnan tantram, protam tantram). However, this does not help in understanding the nature of the loom. The earliest loom was perhaps horizontal. Wilhelm Rau has tried to trace this in a description in the Atharva veda. Simple horizontal looms were widely spread in ancient civilizations. By the end of twelfth century, the simple vertical loom was used in South India, for in 1184 there is an


163. V.S. Agrawala, India as known to Panini, Allahabad, 1953, pp.231-32.


165. Forbes, IV, pp.198-199.
inscriptional reference to "loom that are tied to the roof with a rope."\textsuperscript{166} Thus, the Indian weavers were familiar with both the simple horizontal and vertical loom in ancient India. One important aspect of the loom, the treadles – wherewith the shed, controlling sets of warp threads, are lifted or depressed – are a later addition. We do not find any evidence of it in the early Indian literature.\textsuperscript{167} Ancient India was not in possession of this device. There is a passage in Divyavadana (first century AD), which Moti Chandra has translated, "The weaver (kuvinda), while engaged in weaving cloth, picked and gathered the cloth and yarn (avicira-vicirakam) and with raised head (abivinirmay dudhasiraskha) and with the clapping movements of hands and feet (sphatitam pani pado) began the weaving operation".\textsuperscript{168} The 'clapping movements of hands and feet' could easily lead one to assume the use of looms fitted with treadles. However, Moti Chandra's rendering of the passage is doubtful. The term sphatitam means 'torn', 'lacerated', 'cracked'.\textsuperscript{169} Therefore, there is not even oblique reference to treadles. The loom treadles were in use in China in the second

\textsuperscript{166} Cited by Vijaya Ramaswamy, "Notes on Textile Technology in Medieval India with special Reference to the South", \textit{I.E.S.H.R.}, XVII(2), p.230.


\textsuperscript{168} Moti Chandra, p.29.

These were unknown in ancient Egypt and classical antiquity. Europe probably received the treadles along with the horizontal loom in the early twelfth century AD, as the period when treadles were used in Europe coincided with its knowledge of the horizontal loom. The period of the Islamic World's acquaintance with treadles is not certain. In India the earliest evidence possibly comes from Maulana Daud's reference to weaver's skill. He writes, 'Look at the profession (capability) of the weaver, [when] his hands lift up, [his] feet do not touch the ground'. It was possibly because his feet were on the treadles under them. Thus it is quite possible that it came into use in


173. Lynn White, p.117.


India during the thirteenth-fourteenth centuries. Later on, Shadiabadi (1468-69) defined it as **lauh-pay** (lit. foot-board) as “wooden strip which the weaver keeps under his feet while weaving cloth (s.v. lauh pay: Babay Parsi takhta kah julah zir-pay wa jama basad”).\(^{176}\) The treadles are also depicted in an illustration on this folio (Pl.XII).\(^{177}\) Thus, this change improved the ordinary horizontal loom. The treadles obviously made weaving easier. Now the weaver could sit on ground and put his feet on a pair of treadles with ease. Therefore from the sixteenth century onwards we find the weavers working on pitlooms. The pitloom is first depicted in a Mughal miniature in the manuscript of Ziauddin Nakhhabi’s *Tuti-Nama* (1580-85) (Pl.XIII).\(^{178}\) The treadles are also depicted in a late sixteenth century miniature, ‘Idris giving instructions to the mankind in the art of weaving’ (Pl.XI).\(^{179}\) They are further attested to by the seventeenth century depiction of the weaver saint Kabir in a Mughal miniature (Pl.XV).\(^{180}\) In view of the time it must have taken Indian weavers

\(^{176}\) *Miftahu’l Fuzala*, s.v. *lauh-pay*.

\(^{177}\) Ibid., f.262a; see also Norah M. Titley, p.18.

\(^{178}\) Manuscript is in Chester Beatty Library, Dublin, MS 21, f.79r, for reproduction see, *The Indian Heritage Court Life and Arts under Mughal Rule*, Balding/Mansell, 1982, pp.23, 32.

\(^{179}\) T. Falk and M. Archer, pl.3. Cat. 4, p.47.

in general to accept this technique, it would seem that foot treadles were introduced into India well before the fifteenth century. It is possible that the treadles of the loom reached India from China through the Islamic world.\textsuperscript{181} Given the treadles, the Indian loom was basically similar to the ordinary loom in use in Europe from thirteenth century onwards.\textsuperscript{182} A contemporary description of the loom is given by Wouter Schouten (1676) as in use on the Coromandel coast: “that at some places wel four or five thousand weavers reside, I had been to some of their small and dark houses, which are very modest cottages, (more like) pigsties than look little houses of the artists. Their loom was small, and of bamboos and reed, so light as an ingenuity can make; I saw the same mostly in low rooms, which are three or four feet below the earth. The trenchers were dug out there. The dark weavers of Coromandel, day and night take delivery of goods through the small holes. In this twilight was displayed what kind of artists they were. Yet not only the men but also the women in these countries know how to operate the weavingloom and earn (still in a better way than) their usual livelihood.”\textsuperscript{183} Until the advent of Kay’s fly-shuttle in the first half of the eighteenth century, this loom did not


\textsuperscript{182}. Forbes, IV, pp.214-215.

\textsuperscript{183}. Wouter Schouten, \textit{Oost Indische Voyagie}, Amsterdam, 1676, pp.293-94.
witness any basic development, even in England.

It is possible that the arrival of the footpedal in India coincided with the spinning wheel, also datable to the thirteenth-fourteenth centuries. But in the absence of clear evidence, this remains matter for speculation. Whenever this improvement might have occurred, it added greatly to the three motions of loom-shedding, shuttle manipulation and beating up, which would in turn have increased productivity considerably and also improved the quality of cloth production.

Fancy or complex weaves naturally required much greater manipulation in order to obtain the insertion of threads of various colours in the weft. One way to achieve colour patterns with simple looms was by the ‘patola’ technique.

The pre-dyeing of yarn to produce woven patterns seems to go back to very early times: Moti Chandra introduces us to vicitra-patolaka (variegated patola) in the Lalitavistara,^{184} a work of the first century AD.^{185} Phyllis Ackerman has traced its use in some of the costumes in the Ajanta cave paintings which are “unmistakably in ikat stripes.”^{186} The term patola also occurs among species of valuable fabrics obtained

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from Deogir in the fourteenth century.\footnote{Ziauddin Barani, *Tarikh-i- Firuzshahi*, ed. Saiyid Ahmad, Bib. Ind., Calcutta, 1862, p.223.}

It seems that ‘Patola’ was a special fabric of Gujarat town of Patan\footnote{E.F.I. 1618-21, pp.101-2; *E.F.I.*, 1646-50, p.161; The name of manufacturing town is spelt ‘pattinee’ which the editor identifies with Patan. Tavernier reports that ‘patoles’ were made of silk with flowers of different colours at Ahmadabad also, see Jean Baptiste Tavernier, *Travels in India*, tr. V. Ball, London, 1889, 2nd edn. of this tr., rev. William Crooke, London, 1925, 1st Indian edn., New Delhi, 1977, II, p.3.} although owing to the antiquity of the term, the similarity in names is totally accidental. ‘Patola’ is essentially a simple weave: only the warp and the weft are pre-dyed in sections to produce designs, as against complex weaves with threads each entirely of one colour where the two sides must be different from the other. In order to achieve the desired patterns, both warp and weft threads were tied and dyed in different lengths according to a planned design in the fabric. It is thus possible to produce fabrics with monochrome or polychrome ornamentation.\footnote{A Buhler and E. Fischer, *The Patola of Gujarat*, Basle, 1979, p.222.}

Notwithstanding the advantage thus gained, the Indian horizontal loom remained simple owing possibly to the absence of certain useful mechanisms. In the first place, the Indian horizontal loom perhaps did not incorporate the use of the lever by releasing which the warp was
periodically paid out and the woven cloth wound on the cloth beam.\footnote{190} This deficiency was probably met by the less efficient indigenous practice of bringing the warp closer to the weaver with the help of a string tied to a peg of breast-beam on the left side of the weaver. It is portrayed in all the available depictions of Indian horizontal loom, ranging from the fifteenth to the nineteenth century (Pls.XII, XIII & XIV & XV).\footnote{191} Secondly, we do not hear of the use of more than two treadles and a consequent multiplication of heddles. Such horizontal looms were operating as early as AD 1400 in Europe.\footnote{192} It seems quite possible that the absence of more heddles as well as treadles would have considerably limited the range of woven patterns. Another significant feature missing in the Indian horizontal loom is the use of two pegs on which warp beam was placed. Instead, the warp beam is straightened on one peg. Also, in

\footnote{190. R. Patterson in Singer, ed., \textit{History of Technology}, II, p.212 explains the use of lever in a loom from a thirteenth century manuscript.}

\footnote{191. Cf. \textit{Miftahu’l Fuzala}, f.262a (for fifteenth century); \textit{Indian Heritage}, Pl.23, (for the sixteenth century); Falk and Archer, Pl.3, Ct. 4 p.47 (for late sixteenth century); \textit{Album of India and Persian Miniatures}, Pl.66 (for seventeenth century); Col. J. Skinner, \textit{Tashrihu’l Aqwam} (AD 1825) (Rotograph), Br.Mus. Add. 27, 255, f. 51 & Painting of weaver with the loom on opp. p.244 (for early nineteenth century). The warps are tied to a warp beam and the warp beam was tied to pair of strings (or ropes) which were used to move the warp closer to the weaver. The string is not indicated but the chances of a lever mechanism is not possible on the loom depicted.}

\footnote{192. Lynn White, p.118.}
none of the depictions do we find any evidence of the use of a pulley to operate the heddles. At Boppard (Rhineland) in Europe, by the thirteenth century even the pulley was being replaced by an overhead spring in conjunction with treadles. The more primitive techniques of the Indian horizontal loom naturally had an adverse effect on its efficiency. The Indian weavers employed the subtest tricks for saving on cotton and providing some width to the cloth on this loom. This was done by manipulating the construction of reeds which helped in manipulating the warp threads. Georges Roques (1678-86) informs us that the weavers had four kinds of reeds. The first kind consisted of equal gaps. In the second the gaps were put in the middle, the third had gaps twice more than the second one, and the fourth took away one full vissa (one hundred and sixty threads in the warp).

A pattern achieved through complex weave demanded a different weaving technique than either for the simple weave or its patola variation. This was achieved best of all in the draw-loom. The draw loom multiplies the number of sheds which are controlled by cords pulled by a person assisting the weaver. Although figured silks, cottons and brocades of the highest quality were woven in India, it is not certain that ancient India ever had a draw-loom. Vijaya Ramaswamy’s suggestion that the draw-

193. Ibid.

loom was known in South India in the 11th century is not based on a clear identification of the term *achchutari* with the draw-loom since *tari* means loom and *achchu* means mould or print only.\(^{195}\)

Thus, there is a view that India was familiar with the draw-loom or pattern loom as early as eleventh century.\(^{196}\) But the evidence for this seems inadequate. The use of the compound word *achchutari* induces Vijaya Ramaswamy to suggest that the drawloom was indicated. This could possibly refer to a loom where more harnesses are attached for a more detailed control of the warps.\(^{197}\) Besides, nothing is said of figured patterns. Had India of the eleventh century been familiar with the drawloom, before the arrival of the Muslims, the weavers’ guild would not have decided in 1538 that “this mode of weaving should be done only by the Muslims”,\(^{198}\) in lieu of which they were authorized “to collect


\(^{196}\) Ibid., p.232. Ramaswamy thinks that *achchutari* refers ‘to the process by which certain cords are attached to the wooden frame on top of the loom, and patterns are produced by pulling the cords in a correct sequence (by an assistant) while the weaver threw the shuttle through the resultant sheds. There is no evidence for this explanation (Ibid., p.232). P. Shanmugam, “Textile Production during Vijayanagar Rule” in K.A. Manikumar, ed., *Essays in Honour of Prof. S. Kadhirvel, History and Society*, Madras, 1996, pp.45-47, also finds it difficult to accept the term *achchutari* identified as drawloom.

\(^{197}\) Forbes, IV, p.218.

\(^{198}\) Cited by Ramaswamy, “Notes on the Textile Technology in Medieval India with special reference to South India” *I.E.S.H.R.*, \(\ldots\)
the income from the gifted lands for their weaving”.¹⁹⁹ This regulation did not only forbid its practice but also prescribed fines and punishment for any violation of it by the native weavers in the whole of South India.²⁰⁰

The Chinese were in earlier times most advanced in loom construction, especially in the evolution of drawloom. They already had the essentials of drawloom developed as early as the first century if not the fourth.²⁰¹ India possibly received it from Iran, where the term for drawloom is dastgah-i naqshbandi, dastgah-i zaribaf.²⁰² If the term naqshband exclusively means drawloom weaver, then the drawloom arrived in India in the thirteenth-fourteenth centuries probably from Iran. Another source of diffusion could also have been China because Isami (1350) speaks of the arrival of “Chinese naqshbands” (Chinese pattern weavers) at Iltutmish’s Delhi.²⁰³ Muhammad Tughlaq was reported to have employed

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XVII(2), p.233, for arguing in favour of the presence of drawloom in the eleventh century.

199. Ibid.

200. Ibid.


500 manufacturers of golden tissues, who wove gold brocades.\textsuperscript{204} This was perhaps a new and expensive loom, because the two references we have relate to two kings. The next reference to drawloom is implied in Abul Fazl’s reference to a certain weaver named Ghiyas Naqshband.\textsuperscript{205} The reference to a weaver in the \textit{A’in-i Akbari} reflects not only Akbar’s interest in the craft but also the esteem in which it was held. Did it have only limited use in medieval times, because it was more expensive in comparison to ordinary looms? The use of the drawloom survived into modern times for we have a clear description of the drawloom in the last decade of the nineteenth century at Murshidabad.\textsuperscript{206} The Murshidabad loom had a draw harness which operated on the figure warp only. It consisted of a large number of vertical draw strings. Each draw string was connected to a horizontal gut string in a cross harness. With the lifting of one draw string, the cross harness gut string was lifted and with it mails attached to warp threads were raised, the resulting pattern could be repeated. Besides, the reference to the drawboy sitting on an elevated platform manipulating the draw strings makes the identification with the drawloom beyond dispute. Therefore, if the \textit{naqshband} distinctly

\textsuperscript{204} Shihabuddin Abu Abbas Ahmad, \textit{Masalikul Absar fi Mamalikul Amsar}, Appendix C, in H.M. Elliot and J. Dowson, \textit{The History of India as Told by its own Historians}, III, 1st pub. 1867-1877, rep. Delhi, 1990, p.578.

\textsuperscript{205} \textit{A’in-i Akbari}, I, p.101.

means a weaver working with the drawloom, it could have been introduced in India as early as the thirteenth-fourteenth century possibly from Iran. Another reason behind our acceptance of Iran as the source of dissemination of drawloom technology is the structural similarity between the two devices whereas the alternate Chinese model was quite complicated, with fifty to sixty heddles and identical number of treadles as early as the third century AD. In the third century the multiplicity of heddles and treadles were reduced to the manageable number of twelve in a drawloom by an ingenious inventor Ma Chun (fl.269 AD). On the basis of available evidence, Iran seems to have been the only source of dispersal of drawloom to India. All these suggest that the drawloom and this particular technique was a recent arrival, which probably came with the Muslims.

What is surprising still is the limited use to which the drawloom was put. At Dacca and in Kashmir, where the complicated designs of the fabrics might make one expect its use, it is not found. At Dacca, J. Taylor found as late as 1800 that Indian weavers wove flowered cloth on the ordinary throw-shuttle horizontal loom. Two weavers put a number of threads desired for the flowers or parts of the design to be formed. They


208. Ibid.

drew each of these threads between as many threads of the warp as might be equal to the breadth of the part of the flower or design desired. The weavers would laboriously count and lift together the opposite numbers of warp threads through a bamboo stick, before throwing the shuttle. In this way, the Jamdani or flowered cloth was woven in the ordinary throw-shuttle-horizontal loom.

**Shawls and Carpets**

So far as the weaving of shawl is concerned, it seems that Kashmir had a monopoly of it prior to Akbar’s times, for Abul Fazl writes, that previously they were brought from Kashmir.\(^{210}\) Akbar is given credit for encouraging the manufacture of shawls in Kashmir.\(^{211}\) Not only that, by the last decade of the sixteenth century, Lahore had ‘more than a thousand workshops’ presumably to weave shawls.\(^{212}\) Lahore had become famous for weaving of a particular kind of shawl called *mayan* which was a mix of silk and wool.\(^{213}\) They were used for *chiras* (turbans), *fotas* (loinbands), etc.\(^{214}\)

Essentially the same technique prevailed for weaving patterned shawls in Kashmir, of which Moorcroft and Trebeck (1822) have given

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\(^{210}\) *Ain-i Akbari*, I, p.104.

\(^{211}\) Ibid.

\(^{212}\) Ibid.

\(^{213}\) Ibid.

\(^{214}\) Ibid.
a careful description. They remarked that the loom of Kashmir did not differ in principle from that of Europe. In the first place, the warp was fixed in the loom. Now the Naqqash or pattern drawer drew the pattern in black and white; the tarah guru settled the colours and threads; and the talim guru wrote his directions in shorthand and used to deliver a copy of the document to the weavers to follow in arranging the various coloured threads for the weft. The weft threads were then knotted to the warp. The face or right side of the cloth was placed next to the ground, the work was carried on at the back or reverse, on which the needles were hung in a row. Their number differed from four hundred to fifteen hundred, according to the nature of embroidery. In weaving, each weft thread knotted to the warp was separately led across the warp threads by a needle, according to the directions of tarah guru. Here too, therefore, there was no drawloom and each weft threads was led through the warp threads by guiding the needle directly by the hand.

Carpet weaving was an important industrial craft in medieval India, apparently, much influenced in its technique by Persia. In Iran itself, carpet weaving was practised as early as 6th-7th century A.D. References to carpet-weaving in India before the Mughals are rather rare. Abul Fazl


says that during Akbar's reign, Akbar took care to appoint experienced
workmen to weave carpets of wonderful varieties and charming textures
in imperial workshops.217 Chief centres were located in Agra,218 Fatehpur,219
Jaunpur,220 Zafarabad,221 Alvar,222 and Lahore.223 Ahmadabad in Gujarat
was particularly famous for carpets of gold and silver and silk.224 Pile
carpet weaving had spread to as far as Ellur in Deccan in the 16th century.225
Muhammad Kazim refers to the pile carpet weaving in Assam in the 17th
century wherein he writes of pari, as thick (gunda) cloth, with much
pile (purz), woven from thread (risman) used for covering the floor.226


224. Pelsaert, p.19; Thevenot, p.17.


The author of the *Bahar-i-Ajam* (1740) describes "pari" as the "name of valuable cloth (qumash) which is very nice and soft, and has plush (khwabagi) like velvet; it is multicoloured and they make pillows and floor coverings of it". This somewhat recent import of technique and its rapid extension to so many places suggests an expansion in demand for this commodity. This logical assumption finds further support when in 1679 Streynsham Master observes at Ellur, Andhra Pradesh, the manufacture of carpets on vertical looms (pile carpet weaving) with coloured woollen wefts woven in accordance with patterns set on paper. His observation that this industry had been established a century earlier by Persian immigrants, further strengthens the contention that the technique referred to earlier (1558) was a recent importation and possibly referred to pile carpet weaving on the vertical loom. He writes, 'The Loome is stretched right up and downe, made of cotton thread, and the Carpett wrought upon them with the woollen yarne of severall collours by young boys of 8 to 12 yeares old, a man with the paterne of the worke drawne upon paper, standing at the backside of the carpett, and directing the Booyes that works it how much of each collour of yarne should be wrought in. An every thread being wrought, they share it with a pair of sizers, and then proceed to the next'. His observation that "every thread

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228. Streynsham Master, *Diaries of Streynsham Master 1675-1680 and other Contemporary Papers relating thereto*, ed., R.C. Temple,
being wrought, they share it with a pair of sizers, and then proceed to the
next";\(^{229}\) makes the identification certain. In pile carpet weaving, this
technique of cutting the thread end of the tightened knot, with a "pair of
sizers' is apparently very close to the Persian method of weaving pile
carpets.\(^{230}\) It seems that Persian weaving technique and tools were
imported during the sixteenth century. As late as first half of 20\(^{th}\) century,
Persians were held responsible for introducing the vertical loom used for
qalin manufacture in Bihar.\(^{231}\) Moorcroft and Trebeck describe carpet-
weaving with vertical looms in a manner very similar to the one observed
by Streynsham Master at Ellur.\(^{232}\) That too might be construed as
belonging to the Persian zone of influence.

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London, 1911, II, p.171. Any identification of this pile carpet
weaving vertical loom with drawloom proper will be grossly
misleading as they employ different techniques which apparently
look similar. Vijaya Ramaswamy has fallen into this temptation of
oversimplified identification, *P.I.H.C.*, pp.453-54) the details of
the techniques of drawloom, are discussed by Hans E. Wulff,
pp.205-217.

229. Ibid.

230. See Hans E. Wulff, pp.214-16 for a detailed description of this
craft.

231. N.G. Mukarji, *Carpet Weaving in Bengal*, Calcutta, 1907, pt.1,
description of the loom, pp.16-19, See also G. Watt, *Indian Art at
Delhi 1903*, Pl.55, opposite p.430.

In another region, where the Persian technique could have come during the fifteenth-sixteenth century, was Kashmir. During Zainul Abidin's reign (1459-70), a large number of artisans adept in original designs had arrived in Kashmir. The Kashmiris mastered the intricacies of shuttle (turi) and looms (vema) started weaving beautiful and costly silks. "The special woollen textiles of foreign origin were woven by the Kashmiris." The painters seeing the patterns (citra) and creeper designs (latakritih) obtained by intricate weaving process (vicitravyayan) are reduced to silence as the figures in a painting. But the loom is not described. This could be a reference to the look described in the classic account of Moorcroft and Trebeck, 1822.

Prior to the application of any dye to the woven cloth, it was washed and bleached. Tavernier (1667) emphasises the use of lemon in bleaching

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236. Ibid., VI, p.30.


cotton. Roques in his account refers to 'half-bleaching'. Elsewhere he advises to wash the cloth to remove its mash which fills up the gaps. He says, that 'by beating the cloth with a thick wooden mallet, they crush its (canji) grains which get congealed with the mash, and gives body to the piece of cloth.'

239. Tavernier, II, p.5.


241. Tavernier, II, p.3.
2. SILKS AND SERICULTURE

Silk industry in India has been divided into two important categories: (a) the silk produced by the domesticated or mulberry-feeding, and (b) that by wild or non-mulberry-feeding worms, though some worms of the latter categories have been completely domesticated in India as well as in China.\(^1\) The first category is called the Bombycidae and the second the Saturnidae. The chief Indian Bombycidae silks are subdivided into four sub-groups. viz., (I) Bombyx (II) Ocinara, (III) Theophila and (IV) Trilocha.\(^2\)

The true mulberry-silk belonged to the Bombyx sub-group. Their habitats and their chances of utilization were explored by several persons over a number of years mainly in the 19th century. The earliest evidence of wild silk comes from Nevasa (1500-1050 BC).\(^3\) In recent past, some attempts have been made to identify India as the homeland of sericulture proper. We have tried to check those assertions in the light of hard facts available to us in literature. Hutton had asserted as early as 1864 that all the domesticated forms of the mulberry-feeding insects came to India


\(^2\) For their distinguishing characteristics, see, *D.E.P.I.*, VI (3), pp.2-6, 67-96.

\(^3\) Bridget and Raymond Allchin, *The Birth of Indian Civilization*, Suffolk, 1968, p.179; Bridget and Raymond Allchin, *The Rise of Civilization in India and Pakistan*, Delhi, 1983, p.276. They have revised their earlier suggested date of 1375-1050 B.C to 1500-1050 B.C.
from China. He was of the opinion that they had originated in the northern, colder tracts of India and were thus exotics in the tropical districts of Bengal. This change of climate led to degeneration and disease. Therefore instead of periodic renewal of stock, he had suggested transfer of its cultivation from Bengal to northern colder tracts of Punjab and North West Provinces. N.G. Mookerji, on the contrary, held that all the domesticated mulberry insects originated on unidentified slopes of the Himalayas.

D.C. Sarkar went a little further and suggested that the Indian Bombyx Mori may have developed from Bombyx (Theophilia) religiosae, an indigenous wild mulberry silkworm widely distributed in the Himalayas. His suggestion is based on the possibility of a range of mutations over successive generations. M.A. Buch thought that silk was probably introduced into India from China about the fourth century BC. Lallanji Gopal, on the basis of his survey of ancient texts had also

5. Ibid., p.24.
7. M.A. Buch, Economic Life in Ancient India, Baroda, 1924, pp. 120-122. See also, Sushil Malti Devi, Economic Condition of Ancient India (From A.D. 750 to A.D. 1200), Delhi, 1987, pp. 76-79.
suggested 'great antiquity' for silk industry in India. He holds that mulberry fed silkworms were introduced from China into India sometime during the fourth century B.C. Lotika Varadarajan argues that cultivated silk derived from the mulberry fed worm was localised to the eastern sector and obtained prominence in a period after the compilation of the *Arthasastra*, she identified the worm as Bombyx fortunatus i.e. the Bengal *desi*, multivoltine one associated with cold season yielding a golden yellow cocoon.

According to her Bengal had the Bombyx mulberry feeding worm sometime between seventh century and eleventh century A.D. It was transmitted to Assam along with the migration of a Bengal weaving community, called *Katani jugis* in the 12th century. She considers that the Bodos served as intermediaries in the trade between China and the north east and Bengal. She bases her argument on the assumption that


12. Ibid., p. 569.

13. Ibid., p. 566.

14. Ibid.
the Bodos, a Tibeto-Burman group, were traditionally associated with silk weaving. Elsewhere she considers them responsible for the dissemination of wild silk in north eastern and eastern India.\textsuperscript{15} She identifies the Bodos as the Kirata of Sanskrit literature.\textsuperscript{16} Her identification of Kirata with Bodos is little perplexing for it was a generic term used for degraded mountain tribe in general.\textsuperscript{17} Secondly we hardly find direct evidence of association of Bodos with sericulture in any inscriptive or any other literary evidence. For example as early as ninth century A.D. the Sagar Tal (Gwalior) inscription of Pratihara king Vatsaraja speaks about capture of hill forts of Kiratas amongst his extensive achievements without identifying them with any practice of sericulture.\textsuperscript{18} We could trace earliest reference to Kiratas in \textit{Manusmriti} (c.200 BC -- AD 200) as one of the twelve mixed castes branching off from the principal \textit{Kshatriya}

15. Kirata were not exclusively Bodos. They could also be a Tipera or Tripura tribe (see K.S. Singh, ed., \textit{People of India, Tripura}, XII, Calcutta, 1996, p.7. Besides, the Kiratas of ancient times were hardly familiar with silk and not confined to North East of India alone. They are represented as wearing skins. The presents they had sent to Yudhisthira represented the products of their country: these were skins, precious stones and gold, See Moti Chandra, \textit{Geographical and Economic Studies in the Mahabharata: Upayana Parva}, Lucknow, 1945, pp.84-85.


caste without their any association with any particular occupation. As early as 10th century AD we hear from Sravana-Belgola epitaph of Mahasinha I (980 AD) that the Gurjara king Satyavaaka – Kongunivarman “dispersed the bands of the .... Kiratas who dwell on the outskirts of the forests of the Vindhyan mountains (emphasis added) ....”.

The location of the Kiratas in the Vindhyan range assumes additional significance in the sense that it was never known to have been a mulberry silk producing area.

Undoubtedly the agency of man in the causation and diffusion of certain forms of life is great, but it does not follow that he had necessarily carried to remote sections of the tribal area the genera or species of moths, from a long list of whose useless forms, one alone came to be recognised and selected for human purpose.

Secondly according to traditions prevailing in 19th century, Manipur silk

19. A.C. Burnell, tr., The Ordinances of Manu, compiled & ed., Edward W. Hopkins, 1st pub. 1884, 2nd edn., Delhi, 1995, pp.310- (X: 43, 44); See also, Brajadalal Chattopadhyaya, Representing the Other Sanskrit Sources and the Muslims (Eighth to Fourteenth Century), Delhi, 1998, pp.41-42.


culture and manufacture was introduced from China and thus not from Bengal as claimed by Varadarajan, even if we accept that the migration of Katani jugis had taken place in the 12th century A.D. By the 19th century Manipur did possess the knowledge of mulberry silk culture though it was pursued on a limited scale. However we cannot be certain about the exact date of introduction of sericulture in Manipur in the absence of adequate evidence. Lallanji Gopal was the first to take note of the Yuktikalpataru evidence but he did not try to identify it with mulberry silk proper. Lotika Varadarajan elsewhere has relied heavily on the material from the Yuktikalpataru. The main problem regarding chronology of sericulture arises owing to her acceptance of this text as of eleventh century A.D. This is a controversial text and is considered to have been fabricated by someone under the name of Bhoja Parmara of


27. Ibid.
Dhara. It was actually a work of thirteenth century or even later.

Secondly, her acceptance of four caste division of cocoon silk and their identification with various silks is also questionable. The four-caste division of silk lies in the fact that it was a well accepted practice of classification of various crafts. Her rendering of the verse too is not correct. It does not say that Brahmana variety is small in size. Therefore the supposition of an allusion to *Bombyx fortunatus* appears to be a little far fetched. The verse states that “Those silkworms born in the southern marshy forests were the finest and whitest and were produced by the Brahmana silkworms”. The author of this verse is perhaps referring to the region covered by Bengal and Orissa.

28. See for a critical assessment of this text, Sreeramula Rajeswara Sarma, “The Sources and authorship of the *Yuktikalpataru*”, *Aligarh Journal of Oriental Studies*, III(I), Spring 1986, Aligarh, pp.39-54. It has been argued that the *Yuktikalpataru* is not a work of Bhoja Pramara of 11th century but that of an unknown compiler who had drawn heavily on the texts belonging to periods of as late as the thirteenth century.

29. Ibid.

30. Apart from Varahamihira, all *ratnasastaras* classify the diamond into four: Vipra, Ksatriya, Vaisya and Sudra, see S.R.Sarma, pp. 45-46; see also Moti Chandra, p. 66.

31. The silk from *Bombyx fortunatus* could not be exceptionally white. It is of a golden yellow colour. The *Yuktikalpataru* is very specific about the whiteness of the Brahmana variety. For the specific characteristics of *Bombyx fortunatus*, see *D.E.P.I.*, VI (3), p.2, 12. The cocoons were generally golden yellow in colour.

It is not possible to indentify this variety of silk with any of the Bombyx groups because they all yield yellowish thread. This was perhaps a reference to some other silk than Bombyx. The Yuktikalpataru in its classification of silks as four castes, does not refer to kshatriya caste, that is to say, second category of silks. The remaining three could possibly be identified as Brahman referring to Tasar silk, Vaishya to Muga and Sudra to Eri.

R.N. Saletore has asserted that silk was not only known but also cultivated in India a long time prior to Kautilya. At the same time he is conscious of the fact that raw silk was imported into India in the first century A.D. from Thinae (Sing Fanu) in China. The author of the Periplus of Erythraean Sea, which Saletore cites, is very clear about the source of origin of silk. It tells us that "there is a very great inland city called Thinae, from which raw silk and silk yarn and silk cloth are brought through Bactria to Barygaza (Baroch); these are also exported to Damirica by way of the river Ganges." But this was a difficult route and very few men came from there. The author of the Periplus thus makes it amply


34. R.N. Saletore, Early Indian Economic History, Bombay, 1973, p.268.

35. Ibid., p.383.


37. Ibid.
clear that silk was imported from China; and this was undoubtedly the cultivated mulberry variety of silk that reached India through Bactria. In India the raw silk was woven and then reexported through the ports of Barygaza and the regions of Ariana (Afghanistan). Ptolemy refers to the land route (through Ariana) in 150 A.D. In the famous lexicon Amarakosa, Amarsimha refers to Kausheyam Krimikoshotham. It seems that Gujarat had evolved as a major silk-weaving centre. In one of the inscriptions of Kumaragupta (473-4 A.D.) there is a reference to the immigration of a number of silk weavers from the Lata vishaya (southern Gujarat) to the city of Dasapura (Mandasor). Bana in early seventh

38. R.N. Saletore, p. 268.

39. Ibid.


century refers to the practice of using cloth made of Chinese silk at various places in the Harshacharita. Hemachandra in his Abhidhanachintamani (12th century) refers to the generic term Kausheyam as the product cocoons of insects. All these reference show that mulberry-silk was known, but it was an article of import, not yet an indigenous product.

The Arthasastra provides interesting information with regard to the silk-yielding regions of India: “The patorna-silk comes from the Magadhas, the Pundras and Suvanakudya. The naga-tree, the likucha, the bakula and the banyan tree are the sources. That from the Naga tree is yellow. That from the likucha is wheat-coloured. That from the bakula is white. The remaining one is of the colour of butter. Of these, that from Suvanakudya is best. By that are explained the silk and silk cloth from land of China.” This is a crucial passage in terms of identification

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43. Abhidhanachintamani, p.165, verse no. 333; see also, Harprasad Ray, Trade and Diplomacy in India China Relations, A Study of Bengal during the Fifteenth Century, Delhi, 1993, p.92.

44. R.P. Kangle, tr., The Kautilya’s Arthasastra, II, Delhi, 1986, pp.104-105.
of silk. The *Arthasastra* leaves no ground for any speculation while it refers to silk and cloth from the land of China.\textsuperscript{45} Next the references to the staple foods for the worms first the naga-tree, which could be *Mesua ferrea*, Linn. It is an evergreen tree, wild in the mountains of Eastern Bengal, the eastern Himalaya, Assam, and was widely cultivated. It was very common in Dinajpur and Rangpur districts of North Bengal.\textsuperscript{46} The second source of worm feeding on Likuca, was perhaps the *Artocarpus lakoocha*.\textsuperscript{47} The third tree *bakula*, was perhaps the *Mimusops Eleng*.\textsuperscript{48} the fourth, the *vata* tree, is the banyan tree, *Ficus Bengalensis*.

The mulberry tree is thus not involved. The reference to two common sources of *Patrorna* silk from a Magadh and Pundra indicates the productions of similar kind of silk from both regions. Magadh a covered a large area\textsuperscript{49} embracing a region famous for the production of

\textsuperscript{45} Ibid., p. 105.


\textsuperscript{47} *D.E.P.I.*, I, p.333; see also Lotika Varadarajan, op.cit., p. 566. Closely allied to the species of *Bombyx* (=the true mulberry feeding silk worms) was the *Theophila bengalensis, Hutton*. It was a wild silk worm of lower Bengal. Similarly, *Theophila affinis* could also be reared on the mulberry of *Artocarpus Lacoocha*; it was also a wild silk worm. See *D.E.P.I.*, VI (3), pp. 2-3.

\textsuperscript{48} *D.E.P.I.*, V, pp. 570-571.

Tasar silk.\(^{50}\) Pundra (=Pundravardhana) refers to North Bengal.\(^{51}\) There is no unanimity over the identification of Suwarnakudya.\(^{52}\) Here it is most likely that the area described really produced Tasar, Muga and Eri silks. *Patrona* need not be accepted as a reference to mulberry cultivated silk, because the *Amarkosa* gives it a special meaning of washed silk cloth as *Patrona dhauta Kausheyam*.\(^{53}\)

Xinru Liu is the latest addition to the debate about sericulture in India. She argues, on the basis of elves from contemporary literature and textile fragments from Central Asia\(^{54}\) that there is no evidence of origin of domesticated silk in India. Indians only acted as middlemen in the silk trade between China and the Mediterranean.\(^{55}\) In this capacity, they also kept some of the fabric for themselves.\(^{56}\) Besides, the Indians

\(^{50}\) Irfan Habib, *An Atlas of the Mughal Empire*, 10B, & 12B.


\(^{52}\) Lotika Varadarajan, “Silk identifications within the Indian traditions”, p. 197.


\(^{55}\) Ibid.

\(^{56}\) Ibid.
were familiar with some other varieties of silks.\textsuperscript{57}

Sometime during the 4-5th centuries Chinese monopoly in silk was challenged by Byzantine and Sassanian silk, and around this time Chinese silk textiles compensated the loss by gaining more consumers in India.\textsuperscript{58} There were two routes between India and China: (a) the route from the western India coast to the Gandhara region and (b) the one connecting the Gangas valley to China through the Kashmir region which gained importance after the mid fifth century.\textsuperscript{59} Yuan-Chwang had found popular use of silk clothes in the Takka region (in modern Punjab) and Satadru.\textsuperscript{60} Xinru Liu explains that the Indian demand for Chinese silk was owing to quality style and methods of processing. At Khotan in the seventeenth century the artisans did not unreel silk fibre before the moths had gnawed through their cocoons. It produced short fibre and consequently a different style of silk textile.

Xinru Liu suggests that artisans of the Gupta period had possibly adopted a different techniques of weaving than their Chinese counterparts; and Chinese silk technology rather spread from south-west China to India through Assam in the early Christian era. However she does not give

\textsuperscript{57} Ibid., p.69.
\textsuperscript{58} Ibid., p. 67.
\textsuperscript{59} Ibid.
\textsuperscript{60} Ibid., p. 68.
any source for such a route of diffusion. Nevertheless she also very rightly admits that much Indian silk was made from different species of silk worms other than the mulberry-worm. She notes that Chinese artisans had designed certain patterns like pearl-rounded designs, the rounds of lotuses, striped or chess board designs to meet the demand from India.

The evidence of silks from fragments found by Sir Aurel Stein in Central Asia were exclusively of Chinese origin and hence had nothing common with Indian silk. They dated form 300 A.D. to 8th century A.D.

The absence of any evidence of Indian silk can be explained by the fact that India was not familiar with mulberry silk during the period under discussion i.e. up to the 8th century A.D.

Another important region where sericulture came to be practised was Kashmir. The annual insect found in Kashmir was accepted as the true Bombyx mori. Thomas Watters, apparently committed a mistake in identifying Yuan Chwang's reference to kausheya as of the Bombyx mori variety. It is surprising to note that in the account of one of the

61. Ibid., pp. 68-69.
62. Ibid., pp. 72-75.
63. Ibid., pp. 71-72.
greatest of all the Buddhist-scholar diplomats who visited India (between 629-645 AD), there is scarcely any reference to sericulture in Kashmir if we check the internal evidence of the text. Yuan Chwang refers to Pai-tich (calico) or woollen cloths as the clothing material of the people of the region, from Udyana to Kashmir.\(^66\) Yuan Chwang gives a short general description of Kashmir, its people and products.\(^67\) He refers to local products and writes, “The district was a good agricultural one and produced abundant fruits and flowers: it yielded also horses of the dragon stock, saffron, lenses, and medicinal plants.... The people wore serge and cotton (pai-tich)...”. He does not refer to pure silk being produced or worn. He refers to clothes of Indians and refers explicitly to the use of wild silk. He writes, “Their garments are made of kau-she-ye (kauseya) and of cotton. Kiau-she-ye (kausheya) and of cotton, kiau-she-ye is the product of the wild silk worth.”\(^68\) His explanation of the term kiau-she-ye conclusively settles the problem. At other place, on the other hand, he noted that Khotan produced “silk of artistic texture”.\(^69\) It is possible that Kashmir did not begin to produce silk till the 15th century. It does not


\(^{67}\) Ibid., p.261.

\(^{68}\) Ibid.

\(^{69}\) Ibid., II, p. 295. He writes about Ku-Sa-Tan-va (Khotan), “The country produced rugs, fine felt, and silk of artistic texture....”
find a place in Alberuni’s description of Kashmir. There is no reference to silk production in Kalhana’s *Rajatarangini* though it refers to many of the important products of Kashmir. There is almost a unanimity of opinion among scholars that the domesticated rearing of silkworm had spread into Iran only just before Byzantium period, that is possibly by the 6th century A.D. It is to be remembered that the Chinese technical skill and artisans tended to travel far and wide. Chinese metallurgists and well-drillers were formed in 2nd century BC in Parthia and Ferghana and textile technologists, paper makers, goldsmiths and painters at Samarqand and Kufah in the 8th century A.D. Chinese artisans were demanded by the besieging Chin Tartars from Khaifeng in the 12th


Century. Similarly in the 13th century the Chinese traveller Chhiu Chhang - Chhun reported about the presence of Chinese workmen in large numbers from Shantung to Samarqand. He also reported a large number of settlements of Chinese artisans and craftsmen between Samarqand and the valley of the Upper Yenisei in the north. Such settlements of Chinese in Central Asian territories and their proximity with Iran must have facilitated the diffusion of certain techniques, and the culture of mulberry silk was presumably one of them. Persia had witnessed the second impetus to development of sericulture in Persia under Mongol rule (thirteenth-fourteenth centuries). That silk was an item of commerce between India from Iran and western Afghanistan in the 13th century is attested by Minhaj Siraj Juzjani. This might also have encouraged the Kashmiri silk weavers to produce their own mulberry silk.

If we correlate the information provided by Yuan Chwang and Srivara (1459-1486) it seems that the silk could well have been imported

74. Ibid.

75. Ibid.

76. Ibid.


from Khotan or even China till the 15th century. Srivara refers to influx of various craftsmen into Kashmir during Zainul Abidin’s reign.\textsuperscript{79} He writes that with the help of these craftsmen “Kashmiris could skillfully operate the shuttle and the loom and thus weave precious and attractive silk cloth”.\textsuperscript{80} But silk-weaving is, of course, different from silk-raising and Srivara also does not refer to the introduction of sericulture in Kashmir. It seems similarly, we do not find any reference to silk production in the very interesting account of Kashmir in Yazdi’s \textit{Zafarnama}, a work of early 15th century.\textsuperscript{81} But in India, despite its familiarity with a wide variety of the saturnidae group of silks, the earliest firm evidence for sericulture in Kashmir comes from Mirza Haider Dughlat’s \textit{Tarikh-i Rashidi}. (1547 A.D.).\textsuperscript{82} Thus the first firm evidence


\textsuperscript{80} Ibid., p. 237.


\textsuperscript{82} Mirza Muhammad Haidar, \textit{Tarikh-i Rashidi}, tr. E. Denison Ross, Patna, 1973, p. 425, observes, “Among the wonders of Kashmir are the quantities of mulberry trees, (cultivated) for their leaves, from which) is obtained [silk]”. See also, Walter R. Lawrence, \textit{The Valley of Kashmir}, London, 1895, pp. 366-367. C.E. Bates, \textit{A Gazetteer of Kashmir}, Delhi, 1980 edition, p. 61 refers to another tradition where it is said that the silk worm was introduced into Kashmir shortly before the reign of Emperor Akbar by Mirza Haidar of Kashgar who had imported eggs from Bokhara. It seems that this tradition arose out of the first literary reference to silk we find in Mirza Haidar Dughlat.
for sericulture in Kashmir is to be found in Mirza Haider Dughlat’s *Tarikh-i-Rashidi* (1547). It seems then that sericulture was introduced into Kashmir sometime during the 16th century. It could be reasonably ascribed to the spread of sericulture from Sinkiang (Xinjiang) via Gilgit and Baltistan (Little Tibet). This argument is further strengthened by the fact that the practice of importing eggs of the worms continued to be from the same route i.e. from Gilgit and Little Tibet till as late as the 16th century. In the Himalayan regions, Kumaun was another place where Abul Fazl reports about the practice of sericulture. It seems that the silk weavers of India especially of Kashmir were encouraged to pursue this profitable craft, and in turn to create a market for locally produced silk.

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83. Ibid.

84. Irfan Habib, “Note on Indian Textile Industry in the 17th Century”, pp.186-7; also his chapter, “Agrarian Economy”, in Tapan Raychaudhuri and Irfan Habib, eds., *The Cambridge Economic History of India (CEHI)*, I. The practice continued down to the 19th century, William Moorcroft and George Trebeck, II, p.155. They observed that silk was extensively raised in Khotan, and it extended from there to Kashmir through Yarkand and Balti.


silk. In the 17th century sericulture was noticed even in Sind.\textsuperscript{87}

Thus soon after its introduction, mulberry silk began to diffuse widely in India. It reached the western coast by the late 17th century.\textsuperscript{88} So far as the southern coast is concerned, it seems that some efforts were made to introduce it at Nagapattinam in the second half of the 17th century. But due to the hostile policy of the Naik, it was not possible for the peasants to leave any piece of land uncultivated. They were forced to cultivate paddy instead of planting mulberry and rearing of silkworms on it.\textsuperscript{89}

But the major silk-producing region was now Bengal. There seem to be no firm evidence for silk cultivation in Bengal before the specific


\textsuperscript{88} Irfan Habib, \textit{Agrarian System of Mughal India 1556-1707}, p.57. In a recent study of Coromandel Coast it has been stressed on the basis of Chauju-kua (late 12th century) that mulberry trees were grown in the Chola kingdom and coloured silk threads were woven into cloth and exported from ports (of south India). see, S. Jeyaseela Stephen, p.73. What surprises us is the fact that Chau-ju-kua refers very briefly to “cotton stuffs with coloured silk threads, and cotton stuffs” which hardly mentions mulberry silk, see P. Hirth and W.H. Rockhill, \textit{Chau-ju-kua: His work on the Chinese and Arab trade in the twelfth and thirteenth centuries, entitled chu-fauchi}, St. Petersburg, 1911, p.96.

reference to it by Ma Huan (1432 A.D.) in the 15th century. It seems that *Bombyx sinensis* variety of a small multivoltine mulberry silk worm was introduced into Bengal from China in the 14th-15th centuries and it initiated thereafter a rapid extension of the cultivation of mulberry trees. The manner in which mulberry (*morus*) trees were planted in Bengal was known to the Dutch as Bengal bush method.

The Dutch report tells us that the peasants used to take the old *tut* (mulberry trees) or small mulberry trees, cut them into small pieces of the length of a palm, land was ploughed up and tilled, and the small pieces were planted in October in the pot-holes across each other in a crosswise manner. Then they were covered with a little earth and straw. After the passage of a few days, the shoots became very green and these were plucked off daily for feeding the worms. Thus, the Bengal mulberry suited the multivoltine silkworm.

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90. "Mulberry trees, wild mulberry trees, silk-worms, and cocoons—all these they have, [but] can only make fine silks, embroidered silk kerchiefs and coarse silk; they do not know how to make silk-floss" (*Ma Huan, Yeng-yai Sheng-lan, The Overall Survey of the Ocean Shores*, transl. G.V.G. Mills, Cambridge, 1970, p. 163. It may be pointed out here that in spite of the later importance of Bengal as a silk producing region, till as late as the middle of the 14th century Ibn Battuta does not refer to silk among products of Bengal (Cf. Ibn Battuta, *The Rehla*, tr. Mahdi Husain, Baroda, 1953, pp.234-241 (Account of Bengal).


92. Ibid.
Very few particulars of the methods employed for silk-worm rearing have come down to us. It is, therefore, fortunate that the Dutch report (19 March, 1683) tells us about as many as seven ‘bunds’. It says that the names of the ‘bunds’ (harvest) of silk was characterised by successive harvests in a year in addition to their qualities. First bund was called “ageny” (aghan), falling in January and February, being well the largest and best of the year, is good yellow, that does not fade.

“Tzeyt (Chait), in the month of March, very small, still nearly as good as ageny, the colour little less.”

“Bezacq (Vaisakha) in the month of April and May, large and of good quality, but not so good as the previous two bunds.”

“Azaar (asadha), in June and upto half July, falling usually in the rainy season, being bad and colourless.

“Sauwen (sravana), from half of July to the end of August, falling good, thus none is allowed during rainy season, is obtained in good quantity”.

“Aszin (Asvina), September and half of October, bad and is of no significance.”

“Katch (Karttika), from half of October to the end of December,

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very small, still better in colour than of Aghani.*

It was estimated that 5000 bales of aghani was cultured in one year alone. However, subsequently, J. Ovington in 1689, gives us a long and detailed account of sericulture as practiced in Bengal. He does not specifically mention Bengal, but the terms used by him make it quite certain that he is referring to that province. He gives minute details of the November ‘bund’ indigenously called ‘aggoued’ ‘bund’. This ‘bund’ reputedly produced the best silk of all. Presumably the eggs were locally produced. In the November ‘bund’, silk-worms remained in the eggs for twelve successive days. This period could be termed as one of hatching. Ovington does not refer to any artificial aid to hatching. After twelve days from the first of November, worms were hatched or came out of

94. Ibid.

95. Ibid.


97. This is after the Indian month agrahayana which corresponds to November-December. Cf. A.L. Basham, p.492, wherein he gives the details of the Indian Calendar.

98. A.Yusufi Ali, A Monograph on Silk Fabrics, Allahabad, 1900, p.19, says that artificial heat was also given sometime to assist in hatching. A woman was employed to warm the eggs by the heat of her person under the armpits or angia (bodice). This primitive technique is said to have been followed univerally in the East. It was known in Kashmir and is referred to in ‘Ajaib-ul Makhluaqat, according to Yusuf Ali.
their eggs and were laid upon the mats.

For the first four days after hatching the caterpillars kept eating mulberry leaves (cut into small thin pieces) four times a day, viz., morning, noon and at 3 and 9 o’clock. On the fifth day they were not fed at all.

On the sixth day the worms were bigger and were fed with big pieces of leaves, four times a day, i.e. morning, noon, 3 and 9’ o’clock. They were thus fed for the next three days. On the 10th day feeding ceased.

They were given bigger or even full leaves from the 11th day and on 12th day, four times a day as formerly. They were not fed on the 13th and 14th days. From 15th to 18th, they were fed whole leaves, four times a day. On the 19th day, they were fed five times a day viz., morning, noon at 3 and 9 O’clock and at mid-night. They were fed in this fashion to the 26th day.

From about the 14th day, the worms used to get a green hue and on the 26th day they would be about 2½ inches long. On the 27th day, they became white and yellow. At this stage feeding was abandoned for the worms now began spinning.

On the 28th day, the worms were put upon ledges of mat fastened to a large piece of round matting. The ledges used to be about an inch high from the mat. The pattern of putting them on the mat was very curious. The silk-rearers began by putting the worms at the centre of the mat in a circular fashion. The distance could be a handful or three inches to the circumference. Once the worms were put upon those ledges, the
mat was put under the sun twice a day, once in the morning for one and a half hour and secondly in the late hours of afternoon from 4 o’clock till sunset. Then they put them in the house or in a shade, leaning against the wall. During this period, the worms started making cocoons.

On the 29th day, the worms with their cocoons were placed on flat mats, devoid of ledges or partitions. Mats were piled upon frames.

From the 30th to 33rd day, the worms went on spinning within their cocoons. On the 33rd day, the silk-rearers would shake each cocoon to distinguish the worms alive from those which were dead, did not make any noise, and were separated. The fluctuation in temperature brought variance in the ratio. The scorching heat and bitter cold used to take a heavy toll. Accordingly, the ratio of those alive could be only 1/8, ¼, 1/16.

The live worms continued spinning for the next four days (i.e. 34th, 35th, 36th and 37th).

On the 38th day, the worms who had turned into moths would eat through their cocoons. After this the rearers collected the cocoons and put the silk moths upon new mats. At this stage, the selection was made for seed. Males were distinguished by their slenderness in comparison to females. They were placed near each other for mating. This continued for a day. In case of a numerical superiority of either males over females or vice-versa, an equal number was first put near each other for reproduction; then they were joined with the rest and were left for the
whole night.

On the 38th day, the males were thrown away. Two days later the females laid their eggs and they were also thrown away likewise. Thus the whole life span of a worm lasted for fifty two days i.e. twelve days in the eggs and forty days out of it.

Next to the November ‘bund’ was the ‘maug’ ‘bund’ (magha ‘bund’). It began in January. In this, the life span of worm was fifty four days, fourteen days in the egg, and forty days afterwards prior to their death. It was the poorest of the silk from the ‘bunds’. The matings of worms used to end by the 14th of February.

The next ‘bund’ was made from the 14th February to the 24th of March and was called ‘cheita’ ‘bund’ (caitra ‘bund’). Of the forty days of the worms lifespan, the first eight days were spent in the egg. Silk spun in this ‘bund’ was considered next to November ‘bund’ in quality.

The next was the ‘sauk’ ‘bund’ (vaisakha ‘bund’). In this also, the period was again of 40 days (8 days in eggs). The silk was made by the first week of June.

The ‘sowaud’ ‘bund’ (sravana ‘bund’) was esteemed as the third best. It was completed by the end of July.

99. January-February

100. March-April.

101. April-May.

102. July-August.
No silk was made in August and September and very little was made in October.

The seasons of production and the nutritious nature of the mulberry on which the worms fed, were the determining factors of estimation and value of the produce.

Of the Saturniidae or partially wild silk producing insects, the tasar, eri and muga, were the most important. Tasar was commercially the most valuable of the Saturniidae. Its entomological names varied and equally numerous have been the vernacular names given to it in different parts of the country.\textsuperscript{103}

The antiquity of tasar silk is established by the statements ascribed by Strabo to Nearchus, Alexander’s admiral, who left an account of his experiences in India. Nearchus reports, “The serica also are of this kind. Byssus being dried out of certain barks”\textsuperscript{104} This is probably out of confusion between the cocoon and the bark of tree to which it was attached. Such confusion as we shall see, persisted in later times as well.

\textsuperscript{103} \textit{D.E.P.I.}, VI(3), pp.96-97.

\textsuperscript{104} “Geography of Strabo” in \textit{The Classical Accounts of India}, R.C. Majumdar, Calcutta, 1960, p.253. R.C. Majumdar says that by the word byssus, probably silk is meant (p.287). \textit{The Oxford English Dictionary} defines byssus (s.v.) as “an exceedingly fine and valuable textile fibre and fabric known to the ancients apparently the word was used, or mis-used of various substances linen, cotton and silk, but it denoted properly (as shown by recent microscopic examination of mummy cloths which according to Herodotus were made of \textit{Byooos}), a kind of flax and hence is appropriately translated in the English Bible ‘fine linen’.”
We do not find any direct reference to the word Tasar in Ancient India. Yuan Chwang (629-645 A.D.) specifically refers to *kauseya* as “silk from wild silk-worms”.\(^{105}\) He is obviously referring to Tasar silk. By the time of Abul Fazl, the word tasar had received a wider currency and he uses the word in the elaborate list of clothes in the imperial wardrobe.\(^{106}\)

Europeans who visited India in the 16\(^{th}\) century referred to tasar as ‘Herba or Yerva’ owing to the way it seemed to grow out of trees. It was believed that silk was prepared from the bark of a tree, since the cocoons were very neatly constructed, fixed with a pedicel and suspended from the branches of the trees on which the worms fed in such a manner that it appeared as if the cocoons were the fruits of the tree. The notice of tasar occurs as early as 1567 when Caesar Frederick says, “*Cloth of herbes*” (panni d’erba which is a kinde of silk, which growth among the woodes without any labour of man).\(^{107}\) Ralph Fitch (1585) especially uses the word ‘Yerva’ wherein he says, “......a great store of cloth which is made of grasse, which they call yerva, it is like a silk”.\(^{108}\) Similar observation was made by Pyrard de Laval in 1610.\(^{109}\)


\(^{109}\) Quoted in *Hobson-Jobson*, s.v. *grass-cloth*. Pyrard de Laval says, “Likewise is there plenty of silk, as well that of the silk-worm as
Laval points out that this silk was of the brightest yellow colour. It agrees with the peculiar bright yellow colour of tasar silk. The identification of 'herba' with tasar occurs as early as 1619.110 Streynsham Master confirms the identification of tasar with 'herba'.111 This refutes the speculations about 'grass-cloth' by Yule and Burnell.112 G. Watt identifies, abandoning his earlier identification of 'herba' with 'rhea' fibre, later thought 'herba' was eri silk on the basis of Streynsham Master's reference to 'arundee' or 'eri' silk,113 but here he obviously using 'herba' in the sense of silks other than mulberry. Master says that this was the first time he saw such silk, whereas he was already familiar with tasar known as 'herba'.114 However, Rumphius was the first European

Contd. . . .

of the (silk) herb, which is of the brightest yellow colour, and brighter than silk itself". (Hak. Soc. I, p.328).

110. E.F.I. 1618-1621, p.112, "There is also a kind of Bengala stuff of silke (or) grasse called tessar.....", Foster, ibid, suggests that a confusion was here between silk and the grass-cloth (herba) of Bengal.

111. Diaries of Streynsham Master, II, pp.81, 84.

112. Hobson-Jobson, s.v. grass-cloth.

113. Diaries of Streynsham Master, II, pp.299-300. Master says, ".....And observing the beggs in which the Merchants brought their silke to be a different sort of cloth from any he had seene, he was informed that it was called Arundee (arindi), made neither of cotton nor silke, but a kind of Herba spun by a worme that feeds upon the leaves of a stalke or tree caled Arundee.....". See also D.E.P.I, VI (3), p.99.

114. Ibid.
to recognise the tasar worm feeding on the leaves of Sonneratia acida – a small tree which inhabited the swamps on the coast of Bengal. He describes the tasar worm and the reeling of its silk in considerable detail.\textsuperscript{115}

\textemdash\ It seems that Indian reellers used the same technique of reeling for both the Bombyx and Saturniidae groups of silk.\textsuperscript{116} They had not become familiar with Chinese tools of reeling.\textsuperscript{117} Silk reeling means taking up the ends of several fibres and combining them into thread. Each of the fibres has twin filaments, known as brins, which is gummed together by sericin. Both together make the cocoon. It is spun in a figure-eight form by the caterpillar before its transformation into a chrysalis. Silk reeling starts just before the moth tries to break through the cocoon. This timing is very crucial for obtaining long silk threads. The length of the cocoon-filaments varied. But it is necessary to have a silkwinding instrument, a reel, and a water basin to float the cocoons. Despite the early evidence of silk in India, the beginnings of Indian silk reeling techniques are


\textsuperscript{117} Ibid., p.146 quotes Rumphius's (1619) observation that the natives of India had understood the method of reeling \textit{tasar} silk sometime during the late 15th century. It appears to be a casual remark in the light of the fact that India was familiar with wild silks from ancient times as seen earlier in this paper. Harprasad Ray, p.92; Dieter Kuhn, 5(9), p.347.
obscure. Since there was no alternative to reeling if a continuous filament was needed, it is clear that there ought to be a reel. The earliest evidence of silk reeling in China comes from the Shang and Chou period, 8th century B.C.\textsuperscript{118} Subsequently Chinese silk-reeling had a continuous upward movement in terms of innovations and their applications.\textsuperscript{119} One may suppose that once the spinning wheel had arrived in India by the 14th century, wheel-reeling could also have been diffused in Bengal. The preparation of this silk yarn began with winding of silk from cocoons. Silk winding was done on wheel.\textsuperscript{120} The \textit{charkh} (spinning wheel) was also used for twisting silk, silk being twisted (on it) for making it fine (\textit{barik}).\textsuperscript{121} However, India never received the Chinese silk-reeling wheel with crank and treadle, illustrated in China from 11\textsuperscript{th} century onwards.\textsuperscript{122} Besides the wheel, the silk was also twisted on hand spindles.\textsuperscript{123} But the earliest evidence of native mode of reeling comes from a Dutch report of 1687.\textsuperscript{124} It says that the cocoons were first put in hot water. This facilitated

\textsuperscript{118} Dieter Kuhn, pp.354-404.

\textsuperscript{119} Ibid.

\textsuperscript{120} \textit{Bahar-i-Ajam}, s.v. \textit{charkh abrishamtab}

\textsuperscript{121} Ibid., s.v. \textit{charkh tab}.

\textsuperscript{122} Needham, IV (2), p.107, Pl. CLIV.

\textsuperscript{123} \textit{Bahar-i-Ajam}, s.v. \textit{duk}.

\textsuperscript{124} Van Dam, II(2), pp. 68-69.
the melting of the gummy staff. It thus became pliable and the sticks of the unreeled cocoons were picked up according to the demand for raw silk yarn, (i.e. according to thickness of the required thread). The number varied from 10, 12, 15, 20 to 25 according to the required quality of yarn and fineness of unreeled cocoons. Their ends were tied to one reel. The report says that there should be something between the reel and cocoons in the hot water to prevent them from any entanglement. Water was tempered in such a manner due to the distance and the air around, that the silk coagulated in such a manner that it run to one particular thread. It says that a certain amount of viscosity should be retained so that when they were collected on the reel, they did not bind or (break) upon each other.

Unlike *tasar* silk, the thread is only softened during the process of reeling.\textsuperscript{125} In this regard the Indian system was considered better than the Chinese and Persian methods.\textsuperscript{126}

This process facilitated the separate strands cohering in the reeled thread or “single”. Thus a fixed and definite number of fibres were wound together into the single (i.e. the fibres from a required number of cocoons being wound together and slightly twisted into a thread known as “single”).\textsuperscript{127} It was found that some silks used to adhere very firmly

\textsuperscript{125} Ibid.

\textsuperscript{126} Ibid.

\textsuperscript{127} Ibid.
with each other. The Report points out that this was owing to the excessive heating of the water and insufficient regulating of the air. According to this report the quality of the silk depended on the uniformity in the general conditions of the air. If the air with which it came into contact did not vary then the chances of yielding of similar threads were greater. Thus the similarity of nature of thread/yarn was heavily dependent upon general weather conditions. Secondly, it reports that the cocoons were first boiled in water and then gathered and put into fresh water. The silk obtained from fresh water would retain its lustre and natural sheen. They were stirred by hand which led to dimming of the sheen. This dimness was caused by the large number of threads ranging from 12, 15, 20 to 25 which passed through the water. This made the water thick and rendered the silk dimmer. If it was boiled further then the chances of loss of weight increased more than the gloss. Therefore prolonged boiling was to be avoided. Silk thus obtained was categorised according to their quality and length. Filaments drawn from the better-grade cocoons were known as pattani and the lesser quality was termed as poot or potti.\textsuperscript{128} The raw silk reeled from the pattani filaments were of two distinct varieties: tannabanna and tanny.\textsuperscript{129} Under these two broad categories three sub-

\begin{footnotesize}
\begin{itemize}
\item[128.] Ibid.
\item[129.] Om Prakash, \textit{The Dutch East India Company and the Economy of Bengal 1630-1720}, p.55, found that the ‘tanny’ was a considerably superior variety that used a larger number of cocoons per unit of output. He claims that this variety was introduced only
\end{itemize}
\end{footnotesize}
categories. The *cabessa* (Portuguese usage for head) indicated the best quality; then came *bariga* and, finally *peeu* (Portuguese ‘foot’). Thus this classification was akin to head, belly and foot of contemporary English references. The last sub-category was also known as *gert-kerckerie* or *poot /potti* (the raw silk originating from the cocoon). It was subdivided into two categories: the best was the *pattani* and lesser quality, the *poot* or *potti*. The last came from the worst cocoons and both ends of the coarse silk was tied with either rearheads or heads. The *tanny* had seven subgroups namely (1) *fayn* (name for certain quality Bengal silk); (2) *Kora* (fine quality silk); (3) *dom* (silk of fine quality, woven *pattani* silk); (4) *zeem* (certain quality Bengal silk; (5) *pangium* (or *pangia*, silk of the best quality, produced in Bengal), (6) *szesum* and (7) *ketsier* (one of the worst quality) and so forth.\(^{130}\) This report is also very helpful in determining the quality of silk on the basis of their cost of production. While 1 *ser* of *pattany* was equal to 1 *ser* of *tanny*, i.e. Rs. 3.4½ the tanny for *tannabana* was priced at the rate of Rs.2.6½ and 1 *ser* of *poot* or potty at Rs.2.4.

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\(^{130}\) Van Dam, II (2), p. 68.
Table I
Cost of Production of Seer of Tannabanna, Tanny Raw silk and Poot silk.

<table>
<thead>
<tr>
<th>Item of Cost</th>
<th>Tanna banna (in rupees)</th>
<th>Tanny (in rupees)</th>
<th>Poot (in rupees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cocoons at 6% seers per rupee</td>
<td>1.88</td>
<td>2.37</td>
<td>1.62</td>
</tr>
<tr>
<td>wages of the drawers of the pattani filaments.</td>
<td>00.30</td>
<td>00.50</td>
<td>00.60</td>
</tr>
<tr>
<td>Food provided to the pattani drawers.</td>
<td>00.08</td>
<td>00.13</td>
<td>00.10</td>
</tr>
<tr>
<td>Wood used as fuel</td>
<td>00.13</td>
<td>00.20</td>
<td>00.10</td>
</tr>
<tr>
<td>Wages of the reelers</td>
<td>00.30</td>
<td>00.60</td>
<td>00.40</td>
</tr>
<tr>
<td>Total cost</td>
<td>2.69</td>
<td>3.80</td>
<td>2.82</td>
</tr>
</tbody>
</table>

Source: Pieter van Dam, II (2), pp.69-70.

From the above analysis, we find that real wage bill works out at 32.36 per cent in the case of tanny silk, 25.27 per cent in the case of tanna banna silk, and 39% in the case of Poot silk.\(^{131}\)

The above table also gives us an indication as to why a particular kind of silk was preferred. Poot silk procurement was discouraged admittedly on ground of its inferior quality.\(^{132}\) Along with inferior quality of the filament drawn from poot cocoon, the cost of production was also very high.\(^{133}\) Therefore it is not very surprising the Dutch company’s preference was or pattani filaments alone.\(^{134}\)

\(^{131}\) Ibid.

\(^{132}\) Ibid., pp. 69-70.

\(^{133}\) Our reading of the information provided by Pieter van Dam is quite different from that of Om Prakash, see Om Prakash, op.cit., p.55-56.

\(^{134}\) Om Prakash, p.56.
Besides these three categoris and their sub-categories, there was another kind of silk called *mochta* silk,\(^{135}\) which was florette yarn of the Compay records.\(^{136}\)

By the seventeenth century silk had become one of the major export commodities of Bengal. Tavernier says that Qasimbazar in Bengal alone was annually providing 22,000 bales of 100 *livres* which would mean a production of 3.1 or 2.4 million *livres*.\(^{137}\) Tavernier further says that the Dutch procured around 6000-7000 bales annually i.e. 6-7 million *livres*.\(^{138}\) This estimate\(^{139}\) only of the produce possibly of the chief market, compares well with total Indian silk production of 3 million lbs in of 1917.\(^{140}\)

\(^{135}\) This is identified as *matka* silk because of the nature of origin of this silk. It was produced from the cocoons from which the moth had flown by piercing them. *Machta* is, therefore, from the word ‘released themselves’, *muchkata*. See J.C. Ray, "Textile industry in Ancient India", p.219.

\(^{136}\) Om Prakash, p.56.

\(^{137}\) Tavernier, II, p.2.

\(^{138}\) Irfan Habib, *Agrarian System of Mughal India*, p.52.

\(^{139}\) Om Prakash, *The Dutch East India Company and the Economy of Bengal, 1630-1720*, p. 57 doubts the veracity of this statement of Tavernier.

\(^{140}\) Irfan Habib, *Agrarian System of Mughal India*, p.52.
3. WOOL

Wool held a very subordinate position among the fibre of medieval India. This was due partly, of course, to climate. Cotton-quilts often served as warm clothing in India’s relatively mild winters. R. Fitch observed that in winter, instead of wool, “the men weare quilted gownes of cotton like to our mattraces and quilted caps....”1 Secondly, the relative dearness of woollen cloth and cheapness of cotton also restricted the spread of its use. J. Salbank wrote from Agra, “...indeed wollen cloth is so rare a matter to be seen\worn by the people of this country, by reason of the dearness of it and the cheapness of their own cotton clothes, that I do not remember I have seen as much as one woollen garment of our English cloth worn by an person in all this country.”2 Moreover, the sheep of the Indian plains produced wool that was comparatively of inferior quality. The European travellers remarked that it was coarse and considered it suitable only for blankets.3

Nevertheless, woollen clothes were manufactured in India, particularly in Kashmir and Shrinagar,4 Alwar and Merta in Rajasthan,5

1. Ralph Fitch, Early Travels, p.32.


3. Terry, Early Travels, p.297; Letters Received, VI, p.200.


Punjab, Agra and Fatehpur Sikri in Uttar Pradesh, in Ellur in Coastal Andhra.

Wool was collected in Kashmir. Kashmir also received fine wool from both greater Tibet and Lesser Tibet. Wool was also collected in the northern mountains of Uttar Pradesh. Sheep were raised in Kabul. Sheep were also raised in Sind. Assam also produced wool of a kind known as ‘bhut’ or ‘phut’.

Apart from wool proper, very high priced cloth was woven in Kashmir from goat’s hair called ‘tus’. These goats (tus) were domesticated


7. *Ain-i-Akbari*, I, p.50; Pelsaert, p.9; Thevenot, p.56.


and raised in Greater Tibet\textsuperscript{15} and Rudok.\textsuperscript{16}

Unfortunately, our medieval sources lack in furnishing the relevant details with regard to wool preparation. Perhaps, the Indians did not know the use of iron-shears for shearing sheep till as late as first half of 19\textsuperscript{th} century. As late as early 19\textsuperscript{th} century. Moorcroft and Trebeck tell us that knife and comb were used for this purpose.\textsuperscript{17} The iron shears were in use in Europe as early as 250 B.C.\textsuperscript{18}

In cleaning and separating the wool certain particular methods were observed. In Kashmir, husked rice was steeped in clean cold water, for four hours or longer to soften it. Afterwards it was powdered upon a stone slab. The picked wool and powdered husked rice were laid alternately in layers, and squeezed with the hand until they were completely intermixed. A little water was occasionally sprinkled over the heap in the hot and dry weather. Soap was not used because it made the wool harsh. In this manner, the powder was treated for an hour, and then it was removed. The wool was opened and nails were used to separate

\textsuperscript{15} Tuzuk-i-Jahangiri, p.301; Bernier, p.403; Cf. W. Moorcroft and G. Trebeck, \textit{Travels in the Himalayan Provinces of Hindustan and the Punjab, in Ladakh and Kashmir, in Peshawar, Kabul, Kunduz and Bokhara ...from 1819 to 1825}, I, New Delhi, 1971.


\textsuperscript{17} Moorcroft and Trebeck, I, pp. 410-11.

\textsuperscript{18} Forbes, IV. p.8.
wool. The wool was made into nearly square, thin elastic pads, called ‘tumbu’\textsuperscript{19}.

Thus, the wool was ready for spinning. For spinning, it seems spinning-wheel was adopted\textsuperscript{20} But, the finer yarn was spun on spindle\textsuperscript{21}.

Apart from woollen clothes woven on loom, felts were also made in India.

Felt is formed under pressure combined with moisture, and, preferably, heat. Crimp and scaliness are the two properties which facilitate felt formation. The fibres of wool interlace when it crimps in moist heat, the scales prevent the fibres from sliding back. An irregular fabric is produced by this interlacing process. Stronger fabric can be produced if the so-called fulling-agents (such as alkaline or fuller’s earth) are applied to intensify the natural properties of wool.

In Iran, felt-making is one of the traditional crafts and the technique has been described by Wulff\textsuperscript{22}. In preparing felts in Iran, first of all, large wool bats were placed on the ground, and were sprinkled with soap water. Then the fullers walked over them to obtain the first interlocking. The wool was worked on with bare feet. The mildly

\textsuperscript{19} Moorcroft and Trebeck, II, pp.168-9.

\textsuperscript{20} Bahar-i-Ajam, s.v. duk

\textsuperscript{21} Cf. Moorcroft and Trebeck, II, pp.170-1.

\textsuperscript{22} Hans. E. Wulff, pp.222-224.
compacted bat was rolled up in a canvas or reed-mat and was placed on an earthenware mould heated from underneath. This roll was again worked by several men before the felt was sufficiently dense.

Felt making in India may go back to the times before Christ. Writing in 1st century A.D., Strabo ascribed a statement to Nearchus, Alexander’s admiral (late 4th century B.C.). Nearchus reported, “that when they (the Indians) saw sponges in use among the Macedonians, they made imitations by sewing the tufts of wool through and through with hairs and light cords and threads, and that after compressing them into felts they drew out the inserts and dyed the sponge like felt with colours........”23 As late as Jahangir’s reign, we find reference to felts being made in the manner Nearchus had spoken of. Jahangir says that in Kashmir two shawls of wool were stitched together and pressed hard like suqarlat (felt).24 In the plains felt (suqarlat) was manufactured in Nagor.25 The felted wool was also called namad or namda.26 The Bahar-i Ajam defines a felt-maker (namad mal) as “the person who rubs and directs (mubasharat kunad) and this act is called felting (namad


26. Bahar-i-Ajam, s.v. namad.
malidan)." It quotes a verse of Saifi: "If in the night of union (shab-i-wasl), the felt-maker (namad-mal) gives me moon like hand, I will rub face on face as the felt-maker rubs the felt with his feet". The same dictionary notes that 'weaving felt' is wrong usage since there is no weaving involved in felt making. It also refers to the fuller’s earth (sang-i-qibti), but it does not connect it with the technique of felting.

27. Ibid., s.v. namad mal

28. Ibid.

29. Ibid., s.v. namad baftan.

30. Ibid., s.v. sang-i-qibti.
4. HEMP

San or Sunn-hemp was one of the bast-fibre yielding crops in the sixteenth and seventeenth centuries.¹ Irfan Habib has pointed out that the dasturs in the A'in assume its cultivation in almost every part of the zabti provinces (Lahore, Delhi, Agra, Ajmer, Awadh and Allahabad).²

In the suba of Multan it was grown in sarkars of Multan, Dipalpur and Sadkharah.³ It was presumably not cultivated in Malwa for it does not figure on the list of crops of the autumn harvest.⁴ So far Bengal is concerned, it was produced mainly for local market.⁵

In the peninsula Tavernier reports its cultivation at Vengurla on the western coast.⁶ He speaks about 'toti' which actually refers to hemp and not jute.⁷ Fryer reports its cultivation at Karwar and Mirjan.⁸

Havart reports about cultivation of hemp and manufacture of yarn


³. Ibid., p.385.

⁴. Ibid.

⁵. Irfan Habib, Agrarian System of Mughal India 1556-1707, p.46. Read especially his observations in the footnote number 62.

⁶. Tavernier, II, pp.148-149

⁷. Irfan Habib, An Atlas of the Mughal Empire, p.67, Sheet 16B.

from hemp and sailcloth made of hemp yarn in Coromandel. He tells us that it was generally sown in the month of February.  

The plant used to come up in five or six days and was ready in three months for harvesting. Once the plants were cut, they were tied into small bundles and were put in the water for five or six days in order to rot. Then the stalks, now quite rotten, were taken out and laid to dry for eight or ten days. Thereafter they were peeled off with sticks. Once they were peeled off they were tied into bundles again and purchased by merchants. They were transported on oxen according to demand. The hemp was obtained mostly in the provinces of Eloer [Ellore] and 'Ragie mandry' (Rajah mundry). The hemp was brought to Palicol (Palakkollu)


10. Ibid.


12. Ibid.

13. Ibid.

14. Ibid.

15. Ibid.

16. Ibid.

17. Ibid.
from a radius of five ‘native’ (jentieffsche) or twenty-five Dutch miles. 

Each ox used to carry 240 pounds of hemp. This hemp was then brought to Palicol, the fibre were first knocked soft with woods (houten) to be rendered pure so that they generally lost one pound out of three. 

Supplied to the Dutch Company their ‘ropemaker’ used to make fine sailcloth (zeyl-lijk) and cable yarn. They used to cost twenty-one guilders for four hundred eighty pounds. The cost of the yarn made of hemp differed between the places of cultivation and manufacture. Fine-sail cloth yarn cost eighty six guilders for 48 lbs. The ordinary cords spun from a rough kind of hemp used to cost twenty five guilders.

When the hemp was completely ready, it was spun into thread on a spindle, by both men and women. It was woven into cloth by men in the open air with the help of very rude loom.

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20. Ibid.

21. Ibid.

22. Ibid.

23. Ibid.

24. Ibid.

25. Ibid.


27. Ibid.
SURFACE TREATMENT OF TEXTILES
5. DYES AND DYEING

Prior to the application of any dye to the woven cloth, it was washed and bleached.\(^1\) Tavernier (1667) emphasises the use of lemon in bleaching cotton.\(^2\) He says that the people of Kasimbazar used to bleach silken fabrics with a lye made of the ashes of the plantain.\(^3\) Roques in his account of the 17\(^{th}\) century cloth-printing in India refers to 'half bleaching'.\(^4\) The Beaulieu MS of 1734 tells us that rice water and lime were customarily used in bleaching ordinary cloth.\(^5\) This washing and bleaching of cloth prior to dyeing was resorted to in order to remove the extraordinary gumming, starch and 'beating' practised by the weavers to hide loose weaving.\(^6\) Warp threads corresponding to parity with the weft required to make the fabric even and smooth, so that it could properly receive the dye or pattern through printing blocks and prevent the surface bloom from crack.\(^7\) In the second place, washing and bleaching prior to colour

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2. Tavernier, II, p.5.

3. Ibid., II, p.3


7. Roques, p.4.
application, obviously 'cured' the cloth of impurities. It was largely done at Baroach, Baroda, Lakhawar, Saman, Navsari, Lucknow, Masulipatam and Kashmir. Unfortunately, we do not find any description of properties of water in these localities. Brackish water was always avoided to keep the lustre of the dyes.

Once the cloth was bleached and whitened, it was ready for dyeing. Various natural dyes were employed for imparting colour. Natural dyes were those of vegetable and animal origin. Of them, indigo enjoyed the primary position. In textile technology, it was an essential element in both bleaching and dyeing.

The historiography of indigo production technology during medieval time lags behind that of trade in it. Our understanding of the


12. Ibid., p.168.


17. Cf. W.H. Moreland, India at the death of Akbar, pp.102-5, 112,
development of medieval manufacturing technology is comparatively of recent origin. At the present state of our knowledge; we have begun to

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recognise the crucial importance of indigo production in the growth of the textile industry. Looking at the potential of indigo production during the 17th century— or perhaps till the invention of chemical dye in the mid-19th century— we can safely say that it induces a study, howsoever preliminary in its nature, of its technology involving “fresh material”, “reassessment” and “reinterpretation”.

Indigo (Indigofera tinctoria) is believed to be a native of India. It was used in Egypt as early as c. 2500 B.C., though on a small scale.\(^\text{19}\) From there it spread later to Syria and Palestine.\(^\text{20}\) In India, we find references to it as kala or asikni in the Atharvaveda which could be dated to B.C. 1000-600.\(^\text{21}\) Later references follow.\(^\text{22}\) The first, epigraphic reference could possibly be traced in an inscription of the 6th century A.D., where we find direct mention of the term nila.\(^\text{23}\) This particular inscription refers twice to nila in the context of categories of professions

20. Ibid.
excluded from forced labour, and also with reference to indigo dye (nila dumphaka) and indigo-vat (nila-kuti). The dumphaka had to pay the tax of three silver coins for a nila-kuti. Indigo had acquired a prominent position as a cash crop between A.D., 1000 to 1300.25

Jagadish Narayan Sarkar is to be credited with pioneering the study of the processes of manufacture of indigo. However, some of his suppositions may be disputed. There seems no basis for his assumption, for example that only one vat was used at Sarkhej in contrast to more than one at Bayana.26 The studies of Iqtidar Alam Khan and K.K. Trivedi where field-work has been correlated with contemporary textual evidences have been confined to the Bayana tract. There is much fuller information, however, on Sarkhej indigo owing to two Dutch accounts viz., those of Geleynessen de Jongh (1632-1640 in Gujarat)27 and

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24. Ibid., The term nila-dumphaka possibly applied to manufactured blue dye from the indigo plant and nila-kuti may mean an indigo factory. According to D.C. Sircar, the term dumphaka was perhaps derived from the Sanskrit drimphaka which meant “one who presses”. The use of this particular term is interesting because of the action involved in indigo manufacture.


Mattheus van Heck (1681-1700). Van Heck's is possibly the most detailed contemporary description of the implements and processes used in the manufacturing of indigo at Sarkhej.

The best indigo in India grew in the Bayana tract near Agra, and the next best in quality at Sarkhej near Ahmadabad. It was indigo raised in these two tracts that mainly entered India's oversea trade. The Bayana tract comprised villages around five chief places. Pelsaert provides us information about these villages and mentions their distance from the nearest of the four of the five chief places. Under Bayana, he lists twenty seven villages: Ebrahemedebat (1 kos), Serco (4 k), Otschien (Ujjain) (6 km.), Patehiouna [Pachauna?] (5 k.), T’sonoua [Sanowa] (4 K.), Pinijora [Piraru?] (6 k.) Maunana (6 k.), Birampoer (4 K.), Melecqpoer [Malikpur] (4 k), Berettha (Barata) (5 k.), Azenaulie (4 k); Batziora [Bachora] (4 k), Pedaurle (4 k), Gordaha (5 k), Helleck (7 k), Nade Beij (10 k),


29. Ibid.


Pehekertsie (7 k), Koreka (5 k), Khondier (5 k), RodauwIkera (Rudawal khera) (4k), Nimbera (Nibheira) (7 k), Berouwa (5 k), Ratsiona (7 k) Indiara (4 k), Tseneorpana (5 k), Lathehora (7 k). The second group (main seat: Khanua) comprised 13 villages: Khanua (approx. 50 km west South West of Agra),^32 Mahal (2 k), Roubas (Rupbas) (2k), Tsertsondad (Sirsanda) (1½ k), Daber (2 K), Mahalpoer (1k), Danagham (2 k), Bockolie (Bakhauli) (1 k), Barrawa (1 ½ k), Ordela, (3/4 k), Ziasewolie (Jajawali) (1½ k), Phetapoer (Fatehpur Sikri?) (5 k). The third group comprised 13 villages. Bhasawar (around 100 kms to the west of Hissounla (4 k), Tserres (2 k), Borolie (1 1/4k), Ziarathara (3 k), Pantla (2 ½ k), Chachauli (3 k), Tsonoher (6 k) and T'sonkeri (6k). The fourth had nine villages. Hindaun (around 100 kms to the west southwest of Agra),^33 Khera (2 k), Jamalpur (2 k), Kottopoer (2 k), Paricanepoer (3 k), Wazirpur (6 k), Surot (5 k), Sittoiali (6 k), Nardoulie (6 k). The fifth principal place was Todabhim (18 k from Bayana). It had also many villages under it but its indigo was not as violet in colour as elsewhere.^34

Thus 'wet leaf' process was generally practised in indigo manufacture in this area.^35 In the 'wet' or fresh leaf process, the plants

32. Pelsaert writes that it was 10 kos west of Bayana.

33. Pelsaert, p.260, indicates it to be 10 kos east of Bayana whereas it is to the north of Bayana.

34. Pelsaert puts it at 10 kos from Bayana, p.260.

were put into water tanks or vats immediately after being taken off the field. W. Finch (1608-1611) and Plesaert (1626) speak of two vats, one in which the stalks and leaves were ‘allowed to steep’, letting out the dye; and the other, at a lower level received the dye-laden water. The water was first stirred strongly by manual labour to absorb the dye particles, and then allowed it to lie still for 16 hours. The dye settled down at the bottom, from which it was collected after the tank was slowly emptied water through a low hole. This was the practice at Bayana.\textsuperscript{36} Mundy (1632) and Tavernier (1666) speak as if there was only one tank.\textsuperscript{37} in such cases the stalks and leaves must have been taken out after having been steeped in it. The vats were built of very good cementing lime.\textsuperscript{38} The walls of the vats were sufficiently hard to resist the most vehement beating.\textsuperscript{39} After beating, the extract was dried in the sun generally.

Boilers were not used by Indians in this process. But, boilers seem to have been employed as early as the early 16\textsuperscript{th} century in what has been designated the ‘dry leaf process’. Salbancke says that at Bayana indogo

\textsuperscript{36} W. Finch, \textit{Early Travels}, pp.152-153; Pelsaert, pp.10-11.

\textsuperscript{37} Mundy, II, pp.221-222; Tavernier, II, p.8.

\textsuperscript{38} Tavernier, II, p.8, says, ‘After the Indians have cut the plant they throw it into the tank made of lime, which become so hard that one would say that they were made of single piece of marble. Pelsaert, pp. 66-7 describes the use of plaster made of unslaked lime, milk, gum and sugar.

\textsuperscript{39} Tavernier, II, p.8.
plants "Being cut downe, it lyeth on heapes for half a yeare to rot, and then by oxen it is troden out from the stalkes, and afterward its ground very fine, and then boiled in fornaces, and so sorted out in severall sorts..." Salbancke's testimony remains unique, for according to modern descriptions of the indigenous practice, the dried leaves are simply put into the steeping and beating vats largely in the same manner as for the fresh leaf. But see below for the process of boiling attested from south India in late 17th century.

As for Gujarat, Jambusar was a well-known indigo producing site. It was a large village, situated on the road of Cambay, around 10 miles from Broach. It along with neighbouring villages supplied indigo as good as those of Sarkhej. However, Pieter van den Broecke (March 1622) noticed that "in the village Jamosar (Jambusar), ... the indigo de matto is made, called in Indusstan (Hindustan) Singilli, .... considered worst (slimsten) of the entire India." The term 'indigo de matto/matto' is also used by Pieter van den Broecke in describing the indigo made at

40. J. Salbancke, *Purchas His Pilgrimes*, III, p.84.

41. *D.E.P.I.*, IV, pp.434-5, In the European planters' factories, the indigo 'pulp' obtained from the boilers was again put into a boiler to prevent fermentation (ibid, p.436).

42. Van Dam, II (3), p.7.

43. Ibid.

Cihiri (mod. Shihir in Mukalla) near Aden. The term 'mato' is a Portuguese term for forest or jungle. Moreland has interpreted the term 'singilli' for 'jangli'. It seems that it was possibly not true cultivated and so indigo and so not of good quality. It was used for dyeing black and blue baftas. Nevertheless it was generally accepted to be an inferior variety. Indigo was also produced in Cambay, which was also an important port for its export. Ahmadabad held a high repute for cultivation and manufacture of indigo, with Sarkhej practically a suburb of it. Baroda was another indigo producing area.

Geleynssen de Jongh writes that there were twenty five principal villages or small towns (hoofdorpen ofte cleyne stedekens) in Ahmadabad which had 2,898 villages and small places under them. Under these twenty five principal villages was the famous locality of Sarkhej (1

45. Ibid., I, p.41.

46. Ibid., II p.380 Hence it will not be correct to assert that it was used only for dyeing black baftas, see, Ghulam Ahmad Nadri, “Indigo Industry and Trade in Gujarat in the Seventeenth Century”, p.7-8.


48. Ibid.

49. Van Dam, II (3), pp.7-8.


51. An Atlas of the Mughal Empire, p.26, sheet 7B.
½ miles north of Ahmadabad).\(^{52}\) What was produced in small villages situated around this village Sarkhej, indigo was made and sold at Sarkhej.\(^{53}\) Therefore, it appears that the Sarkhej tract was much smaller than the Bayana tract.\(^{54}\)

Indigo was planted in June in the black sandy soil which used to be sooty sand.\(^{55}\) Plant cutting was first done in the last week of October or first week of November.\(^{56}\) The first and second cuttings were called ballera and the third was known as baldewa.\(^{57}\) In the first half of the 17th century, Geleynssen de Jongh describes only the dry-leaf process. But by the end of the 17th century, the wet-leaf process had also come into vogue at Sarkhej. Mattheus van Heck refers to the application of both the processes,\(^{58}\) although the Dutch East Indian Company (V.O.C.) itself procured the indigo made from dry-leaf process.\(^{59}\) It seems perhaps

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53. Ibid.

54. See Irfan Habib, *An Atlas of the Mughal Empire*, for Bayana indigo tract, 6B, 27±, 77±, 8B 27± 77±; for Sarkhej tract, ibid. 7B, 22+, 72+, see also Notes on pp.20, 26.

55. *Remonstrantie van W. Geleynssen de Jongh*, p.46.

56. Ibid.

57. Van Dam, II(3), p.73.

58. Ibid., p.74.

59. Ibid.
that the wet-leaf process was not as good as that of Bayana. This assimilation of a new process indicates the range of diffusion. The question of adoption and adaptability of this relatively new technique in the perspective of Sarkhej is central to the problem of transmission of a manufacturing process. This was, induced, presumably owing to the expansion of demand for indigo by various sections of traders. The impact of such technological changes depended on the identification of social stratum which demanded its diffusion, and controlled its application and consumption.

Indigo from green leaves was termed in Gujarati (though it appears) "silapoankeniel". "Silapoanke" appears thus to indicate green leaves. This was confined to Sarkhej, because most or perhaps all the vats were located there. Its annual turnout was about 200 and 300 man (one man = 36½ Dutch pond). This was mostly used by the highly professional dyers and beaters (kloppers) of Ahmadabad. The overseas traders kept themselves away from it because of the comparatively high price which used to range from 25 to 40 rupees per man 34¼ to 34½ Dutch ponds. This abrupt rise in price possibly contributed to the sharp decline in the quantity of indigo, exported during the last decade of the 17th century. The long distance merchants usually preferred "soukapoankeniel" (dry

60. Ibid.

leaves), i.e., dry-leaf processed indigo. These two kinds of indigo had two distinct forms, the first being flat and the other round.\textsuperscript{62} The indigo makers used to meet the deficiency of local production by procuring leaves from surrounding areas after the monsoon was over. This was mostly done in November and December.\textsuperscript{63}

Hence Geleynssen de Jongh's account of indigo manufacture is of considerable interest: The leaves were dried in the field under the sun and, thereafter, these were struck off from the branches. These leaves were then put into a square tank or water vat which had a depth of one fathom (i.e. 6 feet) and therein it remained for 4 to 5 days. Then it was stirred (omgeroert) and messed about (gemorselt) with the help of a big staff. This water now obtained the blue colour, but the pigments gradually sank due to the rotting of leaves. Afterwards, it was transferred into three more vats a little of the thickness of the leaves remained. It was left idle for one or two days. Thereafter, the vat was stirred again and drawn off (getapt) in two more tanks where it was allowed to stay for the whole night. The indigo being heavy, used to settle down when the water was drawn off. The thick one that settled at the bottom, was passed through a strainer, dried in the sun and then cut into pieces.\textsuperscript{64}

\textsuperscript{62} Van Dam, II(3), p.74.

\textsuperscript{63} Ibid.

\textsuperscript{64} Remonstrantie van Geleynssen de Jongh, p.47.
So far the dry leaf process is concerned, our sources offer descriptions that we have already touched upon. Nevertheless, the account of Mattheus van Heck still holds good and stands head and shoulder above previous descriptions. The following discussion is mainly based on a summary translation of Van Heck's draft. First of all, none of our previous sources informs us about the implements employed in the preparation of indigo. Mattheus van Heck refers to numerous implements required in indigo production. His list shows as many as fourteen accessories needed in this craft:

1. **mandaan**, the gibbet (galg) at the depth of the well.
2. **koos**, a leather bag with an iron ring (*beuqel*).
3. **Wet**, the leather rope/string (*touw*).
4. **tabarrad**, two oxen.
5. **thaloe**, a small water trencher (water bortje) on the well.
6. **kodaly**, spade (*aertijser*).
7. **dentaly**, wooden rake (houte herk), 3 to 4 pieces.
8. **matthan**, churning plungers/churning staff (*karnpols*) 8 to 10 pieces.
9. **matthan** or **karwala**, pots, which were short or rather narrow at the necks (hals), but thick in the belly and were circular inside.
10. **oundhani** or **cransje**, where the pots were set up, they were plaited off with Osier (twig) (teen) or straw.

65. See above foot note 2.
11. *datri*, earthen dishes at the columns of water.

12. the *sipi* or shell, to scrape through (bijeeneschrapen) indigo pulp placed on the cloth, where the indigo was stored up.

13. *longo*, a piece of cloth, that was held before the hole of *ner* (male vat).

14. *loy*, a piece of thick cloth, with which the indigo was driven out of *mada* (female vat) into the *sjaernia*.

The 'kocx' or well were of various sizes and depths. They could be deep or shallow (ondiep) according to the situation of the place. The water was reasonably sweet, so much so that it could be used in caboose. The water was lifted by one or two oxen in a leather bag (koos) and stored in square tank (*sjabatsia*) placed on the one side of the well. The water flowed from the *sjabatsia* into the drain (goot). They were masonry drains. The furrow/groove (groef) led the water from the well or or *sjabatsia* to the drain.\(^6\) This proximity to source of water was indispensable in manufacturing indigo. Then, there were two tanks (not deep) which used to be circular or square, to store the required water. One was called *ner* (male) being a round and flat tank. With a diameter of 6-3/10 el (15-2/11 feet). Its had a depth of 1-5/32 el or (2-26/33 feet) up and down. It had a flat and smooth base except near the drain. A hole was made between the brim and the bottom. It was called *mori* where a

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\(^6\) It was also called *near* (*nehar*) or *nolars* (*nalas*)? Cf. Van Dam, II(3), p.74.
little hole was made at the base. It was done to free the water from heavy and sandy substances. The water was retained here to allow the sediment to deposit prior to its use, presumably to prevent the muddy water from impregnating the dye with a quantity of dirt which could have affected the quality of the dye. Secondly, the stagnant and foul water could impart to the sediment a harmful property which could retard the process of settling and drying. In the course of its flow, the liquid could sink and make a resting place. This ner was the steeping vat wherein the dry leaves were first softened (geweeckt) and moistened (bevogtigt werden). The size of the reservoir (‘backge’) as well as the number of vats depended on the amount of plant which was expected to be treated. There used to be another vat which was called mada (female). A cavity was made in the bottom of ner which had its exit in the mada. The mada was a vat of larger depth. Since the brim rose (stijght) half a foot above the cavity and bottom of the ner, the body of the vat was taken under the ground. This was done to obtain the supply of water from the ner. They might differ sometimes in their measurements. Van Heck had measured some and found that the mada (or the beating vats) and ner were normally of

68. Ibid.
69. Mattheus van Heck informs that taxes were settled at this stage. See Van Dam, II(3), p.76.
70. Van Dam, II(3), p.76.
the same size. Measured by Van Heck these were found to be about 6-3/10 or 15-2/11 feet in diametre or they were 19-4/5 ell or 47-55/77 feet in circumference and 1-5/32 ell or 2-26/33 feet deep, at the top and bottom. The bottom of the *mada* was not flat but descended in oblique direction towards the middle and ended in a still deeper vat called *condi*, the mixing vat. It had a width of 7/8 ell (2-1/44 feet). It was spherical (kogelront) from the ground in the centre and had a depth of around 1 ell (2-9/32 foot), being on one side of the bottom provided with a water discharging hole. To this vat (*mada*) was attached another known as 'sjaernia'. This was a vat of unspecified size. Those which our author saw at Sarkhej had the inner wall of almost the size of 7 or 8 el in circumference, or little less or little more than 2½ el wide, the depth like that of the *mada*.\(^71\)

This vat was without a hole and it was open only at the top. A sloping (afhelling) small flight of steps (stoepje) of stones was raised against it in order to pour out (uitgieting) the surplus surface fluid. It was the collecting vat (vergader back), usually in a square shape. The attachment (tsaamgeheght) of the frame of the vats or tubs (kruijpen) was set with walkable (bewandebare) broad brim and thick walls. It was observed that one or the other side of the *condis* or vats for mixing were a little separated and were put firmly in square form.\(^72\) As many as 6 to 8 vats and few small ones were arranged in the manner shown in the

\(^{71}\) Ibid.

\(^{72}\) Ibid.
diagram (Fig.1). The big vats were called *condijs* and the small ones, (kleyne kollighden) (empty space) and *pandoa*, i.e., foot washers. The big ones were 1½ ell (3-27/44 feet) and the small around 3/8 ell (154/176 foot) wide and deep.

The *ner* was filled with water upto the height of a palm through the channel (*de neher*). It remained there for the whole day. It was believed that the morning breeze would make the substance poorer. The dry leaves of the weight of 40 mans (1380 Dutch ponds) were put into the *ner*, but 1/4th of it, that is, 10 *mans* or 345 Dutch ponds would consist of filth. Upon soaking, it became a little soft. Water was put into it from the second water tank with the help of earthen dishes (*datri*) and the leaves were usually brought to the collar of the vat. These leaves in the *ner* threw up foam (schuym). After this, the same was drained out into the *mada* (the beating vat) which acquired darker green colour then that of poorer leaves. Here it was stamped upon heavily (geklets) else the finest and the best-gloss would perish. The liquid would now take a dark-green or dark colour. This process induced chemical reaction by the contact of fermented liquid with oxygen in the air. We do not hear of the use of

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73. Ibid. p.77.

74. Ibid., p.78.

lime water which facilitates precipitation. Perhaps this method was a late addition. 

Violent beating had its own hazards. It could break up the grain of the emerging dye. The wet sediment was then laid to rest from midday to the next morning. Already the turbid and stodgy (swaar) elements sank downwards in the direction of condi. The liquid would show a poorer and lighter green colour. The one which had settled down would be of a browner hue and was passed freely through the mori. However, because the bottom sloped down and a hole could not possibly be made lower than the brim, there would still remain a good quantity of disposable (weghwerpelyk) liquid which was thrown out with the help of pots (karwalas). This was dumped outside the vat and the bottom became visible.

It seems that a little turbid sediment, which was allowed to sink in the condi, was dumped at the side of the vat. At the same time, one or other, the condi. or middle vat was filled again, but that was so designed, that the condi, discharged hardly any thing other than water. A full thick piece of cotton cloth (loy) around 6 ells long and 1½ ell broad located with both the ends tied (vast knopen), received the dark and turbid liquid from the condi of the mada, was scooped out with the help of baskets (opgemant), as two labourers held the cloth so wide as was possible, and

76. Ibid. Watt reports about such a practise in the 19th Century.

carried on shaking the substance passed into the collecting vat (sjaernia) through the loy, the cloth also holding back such leaves, sand and other stuffs which had slipped from the ner into the mada, while the good substance of the indigo sank at the condi and from it as well it was ladled out. Then the labourers would go down and clear away the underlying leaves for soaking it again. This gentle (saghte) action of pressing down and drawing up continued for 3 to 4 hours and “goodness” (kracht, lit. strength) of the leaves moved up. Now the two labourers, provided with a reasonably thick cloth called longo, opened the mori (exit) of the ner. The green (ooggroen?) liquid took its course through the mori while the longo was held by two labourers, who propped up the flowing leaves in the mada. In between, one person stirred round and round the leaves with a wooden rake which had 5 to 6 teeth. It was called dantaly. This stirring was such that it made a cross channel (?) (kruys kanals) by the accumulation in four portions in the ner. This facilitated the flow of water adroitly towards the mori, from where it was finally drawn off (afgetapt sijnde). The used leaves were dried and sold off for a meagre price by the foremen (meester knecht) and other labourers to the farmers who used it as fertilizer or for “freshing up their land (koeling van het lant)”.78

The green liquid, thus prepared in the ner, was poured (beswangert, lit. impregnated) upto one third or a little more or less in the mada or the

78. Van Dam, II(3), p.79.
second vat. By and by, eight persons on a board, of which four were men and four women, were engaged according to some “unknown superstitions” of the Muslims.\textsuperscript{79} The men were divided crosswise and the women occupied the places in between. Each of them was provided with a churning staff. With these instruments they stirred the liquid straight up and down in the \textit{mada}. During this operation, one labourer would go into the vat and press out the liquid in the middle with the whole body. He continued to up and down for a quarter of an hour and then he came out of the vat. After it, the churning action started straight away. It was very evenly done so that the liquid could be pressed from all the sides. It used to be raised up to 3 to 4 feet above the brim in the middle of the vat. Men and women equally contributed to the stirring. This operation used to last for three hours.\textsuperscript{80} Perhaps by this time froth would disappear. Only then was the beating discontinued.\textsuperscript{81} Meanwhile, some time was spent on leaves of inferior quality which had earlier been found to be greasy or poorer. They were soaked and steeped till 2, 3 or 4 preparations were made and after that these were dumped into the ‘\textit{sjaernia}’. There they started mixing with the accumulated liquid. It could produce approximately \(\frac{3}{4}\) man (i.e. 17 ceers) of dry indigo. It was dumped on

\textsuperscript{79} Ibid.

\textsuperscript{80} Ibid., p.80.

\textsuperscript{81} \textit{D.E.P.I.}, IV, p.432. Watt also refers to approximately similar operation in the beating. However, he does not refer to any labourer entering into the vat and moving the liquid with his whole body.
mouri which was a superfine red sand dust found near Sarkhej. This was done before the surplus water was baled out from the sunken substance below and then it was released.

The useless fluid was drained out. A flat ground was arranged. It had a square shape of 6 ell (in length and 4 ell) in width. A space of a foot was dug out. Over this pit, a closely woven cloth (sjaal) stitched together to meet the required expanse was spread out. In this the mixed indigo-paste was put in. The useless liquid would drip down through the cloth. This was done for a full day (24 hours) or two days (48 hours), or as long as it was needed. Next, this dry paste was scraped through with the help of coconut-shell or potsherds from the sides of the cloth and hoarded up in the middle. This was done usually in the afternoon. This 'pudding' was then covered and left in the same cloth to dry under the sun till next day. When it was considered fit for making balls, the mass was put in lumps into the condi or pots with handles. In order to have the mass uniformly prepared, it was subjected to kneading in the condi. This was not to be made too thin. From this condi, the pudding was spread on an even ground and finally balls were made.82

There was an interesting social aspect to indigo manufacture. The Hindu peasants in Gujarat raised the indigo plant, but the manufacturing process was undertaken by Muslims. Van Heck clearly mentions that

82. Van Dam, II(3), p.81.
“the makers of the indigo are Muslims (mooren).”\(^{83}\) Evidently the situation remained unchanged till the 19th century when the Broach Gazetteer (1820) says of Cambay that the “Hindu peasants disliked growing it, because in making the dye much insect life is lost, while the Muhammadans, with whom this objection has less force...”\(^{84}\)

Indigo was cultivated in peninsular India at various places. Its cultivation was reported from Jaitapur in West Deccan.\(^ {85}\) Anthony Shorer refers to indigo cultivation in Nagalwancha in east Daccan.\(^ {86}\) Indigo was grown in several parts of Coromandel, but the products of Masulipatam and Tierepopelier (Tirupapaliyur, factory established) in 1608\(^ {87}\) were considered best.\(^ {88}\) There is a report of 22 June 1688,\(^ {89}\) a description written

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83. Van Dam, II(3), p.74.


85. E.F.I. 1624-29, p.258.


88. Tapan Raychaudhuri, Jan Company in Coromandel 1605-1690, p.9; see also, S. Arasaratram, Merchants, Companies and Commerce on the Coromandel Coast 1650-1740, p.54; Irfan Habib, The Agrarian System of Mughal India 1556-1707, p.47 especially footnote no.67.

89. The author of this report is not known, see Dr. F.W. Stapel’s observation about the author in the foot number 2 in Van Dam, II(2), pp.192-193.
by Commissioner General Van Rheede tot Drakesteyn, lord of Mydregt of December 1688\textsuperscript{90} and Daniel Harvart’s report\textsuperscript{91} which provide significant information relating to various aspects of indigo manufacture.

All the abovementioned sources are unanimous on the question of choice of land to be used for indigo cultivation. It was cultivated on sandy fields. Havart writes specifically that the best soil for indigo cultivation was one in which two thirds area was under sand and one-third under clay.\textsuperscript{92} He, however, noticed that around Tegenapatam (Tegnapatam) situated on the south of Coromandel, indigo was grown simply on sandy soil.\textsuperscript{93} It was because of variety of good soil.\textsuperscript{94} However its yield was reportedly very poor in the sandy-soil.\textsuperscript{95} According to Van Mydregt indigo grew “on sand and sandy clay fields, (because they are) nitrous in nature, the clayey earth is not good.”\textsuperscript{96} Mostly high and dry lands were preferred “because the rain, which ordinarily falls, is sufficient for the growth of

\textsuperscript{90} Ibid, p.201.

\textsuperscript{91} Harvart, II, pp.19-26 and III, pp.20-25.

\textsuperscript{92} Harvart, II, p.20.

\textsuperscript{93} Ibid.

\textsuperscript{94} Ibid.

\textsuperscript{95} Ibid.

\textsuperscript{96} Van Dam, II(2), p.202.
this herb." The low land which could be watered stifled the growth of indigo and consequently produced a weak and watery indigo. It was observed in later 19th century that bright sunshine contributed to the quality of the dye. The report of June 1688 speaks of the area around Tegenapatnam where indigo was cultivated: “The land, where the large quantity of indigo is sown, extends itself from Tegenapatnam, where much of it is purchased, southwards at 6 and 7, [hours’ journey] in the north 9 and 10, and in the countryside from South to the Northwest, 16, 18 and 20 hours; this seed, which is called auwerywirre (the Tamil word for the indigo plant is avery), is sown in the beginning of January...”

The land was ploughed once or twice approximately one foot deep around September and was left unsown till the end of the rainy season, till December, when the land was ploughed up once more. The seed, which was softened by the rainy weather, was sown with the help of a harrow. Within five days it used to sprout. As the plants appeared on


98. Ibid.

99. D.E.P.I., IV, p.413, refers to the dry land cultivation of indigo which depends on rain-based ploughing of the sandy soil.


102. Ibid. Watt refers to the use of a drill, see D.E.P.I., IV, p.413.

103. Van Dam, II(2), p.193.
the and obtained a size four fingers' broad, then unwanted herbs were weeded out.\(^\text{104}\) The plant was allowed to grow till February when the leaves at the bottom become yellowish and bore fruit and seed, the first cutting should take place.\(^\text{105}\) Extreme care was taken in this operation. The small branches which came out from the main stem were to be left uncut to the diameter of an arm's length.\(^\text{106}\) The crop was harvested three or four times in a year.\(^\text{107}\) The first cropping was done in March-April, second in May-June, third in July-August and the fourth in September-October.\(^\text{108}\) Each crop was ready for cutting with an interval of approximately three months.\(^\text{109}\) They were cut at about four fingers above the ground.\(^\text{110}\) If cut below that level they would not resprout.\(^\text{111}\) Plants were left for seed after the third cutting to be used for sowing in

\(^\text{104}\) Havart, II, p.20; see also \textit{D.E.P.I.}, IV, p.413.
\(^\text{105}\) Ibid.
\(^\text{106}\) Ibid.
\(^\text{107}\) Ibid., Havart speaks about three cuttings in a year whereas the reports of 22 June 1688 and December 1688 speak about four cuttings in a year, see Van Dam, II(2), pp.193-202.
\(^\text{111}\) Havart, II, p.20.
the next season.112

After the third cutting, the plants were incapable of any future growth.113 The remaining stubble was burnt because the ash provided manure to the cultivation of indigo.114

Lopped off branches were placed on a smooth and hard ground situated near it for four hours in the afternoon (because the cuttings used to take place around 9:00 a.m.) so that it became dry.115 The report of June 1688 tells us that the leaves were cut in a bright sunny day because the leaves would then quickly dry for a day.116 Those leaves which still remained in the branches were threshed with sticks.117 But such leaves were not suitable for indigo extraction after they lost much of their substance due to harsh beating.118 Havart also speaks about the use of sticks in separating the leaves from the plants.119 These were then taken up and brought in baskets (manden) to a dry enclosure till the next day.

112. Havart, II, p.21. But plants were allowed to seed even after the fourth cutting, see Van Dam, II(2), p.193.


114. Ibid.


117. Ibid.

118. Ibid.

Such leaves were called *auwery-elle*.\(^{120}\) The leaves after the first cutting, according to Van Mydregt unlike Havart’s account, were kept under the sun for 8 to 10 days and then placed in a closed place.\(^{121}\) They were then spread out upon a dry ground in the open air.\(^{122}\) Left to dry up, they were by beating and striking reduced to pieces.\(^{123}\) Then they were stored in a closed dry place which was protected from wind, piled up loose upon each other, on mats.\(^{124}\) It was kept like this for 25 days, till the leaves became fit for indigo extraction.\(^{125}\) Then drying up in the sun helped in two ways. Firstly it helped in drawing out water from the leaves; and secondly by knocking, twigs and small sprouts were separated and broken.\(^{126}\) This was necessary for indigo manufacturing.\(^{127}\)

We are told that one acre of land, square in size, called ‘cany’ was about 3200 square feet and was hired for one year,\(^{128}\) presumably by the

\(^{120}\) Van Dam, II(2), p.202; Havart, II, p.21.


\(^{122}\) Ibid.

\(^{123}\) Ibid.

\(^{124}\) Ibid.

\(^{125}\) Ibid.

\(^{126}\) Havart, II, p.21.

\(^{127}\) Ibid.

\(^{128}\) Van Dam, II(2), p.202. Therefore one cany was equivalent to 3200 feet or an area of 640000 square feet or ± 62600 M.
Dutch East India Company and 8 to 10 fanums were paid in rent.\textsuperscript{129} One pagoda was equivalent to 6 guilders and 18.5 fanums made one pagoda. Therefore the annual rent amounted to 3.23 guilders. Six mats (ceers) of seed were required to sow on such a block of land.\textsuperscript{130} According to Havart, about 12 markal [maten i.e. ceers] of seeds were needed.\textsuperscript{131}

According to the Report of 22 June 1688, one acre of land in good harvest yielded 20 to 30 maten (ceers) of indigo leaves for one fanam, and in the time of poor harvest sold for 8, 10, and 12 ceers per fanam.\textsuperscript{132} The cultivators used to earn 15, 20, 25 and 30 fanams from the seed.\textsuperscript{133} In times of good harvest, they could earn as much as 70, 80 to 90 fanams from the seed which they sold to others exclusive of the rent.\textsuperscript{134} According to Van Mydregt’s report (Dec. 1688), around 6 fanams were spent in wages in cultivating one acre of land. He estimated that an ordinary crop would bring a modest profit of 25 fanams and in a very good season it would be more than 75 fanams and in a very advantageous time it would be well over 5 cents (i.e. 1 cent was 100 per cent of the capital).\textsuperscript{135}

\textsuperscript{129} Ibid., pp.193-202.
\textsuperscript{130} Van Dam, II(2), p.193.
\textsuperscript{131} Havart, II.p.22.
\textsuperscript{132} Van Dam, II(2), p.193.
\textsuperscript{133} Ibid.
\textsuperscript{134} Ibid.
\textsuperscript{135} One square rod was equivalent to 10 Dutch decameter.
The two reports of June 1688 and December 1688, do not speak about source of water. However Havart writes that the prepared leaves were brought near a well or river whose water should be clean, clear, and not muddy irrespective of water being sweet or brackish.\textsuperscript{136}

The dry leaves were put into a few low wide mouthed pots, one foot high and one and a half foot wide in the mouth contained three parts (parrea?) water in order for the leaves to soak in it.\textsuperscript{137} Narrow mouthed vessels, these were three feet high and inside three-fourth part wider than the height. They used to be filled with indigo water to be churned in order to extract indigo out of the water into which it first dissolved. What is surprising is the fact that these were earthen pans, being called 'tutti chaals' by the natives.\textsuperscript{138} The low wide-mouthed pots, two third filled with water were then filled with prepared leaves. Each pot could contain twenty four pounds.\textsuperscript{139} The leaves were stirred, from morning till 10 o' clock, and then after the midday left under the hottest sun for two hours.\textsuperscript{140} During these four hours the leaves first began to swell, and consequently a foamy stuff like yeast was thrown up which finally turned

\begin{itemize}
\item \textsuperscript{136} Havart, II. p.22.
\item \textsuperscript{137} Havart, II, pp.22-23.
\item \textsuperscript{138} Van Dam, II(2), p.194.
\item \textsuperscript{139} Havart, II, p.23.
\item \textsuperscript{140} Ibid.
\end{itemize}
very purple. It was the sign of knowing that the leaves had been adequately soaked.

Then a thick cloth was firmly bound over the mouth of collection pots and ladled out in another narrow-mouthed pot, from the soak-pots. First the watery substance of the soaking pot was of green colour. It was stirred again, and then poured through the cloth in collecting-pots. Thereafter the softened leaves were pressed with both hands over that cloth and that was put again in the soaking pots. Fresh water was poured in once again and once more the contents were stirred and kneaded. Then water was ladled out as earlier, into collection-pots. The leaves were once more pressed by hands and the sap thereof was run through the collected indigo-laden water. The pushed out leaves were then put in the softening pots. Thereafter they used to take the scoop-pot and covered all around with pressed out leaves, was therein buried. Fresh water was poured on it so long that the scoop pot began floating. This water was bailed out when the dye from the leaves had dissolved in water. It was again poured into the collection-pots as earlier. This work was continued till the water no more showed any greenness. The leaves now remained good only for use as fertilizer especially in the rice fields. Each collection

141. Ibid.
142. Ibid.
143. Ibid., pp.22-23.
pot having been filled from each softening pot, a piece of cloth was bound on the mouth of the collection-pot. Then this purple foam would float and the rest of the water would be strong green. Later it was churned like milk.  

The churning continued till the foam became white and eventually turned into a light blue colour. The water would become completely black. When it was sufficiently churned, after one or two hours and sometimes even four hours, with churning stick, the pot was covered with cloth and left undisturbed to allow turbidity to sink and so separate from indigo.

Next morning around 8 o’clock, the plug was taken out from the hole that was around one elbow above the lowest ground of the collection pots. All thin moisture was let out as appeared reddish. Still in the pot a purple foam floated, and at the top of the water a few red and yellow spots of shine appeared. This ground sap was poured out. The remaining slush was kneaded twice or thrice and was put in wooden cup in order to be spread on a bed of sand to dry up. It was placed on a cloth and let to dry under the sun. So dried, the indigo was now ready for the market.

In this way it has been estimated that genuine indigo was approximately made 11000 seers or 19,250 Dutch lbs. from good substantival leaves weighing 480 lbs.


146. Van Dam, II(2), p.196.
Besides this process, they also used to manufacture indigo by boiling the indigo slime. This provided a beautiful colour but at the expense of the strength.\textsuperscript{147} Since the use of boilers in Indian Indigo production has not been otherwise described an extract from the report of 22 June 1688 is given below:

"The unadulterated boiled indigo is prepared from the pure stuff, such as the nature produces, as has been described, taking out the indigo-slime, that is fetched from the pots, firstly, put not on any sandy bed, but on the contrary poured into an earthen tray, and the same would be set on fire, to boil. During this boiling the same would be stirred continuously, since it rises up so swiftly, that it would not otherwise be held back. Consequently the stirring should continue long as to keep it from rising allowing to boil quietly, approximately two hour’ long, till the same (the foam?) gets a copper-red colour. It is now taken up from the fire, and put on a bed of sand, covered by a piece of cloth in order to draw out the humidity. The (remaining) water may be poured out yet since the earthen tray, where the same is boiled, is too hot to handle, one takes the tray out of fire and let it stand, till it becomes little cooler and capable of being handled, when one pours slime from that on to the sandy bed, as above said; the liquid part being pressed out from the said slime, one takes off from the cloth and put it in a pot. It is then firstly would be beaten like starch, till it gets dried in the sun on a piece of cloth, that is laid on ash,

\textsuperscript{147} Ibid, p.204.
so that indigo is now made. This boiled indigo sticks together by the boiling, because of which reason the same is not so brittle as the uncooked, pure stuff; still through the fermentation the same loses much of its strength, so consequently that which is to be used as dye is not so profitable as the, pure stuff, as indicated above. The cooked indigo, of which a sample is being sent, has among the natives the name of neelam goen serkee. Out of a little less or more from 11.000 mats (seers) or 19.250 lbs. of leaves, 480 lbs. (of indigo) can be made...”

“Yet there is another kind of cooked indigo that is made by the natives, that is nowhere so good as narrated earlier, because the same is manufactured from crude indigo, that is too weak and so is further rubbed (?) in pieces. After that is well rubbed, it is put in earthen tray, that is filled with water, then is well stirred, and then allowed to settle down, and the sediments being coarse and fine, mixed settle down at the bottom. (The indigo) sediments sinking to the bottom the water is taken away gently from above, and poured into another tray till again there are no (indigo) pigments in the water, standing still. After the water is entirely clear, one pours it out gently from above. At the bottom is the indigo, from that finally the best sediment and subtle dirt can be taken, as one can see well enough. After that this water, as above said, is run off from the indigo, ... (The indigo) is cooked together with the back of a tree ... called by the natives maga marram inside the tray putting it on the fire, and allowing the boiling in the manner, as said here- above. When the small cakes, that are laid on the cloth in round balls, about half the
humidity is extracted out and the indigo is carefully made into small square biscuits…”

“The third kind of cooked indigo is made by the inhabitants, mostly like the first, the solitary distinction therein is this, that the fine sand and slime which through rubbing from the cloth, is diluted into the water, and so reaches the pot, settling down at its bottom. Taken out from there, along with slime it is mixed with other. It on the contrary, a man desires pure stuff, durt is not allowed to enter the indigo, so that this kind of stuff is more or less slimmed by 1/5, and so, may not have the name of pure cooked indigo…” 148

The Dutch East India Company had an indigo dye-house at Tegenapatam, or Diwanapatam for dyeing the cloth purchased there.149 The reason ascribed for operating the dye work there was that the indigo of south Coromandel was cheaper than the indigo from North Coromandel which grew around the quarters of Palewanze (Palavancha) situated close by Nagalwanze (Nagalavancha) though the north indigo was considered better than that of South.150 Secondly the indigo from South was in demand for the reason that cloth dyed in purely northern indigo would have made the cloth more expensive.151 The indigo produced in South Coromandel,

148. Ibid., p.198.
149. Havart, I, pp.48-49.
150. Havart, I, pp.48-49.
151. Ibid., Havart, III, pp.20-21.
at Tegenapatam was considered soaked-indigo and 'turbid'\textsuperscript{152} and was certainly better but was three times more expensive.\textsuperscript{153} It was also considered stronger and better.\textsuperscript{154}

The export of indigo from South was always one of the chief concerns of the Dutch East India Company.\textsuperscript{155} The demand for Southern Indigo kept pace with the expansion of the Company's activities in the subsequent period.\textsuperscript{156} Besides the increasing demand from Holland, the rising price of indigo in Surat and North India also contributed to expansion in the demand of indigo from the southern peninsula.\textsuperscript{157} On an average the demand from Holland fluctuated between 170,000 to 100,000 lbs. upto the 1630's.\textsuperscript{158} In the middle of the seventeenth century it was around 30,000 lbs.\textsuperscript{159} It yielded a gross profit of 234 per cent by 1667-68.\textsuperscript{160} By 1690's it was estimated that twenty thousand pounds of indigo

\textsuperscript{152} Havart, III, p.20.

\textsuperscript{153} Ibid.

\textsuperscript{154} Ibid., p.21.

\textsuperscript{155} Tapan Raychaudhuri, pp.162-163.

\textsuperscript{156} Ibid, pp.163-164.

\textsuperscript{157} Ibid, p.163.

\textsuperscript{158} Ibid.

\textsuperscript{159} Ibid, p.164.

\textsuperscript{160} Ibid.
from the South were sent annually to Holland.\textsuperscript{161} Havart is obviously not
taking into account the quantity that was used in Company’s dye house
and handled by local merchants. In the Company’s dye-house dyeing
was carried on continuously because twenty-two dyers were employed
and paid wages on a monthly basis.\textsuperscript{162} They were daily dyeing thirty
packs of guinees cotton cloth, 15 packs of Salempuris, and Bethilles.\textsuperscript{163}
What is rather striking is the fact that coarsest kinds of cloths were
preferred for dyeing.\textsuperscript{164}

\textit{Al} (Morinda Citrifolia) was another vegetable dye. In Akbar’s time
this crop was raised in the ‘parganas’ of Phaphund and Kalpi,\textsuperscript{165} Kutia
and Kalinjar.\textsuperscript{166} In the 19\textsuperscript{th} century too it was absent from most of the
Gengetic plains; being confined in Uttar Pradesh, it was confined to
Bundelkhand region and to the southern parts of Fatehpur and Kanpur.\textsuperscript{167}
Thus the area of its cultivation remained unaltered from the \textit{Ain}’s time to

\textsuperscript{161} Havart, III, p.21.

\textsuperscript{162} Ibid.

\textsuperscript{163} Ibid.

\textsuperscript{164} Ibid.

\textsuperscript{165} \textit{Ain-i-Akbari}, II, p.362.

\textsuperscript{166} Ibid, p.351.

\textsuperscript{167} \textit{D.E.P.I.}, V, p.263.
Indian madder (Rubia Cordifolia) was found in Ghazni (Northern Afghanistan), the Himalayas and in Sind.\textsuperscript{170} It was also imported from Persia.\textsuperscript{171}

Dye was also obtained from myrobalans. It was found in the mountains of Kumaun and Garhwal\textsuperscript{172} and in Gujarat.\textsuperscript{173}

In the Deccan and South India, chayroot (\textit{Oldenlandia umbellata}) was an important vegetable source, yielding a red colour. It was grown around Machhilipattam, Divi Island, Nizampattam, Ganjam and Pulicat.\textsuperscript{174}

Cesare Federici (1588) refers to the use of chayroot. He writes, “also they make in Sane Tome, great store of red yarne, which they dye

\textsuperscript{168} D.E.P.I., V, p.263.

\textsuperscript{169} G. Watt, \textit{Commercial Products of India}, p.783.

\textsuperscript{170} \textit{Ain-i-Akbari}, II, p.434; Pelsaert, p.32.

\textsuperscript{171} E.F.I. 1622-1623, p.23.


with a roote called Saya, and this colour will never wast, but the more it is washed, the more redder it will shew: they lade this yarne the greatest parte of it, for Pegan (Pegu), because that there they worke and weave it to make cloth according to their owne fashion, and with lesser charges.”

Philippus Baldaeus (1672) is perhaps the first author to give a detailed treatment to the chay root. He informs us that from Paliacatta (Pulicat) to the further north were situated Penna and Caleture, and between these places the best kind of Essaye (chay) root was produced. He writes, “The Essaye (which also occurs in the islands of Ceylon) is a small root like an offshoot, the best kinds are half a yard long (i.e. 45.7 cm) and are dug out from the ground. In order to judge which is the best Essaye, the following is done: one should break them into pieces, and pay attention to deep red colour. Also it is taken into the mouth and chewed, and so if that is nitrous in taste, it is considered good. To test it on the cloth on which is to be dyed with Essaye is placed, one proceeds in the following manner. One should rub hard the cloth (dyed with the chay root) with the juice of lemon and then allow it to dry under the sun. If false, the red colour shall change its hue. There is also an oblong pentagonal fruit, named Carunbolle, whose juice is still more caustic than the lemon, and


is also very good to test the virtue of the Essaye."\textsuperscript{177}

Baldaeus refers to the use of a poor substitute of chay root used in Orissa. He says, "One must keep a close watch, else one could be deceived by the deceitful nation: because they frequently use false Essay in painting (printing), named Sordaco, also a bark of certain tree growing in Orissa. You will find that the painting (printing) will be darkish red, and if the cloth is rubbed between the hands with fresh water, it will show him the (real) colour at once."\textsuperscript{178}

Lac is well known for its dyeing property. It was produced by an insect (Coccus lacca) feeding on plants. Lac was widely collected in India, particularly Gujarat,\textsuperscript{179} Uttar Pradesh,\textsuperscript{180} Assam,\textsuperscript{181} Bengal\textsuperscript{182} and the Deccan.\textsuperscript{183}

It was reported in the 1650s that at Surat water in which gum-lc had been steeped was sold to dyers "that dyes red seales (sela cloth)."\textsuperscript{184}

\textsuperscript{177} Ibid.
\textsuperscript{178} Ibid.
\textsuperscript{179} Thevenot, p.44, says that it was gathered near Sankheda.
\textsuperscript{180} P. Mundy, II, pp.151, 153.
\textsuperscript{181} Tavernier, II, pp.221.
\textsuperscript{182} Ibid, II. pp.18-19.
\textsuperscript{183} \textit{E.F.I. 1624-1629}, p.258.
\textsuperscript{184} \textit{E.F.I. 1655-1660}, pp.240-41.
By the mid-18th century, the *Nuskha Khulasatul Mujarrebat* transcribed c.1763, shows that thirty-two colours were obtained from various dyes.\textsuperscript{185}

The simplest way for applying colour to the cloth was achieved by simple immersion in the dye. The *Miftahu’l Fuzala* (1468-69) refers to the dyer (*rang-rez*).\textsuperscript{186} An accompanying illustration depicts a dyer at work with two vats before him and the dyed pieces of cloth are shown hanging and drying behind (Pl.XVI).\textsuperscript{187}

Besides simple immersion in dye, colours were applied to cloth in various other ways, namely, by the tie-and-dye method, ‘*bandhanon*’ or ‘*gulband*’, the use of resists to confine the colours to patterns; use of printing blocks and by painting with pencils (*qalamkari*). (The ‘patola’ method, which can be treated as a special form of dyeing is treated by us a form of weaving).

Among these techniques, the ‘tie-and-dye’ or knot-dyeing (*bandhana*, anglicised ‘bandanna’)\textsuperscript{188} method was practised in India since ancient times. There are two references to it in the *Harshacarita* (7th


\textsuperscript{186.} *Miftahu’l Fuzala*, s.v. *rang-rez*.

\textsuperscript{187.} Ibid., f. 133b.

\textsuperscript{188.} *Oxford English Dictionary*, s.v. *bandanna*, it suspects that this term was probably adopted first in Portuguese.
century). Moti Chandra has traced a reference to it in the *Manasollasa*, a 12th century work. Abul Fazl lists *bandhanun* among the kinds of cloth whose manufactures had prospered in Akbar’s workshops. The *Bahar-i Ajam* (c.1740) describes it under the name ‘gulband’ or ‘gulbandi’. It says, “Gulband” is a kind of cloth, which is dyed upon being tied up with threads, and in the language of India is called *bandhanun*. Mirza Tahir Wahid is quoted for a verse in which he compares the spot (dagh) of the *bandana* or *gulband* to the pattern of the artist in chintz (*chit*). Yule and Burnell offer a quotation of 1752 for ‘bandannoes’ an obviously intermediate form between *bandhanun*

189. Banabhatta, *Harshacarita*, ed. P.V. Kane, 2nd edn., Delhi, 1965, *Ucchvasa*, I, kusumbharaga-patalam pulaka-bandha-citram candatakamantah-sphutam sphantkbhumiriv ratnanidhanam dadhana’ (tr. on p.69, ‘wearing a petticoat red with safflower dye, variegated with spots of different colours and gleaming inside (the gown) as though she were a crystal spot bearing a treasure of jewels, *Ucchvasa*, IV, p.14, ‘bahuidhabhakti nirmana nipuna purana paura puramdhri badhyamanairbaddhaischa’, tr. V.S.Agrawala, “References to Textiles in Bana’s *Harshcharita*”, *J.I.T.H.*, IV, Ahmedabad 1959, p.66, “The ‘old matrons’ were skilled in many sorts of patterns (bahvidha bhakti), some of which were in the process of being tied (badhyamana), and some had already been executed or got ready (baddha)”.

190. Moti Chandra, p.124.


192. *Bahar-i Ajam*, s.v. gulband wa gulbandi.

193. *Bahar-i-Ajam*, s.v. gulband wa gulbandi.
and mod. English ‘bandanna’.\textsuperscript{194} The use of the word has continued into modern times.\textsuperscript{195}

Indian textile craftsmen of 17\textsuperscript{th} century were familiar with two primary methods of multi-colour of pattern-dyeing. They were, first, the use of resists to confine the colours to pattern.\textsuperscript{196} and, secondly, the use of mordants to take colours.\textsuperscript{197} Printing blocks were probably in use to apply the resists and mordants in China as early as 140 B.C.\textsuperscript{198} and in Egypt and Iran during 3\textsuperscript{rd}-4\textsuperscript{th} century A.D.\textsuperscript{199} In Europe, wooden blocks were used for simple colour printing till late in the 17\textsuperscript{th} century.\textsuperscript{200} But the use of mordants and resists irrespective of the means of application, that

\begin{footnotesize}
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\item \textsuperscript{194} Long, quoted in Hobson-Jobson, s.v. bandana.
\item \textsuperscript{195} Cf. Istilahat-i-Peshawaran, II, p.53, (s.v. bandano), p.40, (s.v. chundari).
\item \textsuperscript{196} E.F.I. 1634-1636, pp.82-83, “Notwithstanding, wee intreated Fremlen to inform himself of the order thereof and whether it might not be done upon Coulored cloth as well as white cloth, whereunto he replies that it cannot be done but upon white cloth onely, and that in peeces not above 4 or 5 yards at the most, which is stayned after the forme of the fine paintings of Masulapatan, and put into so many dyefatts as there are severall colours, that part of it which must not take the dye being covered with a kind of earth, the rest which is uncovered takes the colour of the dye whereunto it is put”.
\item \textsuperscript{197} Methwold in Relations of Golconda, p.35; John Fryer, p.90.
\item \textsuperscript{198} Hans. E. Wulff, p.224.
\item \textsuperscript{199} Forbes, IV, p.137.
\item \textsuperscript{200} Ibid., p.138.
\end{itemize}
\end{footnotesize}
is, whether with, printing or painting, gave far better results.

Here it would be appropriate to mention that dyeing of shawl wool was apparently not practised till Akbar tried it. We hear from Abu’l Fazl that Akbar endeavoured to dye tus wool and discovered that it did not receive red colour.\(^{201}\) Abul Fazl writes, “the white alcha also called tarhdar, has natural colours. Its wool is either white or black in colour. It is woven in three ways: (all) white, (all) black or mixed. The first (white) in old times could take no more than three or four colours. But His Majesty has made it many-hued (gunagun) [i.e. succeeded in applying many colours to it]”.\(^{202}\) In other words, Akbar tried to explore which dyes suited wool well.\(^ {203}\)

\(^{201}\) Irfan Habib, “Akbar and Technology”, p.134.


\(^{203}\) Ibid.
6. COTTON PAINTING

Calico-painting was an art, and its products were quite different from the printed calico though the name chhint (chintz) applied to both. The painted chintz was obviously a high value article and would have been produced only in small quantities.

India had acquired a distinct position for its painted cloth. But European references to painted cloth make it difficult to distinguish painted cloth from printed cloth, because the modern exponents of Anglo-Indian usage like Yule believed that the word ‘pintado’ was applied to all “printed goods”,¹ while 17th century writers frequently considered it to be a mere synonym of chintz.² Bernier (1664) refers to “Masulipattam chites” as “painted by hand”.³ Tavernier (1667) describes, “the chites or painted cotton cloths which are called Celmendar (kalamkari) that is to say painted with a brush (qalam)”⁴

Mulla Tughra, a 17th century poet, refers to the pencil of the chintz maker when he says “If a friend does not have chintz of sharp (bad) pencil, then the chintz is no bribe (rushwa)”⁵ Mirza Tahir Wahid also


². Eg. Mundy, II, p.98.


⁴. Tavernier, II, p.4.

⁵. Bahar-i-Ajam, s.v. chitsaz, chitgar.
refers to the chintz (chit) made by a painter (qalamkar).\textsuperscript{6} The \textit{Bahar-i-Ajam} defines \textit{qalamkar} as "cloth on which figures are drawn by pencil".\textsuperscript{7} Later in Beaulieu's MS c. 1734 and the two letters of Jesuit Father Coerdoux written in 1742 and 1747 give a detailed description of calico-painting practised in the Carnatic.\textsuperscript{8}

Cotton painting was a highly specialized craft of medieval textile industry. Regarding its antiquity or origin nothing can be said definitively, but will also be inappropriate to claim, as Irwin does, that "printed" as well as "painted cottons" were not made on the Coromandel coast in the seventeenth century.\textsuperscript{9} In his subsequent observations he himself seems to have revised his opinion.\textsuperscript{10} P.R. Schwartz has brought forth French evidence on Indian cotton painting in two of his studies.\textsuperscript{11} Both deal with

\textsuperscript{6} \textit{Bahar-i-Ajam}, s.v. gulband wa gulbandi

\textsuperscript{7} Ibid, s.v. qalamkar


\textsuperscript{10} John Irwin, "Golconda Cotton Paintings of the Early Seventeenth century", \textit{Lalit Kala}, 5, eds., Karl Khandalavala and Moti Chandra, New Delhi, 1959, p.12.

18th century documents. The evidence we could collect from 17th-century Dutch sources, therefore, assume significance. Pieter van den Burg (P.V.D.B.) wrote his account in 1677.12 And Hendrik Adriaan van Rheede wrote his account in 1688.13 Daniel Havart commented on this craft in 1693.14 Of these three, Hendrik Adriaan van Rheede’s account is quite elaborate and will be discussed at some length here.

But, first, a few introductory words:

The Dutch had realized the importance of Coromandel Coast for the procurement of ‘pintados’ or ‘painted’ goods right from the time of their initial settlements at Petapoli in 1606.15 Petapoli had the advantage of producing superior quality painted cotton piece-goods on account of the dye produced there. The English factors writing on 25th October 1634 reported, “Pettipolee [Petapoli] must likewise be continued, chiefly for reds, because no other place affords the like colour; and these we shall also fitted with the finer sorts of cloth that is required for the southwards


13. Hendrik Adrian van Rheede’s account is printed in Van Dam, II(2), pp.205-209.


15. W.H. Moreland, From Akbar to Aurangzeb, p.32.
factories....".  

Besides Petapoli, Palakkollu was another important centre of cotton-painting. It has been estimated that painted cotton-piece goods at these two places were 30 per cent cheaper than emporium town of Masulipatam.

It seems that painted cotton piece-goods were not available on large scale. The problem of procurement was further accentuated by the attempts of the king of Golconda in 1635-1636. President Willoughby and Council at Bantam wrote on 31 January 1636:

"The which paintings in former times were procured near Musulpatnam. Which (as it seems) was before the great Magore and Persian took so great affection unto fine paintings; but after that they delighted therein, the said places adjacent Musulpatnam were wholly taken up for their use, with command from the king of Golcondah (whose country it is) that the painters should only work for them; whereupon the Dutch provided their paintings at Pullicatt and Pooloesere [Pondicheriri (Pulchari), and the English procured (not without both charge and difficulty) a factory in Armagon, to there provide their proportions also..."


18. Ibid.

This passage speaks of the intervention of the king of Golconda in the trade of cotton paintings. Cotton paintings were used for the king's personal use and partly for his and his nobles' overseas commerce with Persia.\textsuperscript{20} It had a ready market in the Mughal dominions also. Bernier (1665 A.D.) wrote about the Mughal imperial encampment and its extensive use of \textit{kanats},\textsuperscript{21} in which connection he talks of the painted chintz:

"These Kanates are of a strong cloth which is lined with \textit{chittes} or cloths painted with \textit{portages} with a great vase of flowers. In the centre of one side of the square is the royal Entrance, which is large and magnificent and the \textit{chittes} of which it is made, as also those which face the exterior of all this side of the square, are much more beautiful and rich than the others... Beyond this are the private tents of the King. Which are surrounded by small \textit{kanates} of the height of a man, and lined with painted \textit{chittes}, of that fine workmanship of Masulipatam, which represent a hundred different sorts of flowers; and some are lined with flowered satin with long fringes of silk."\textsuperscript{22} It seems one of the chief uses

\begin{footnotes}
\item[22] Ibid.
\end{footnotes}
of cotton paintings under the Mughals was for tent-hangings or more specifically for the decoration of *kanats* or screens used in surrounding the tents. This was presumably a continuation of 16\textsuperscript{th} century practice. The *Kanat* depicted in 16\textsuperscript{th} century paintings of the *Hamza-Nama* have been found to be very similar to those of Bernier's descriptions.\textsuperscript{23} Besides the southern provinces, cotton paintings were also manufactured at Burhanpur (Khandesh),\textsuperscript{24} Sironj (Rajasthan),\textsuperscript{25} Agra and Lahore during the 16\textsuperscript{th} – 17\textsuperscript{th} centuries.\textsuperscript{26} Nearly all major travellers and the companies have reported about these places as production centres of cotton painting piece-goods. It appears from Hendrick Adraan Van Rheede's account that Sadraspapatnam had emerged as a strong centre of the cotton-painting craft. He writes, "the best painters of South coromandel were found at Sadraspapatnam."\textsuperscript{27} Van Rheede observed that Sadraspapatnam had clean water which provided the best lustre and firmness and made it distinct from paintings produced at other places.\textsuperscript{28} He writes further that "this

\textsuperscript{23} John Irwin and Margaret Hall, *Indian Painted and Printed Fabrics*, I, Ahmedabad, 1971, p.23.

\textsuperscript{24} Ibid.

\textsuperscript{25} Ibid.

\textsuperscript{26} Ibid.

\textsuperscript{27} Van Dam, II(2), p.205.

\textsuperscript{28} Ibid.
manner of painting is not known in Europe”.\(^\text{29}\) He found it so attractive that he took pain to write a detailed account.\(^\text{30}\)

Rheede tells us that the half bleached cloth was first prepared with an aqueous solution of fat and astringent (buffalo’s milk, mixed with myrobalan). It was followed by ‘beetling’. This provided a smooth surface to the cloth. Havart writes that *Parcallas* (*parkala* cloth) of twelve covids long, “that is little more than eight ells, were used.”\(^\text{31}\) The cloth intended for painting was prepared in two ways. Van Rheede writes, “.... And firstly they take the fruits, here named carica, being unripe, but at other places ripe, according to the quantity of water in full wetted with alum-water. The cloth prepared in this manner, received a yellow colour from the carica”.\(^\text{32}\)

Apart from this, there was another method of preparation of the cloth for painting. “The second preparation is done with cansje (*cangi*), being water, that is strained off from cooked rice, and with carica without milk, which is handled in the previously described manner”.\(^\text{33}\) The difference lay in the fact that those parts of the cloth “which they wished

\(^{29}\) Ibid., p.206.

\(^{30}\) Ibid.

\(^{31}\) Havart, III, p.13.

\(^{32}\) Van Dam, II (2), p.207.

\(^{33}\) Ibid.
to hold white, was painted hot and was covered, as the cloth was put into the dye vat.”

Van Rheede informs us about the colours, which were in use during those days: “The colours, with which cotton are coloured or painted, are red, blue, green, purple and black. The red is from four and possibly a variety of roots and rinds, whereof the most beautiful is called Saya were (chay root), being a shrub as the common health, having small, oblong leaves, divided in many branches, bearing small white flowers of four pointed leaves, in whose calyx (kelkjens) many small oval elliptic seeds are enclosed. They grow on the east and north part of the island Ceylon, the whole of Madura the islands around that (?), also in Coromandel, but that of Manaar are the best of all. The roots alone of this small plant, as well the roots of health are not unlike, are used, the same cost at times 50 pagodas per bahar of 450 ponds”.35

“The second red is made of the runas, also named mandosti and choli (tsjoli), coming from Persia and Arabia, the best sells for 60 to 70 pagodas per bahar of 480 ponds”.36

“The third red is made of the wood, named sappan, being a kind of Brazilian wood”.37

34. Ibid.
35. Ibid., p.205.
36. Ibid.
37. Ibid.
"The fourth is made of the bark of a tree, called pattashaya. Also caliatour wood gives a red colour, but these and other more good (colours) in order to vitiate or defraud the people, also the pattachaya of inferior quality is still more expensive".\textsuperscript{38}

It is clear from the above description of the hierarchy of red colours and their prices that chay was preferred owing to its superior quality, coupled with its comparatively lower price.

Van Rheede provides information on the preparation of red colour. He writes, "The first two roots were pounded finely, woody stems are obtained from that, (are) placed in water, (than) set on fire, (it) is made so hot, (that) hand could not endure, is allowed to cook and (then) the cloth that one desires to be coloured, are put therein, as the same are prepared for that purpose, otherwise that will not accept any colour or retain it. And because one of these two are used, shall I take only chay-root, it being strange to observe, that they put a white cloth in the dye vat, and the same is drawn out again, worked through with beautiful red flowers, and foliage or tendrils, and the rest pure white. When it is washed it holds firm, that is, the colour will never come out."\textsuperscript{39}

Van Rheede describes the tools used in painting thus: "The instruments, with which they work, are very few, consisting of two pencils or rather writing pens, one for the wax and the other for water colours;
... the rest small or big jars, containing hair or wool (for the brush). The pen, with which they paint or mark, is of iron, a span (i.e. nine inches) long, so thick as a writing pen. Below the middle it is divided into two-and-two-finger breadths or a little wider those split parts bent out in half circle, running below that round again parallel to the others, such as some compasses are made, in order to enable (lower part of the pen) to the open and close. The middle of these iron pens were entwined with human hair, the shape obtaining like a chicken, and also so big, muffled around with a cotton thread, in the manner of a ball of rope-yarns. In the even similar manner is the pen prepared for using water colours, that it is taken out from a piece of bamboo, split like a pen, and is cut sharp. They hold these pens in the full fist, the writing end under the hand, making in the movements a firm stroke, and so skilful (that) it is a wonder to see them working. As it happens, they sit in transverse manner, numbering seven or eight, in a round circle, the wide flat vat is filled with molten wax up to the middle, placed on a small fire. The heat is to remain always such that they may reach the entire vat with their right hand to fill their pens with wax. It is held up in hari and by pressure of the hand comes down to the tip (punt) of the pen and writes on the cloth in such a manner, as we can do with a pen. Each has a footstool for himself, sitting on the ground, upon benches their cloth is placed like a table. And they do so, when they work with watercolours, but they are bound to sit in a circle because each one has a small pot or potsherd, to
have his colour by himself. When they wish to paint a cloth of some interest, they do it with their tops, and such hair that falls in, to make patterns thereto. They sponge their cloth with charcoal, with which the prints or forms are printed usually in Europe, but here all happens with the pen. And when in Holland one finds a stain or soiled mark in the painted cloth (from India) it must have happened by the incapability or lack of care of the painter, they have tripped up or hit at the place with their pen where it was not intended”.40

Next Van Rheede discusses the drawing over the charcoal traced outlines with a kind of pen dipped in mordants:

“In order to paint a white cloth, wherein red, blue, purple, green, black or yellow flowers are to appear, I have seen the work being done in the following manner. The cloth, being prepared with milk in the above mentioned manner, four flowers are drawn with water from the head of the pen made of bamboo or of reed. Looking like watery churned milk, with which the lines are marked, the colour changes into brown-red, and after a few moments thereafter, into pitch black. This ink is made of burnt smithscoal (i.e. fine coal, obviously charcoal) with vinegar of low quality rice, or the wine from the coconut trees, called suri, there is put in also a piece of iron, which however one used it on paper or common cloth, yields almost no black (colour). And this ink, is called kalikan here, all the black chintzes and grounds of cloths are made by it, the

40. Ibid., pp.207-208.
cloth, as one sees in Europe, can bear washing. After outlining the flowers with this ink, the leaves are outlined, the red should be painted with the sap of red sappan wood, grated, cooked and mixed with alum, added in such a manner, that the flower must be deep red. There they bring cloth covered entirely, or arsenised, this red colour, in itself is not durable. This being done, this cloth is put in the pot. Wherein the chay root, was prepared and was heated on a small fire. The cloth is hauled up and down many times, and is plunged incessantly in the water, Allowed to remain in it for three hours, and (then) taken out from that, washed, dried and put in the myrobalan water without milk; it once again is dried before being put into the bigger dye-vat and, like the first time, is allowed to remain there 2 to 3 hours there. When this comes out from there, many things still remain to be done. After being cleaned up with goat’s or sheep’s dung and water, the cloth is put on the ground, is spread out in the sun. It is washed in fresh clean water, continuously for three hours, this being a manner of bleaching. And this happens in the same manner twice, one after the other, which done, the cloth is washed, the white appears cleaner and the red fine, to wit, the red of the pot or the chay is favoured. At (those) places where the flowers were wetted with alum, a pale and pleasant red, and at places where sappanwood was painted, darker red like a shadow, making in this way a complete red flower upon a white ground, the other flowers being not different from the figure outlined in black”.

41. Ibid., p.208.
After describing the method of obtaining red flowers, Van Rheede discusses the process of painting blue flowers with green leaves. He writes, “Now about to make a blue flower and green leaves, the whole cloth is covered or painted with hot wax, in the manner narrated earlier, those parts were taken out, to be dyed in blue, the cloth is steeped three or four times in and out entirely in the tub of blue dye, (then) washed off in cold water and is dried in the sun. After that it is put in and out of hot water, then stretched out, washed and dried, again for the third time washed with myrabolans and dried, in order to give other colours. (The parts which are to be green, are run with water of curcuma (corkema), called manjela here, and are yellow, also with the flowers’ of carika, along with little alum over the blue, which then would be green, but is unstable. Thereafter the purple flower is made, for which a brownish red dye is made from one part alum water, sixty parts common water, a small lump of pulverized korckuma, so big as a hazelnut, and one part sappanwood water, half of all; besides half sappanwood and fourteen parts vinegar of cooked coarse rice, everything are mixed together. The flower which should be extreme purple, is made with one part of the black ink, thirtieth part vinegar of canji and 10 to 12 drops of sappanwood dye, (they are) mixed together, all of which is done before being put in the dye-vat for the last time for half an hour. Washed clean and dried, the cotton cloth is snow-white ready with light and brownish red, blue, purple Columbine (i.e. dark red and blue) flowers, with green leaves and black ribs.”

42. Ibid.
long description is followed by a reference to the process through which fast colours could be obtained. Van Rheede writes. “Since all these water-colours, none of them are lasting, the cloth is now put in the general dye vat of chay root, because that gives permanence to the other, and itself being of a clear red colour. And in addition to this, all the painted cloths and chintzes are made, (and) reach Europe from Coromanded”.43

The next important part of Van Rheede’s report is concerned with experiments to paint silk cloths. He writes, “I have always wondered about the beautiful colours, that are given to the cloth upon white grounds, and had thought many times why it could not be brought on silk stuffs, as in Japan, where it gets unquestionable forms and flowers”.44 Van Rheede says that he had tried in Bengal, Baticaloa (Ceylon) and Nagapattinam. His efforts were, however, doomed to disappointment: “However in several manners in the manner of cotton cloths, have been proved, one could not attach the colour of chay root upon silk. Because as the silk and a cotton cloth, prepared in the same manner, is put in the dye-vat and taken out at the same time, the cotton was of a beautiful red colour and the silk soiled and dirty. Nowhere it resembled the former, having not only no colour, but also having lost the shine of silk.”45

43. Ibid.

44. Ibid.

45. Ibid.
Block printing is a process of reproduction of the desired or conceived designs or images on textiles from a reverse or negative image. It involved, says Needham, three essential elements: (a) a flat surface, originally cut in relief, having a mirror image of whatever is to be printed; (b) the preparation of the mirror image; and (c) the transfer of the impression of the desired design on the surface of the cloth. In brief, the pre-history of printing required familiarity with the process of reprography. This was preceded by (a) seals for stamping on clay ware and lac which being a soft materials took concave rather than convex stamps; (b) art of carvings on stone and metal which helped in taking of inked impressions and (c) use of stencils to duplicate designs on textiles and paper.¹ All these processes paved the way for the use of woodblock printing which with concave stamps later resulted in the development of printing from moveable types.² Needham has suggested that there was a close relationship between printing of textiles and paper. Both were manufactured from the same kinds of materials in the initial stages of their production. They had a similarity of physical forms and properties. Even their uses were interchangeable.³ Both required concave, not convex

². Ibid.
³. Ibid., pp.36-37.
stamps, and thus represented a radical departure from other kinds of stamps. Needham could find the earliest specimens of printed textiles in the discovery of silk fabrics at Ma-Wang-Tui, Chhangsha in China indicating printing on textiles of a set of continuous patterns dating back to as early as the second century AD. Wood-block printing on paper had started in China by 556 AD. But block printing on cloth has only been firmly dated in China from seventeenth century onwards. The earliest known example of block printed textiles in India comes from an Egyptian archaeological site. It possibly dates back to the tenth-eleventh century. The diffusion of block printing from China to India possibly took place through Central Asian route. Chinese textile technologists, paper makers and goldsmiths and painters were stationed at Samarqand and Kufah in the eight century AD. There were large number of settlements of Chinese artisans and craftsmen between Samarqand and the valley of Upper Yenisei in the north. Such settlements of Chinese


5. Ibid, p.132.

6. Ibid.


9. Ibid.
artisans in Central Asian territories and their proximity to India might have been instrumental in transmitting the technology of block-printing on textiles to India from China sometime between tenth-eleventh century AD. There is also the possibility that block-printing of cloth derived mainly from paper seal-stamps.

Archaeologists have tended to assume a very early date for cloth printing in India from their discoveries of clay stamps. A.K. Coomaraswamy found an earthenware block anterior to 5th century A.D. John Marshall dated ‘earthenware stamps for stamping of textiles’ to the Saka-Parthian period. R.C. Gaur took a terracota mould of Atranjikhera for a printing block, this was found in N.B.P. levels, datable to 5th-4th century B.C. Marshall reported a circular stamp of terracotta showing a floral pattern of first century A.D. from Taxila. He also reported about “stamps for stamping pottery, textiles etc.” from the second and the third strata of Sirkap. He found the patterns simple, geometric and scrolls and suggested that they were perhaps used for “stamping textiles”.

14. Ibid.
The identification of these clay moulds as printing blocks, however, remains dubious. First of all there seems to be an apparent lack of consideration of the force which pressing on a firm surface would impose on 'baked clay'. No earthenware stamps are otherwise known to have been in use for cloth printing in India, for Roques in his account of 17th century cloth printing in India refers only to wooden blocks.\(^\text{15}\) The individual specimens also make identification impossible. Thus, the Atranjikhera 'printing block' is not a stamp, but a mould, that is, it has a pattern inside of it which can only be impressed on plastic material. In other words, these stamps are concave and would be useless for printing cloth. Indeed, Gaur does not admit the possibility of the specimen being intended to impress "decorations over ...... mud plasters of house walls",\(^\text{16}\) though surprisingly he does not take the reader into confidence about the internal mould like cavities of the stamp. The Taxila 'blocks' need to be examined similarly before one can pronounce on even the possibility of their use in printing.

R.J. Forbes considers block-printing to be of ancient origin in India.\(^\text{17}\) But he does not cite any evidence in support of his postulation.


\(^{16}\) R.C. Gaur, p.277.

\(^{17}\) Forbes, IV, pp.138-9; Hans. E. Wulff, p.224, following Forbes commits similar error.
There is, however, a controversial sentence in Banabhatta's *Harshacarita*, which reads "kutila krama rupa kriya-mana pallava prabhagair"\(^{18}\)

P.V. Kane explains it as follows "On the dyed and dried cloth, some paintings of the various trees were being drawn. The paintings had very great beauty (prabhag). The paintings were being drawn on the inside of the cloth and hence they were done in the reverse order of nature (kutila-krama), so that the outside (that would be visible to others) would show the beautiful 'pallava' in their natural forms."\(^{19}\) So explained the text does not justify an assumption of block-printing, for with printing there is no need at all for any drawing or painting on the inside of the cloth. Nevertheless, Kane himself had reservation about his translation of the passage.\(^{20}\) V.S. Agrawala interprets it differently and says that the first two words (kutila krama) signify an undulating pattern. "They could also refer to a diagonal arrangement, with ornamental rows extending from one corner to the opposite, such as we find depicted on a costume in one of the Ajanta murals".\(^{21}\) The next word has had, from the time of Panini, the technical meaning in the sense of 'symbol', 'design', 'figure' and V.S. Agrawala considers it to be the same here. He refers to Panini's

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19. Ibid, pp.54-55.

20. Ibid.

words ‘rupad ahataprasamsayor-yap’, where the word rupa is clearly used for stamping symbols on metallic pieces.\textsuperscript{22} On the strength of this allusion to stamping, V.S. Agrawala, therefore, considers that block-printing was known during Harsha’s time.\textsuperscript{23} However, V.S. Agrawala’s argument does not conform to the general description given in the text. The text specifically refers to tie and dye technique and at most cotton painting. It refers to a term called bhakti-chchheda i.e. stencils with designs (used for painting the body of an elephant).\textsuperscript{24} He argues that the origin of the later term bhant used in Rajasthani, Gujarat and Hindi lies in the use of the Sankrit term bhakti which meant ‘pattern’.\textsuperscript{25} At Patan in Gujarat the term bhat was used for the patterns obtained through patola weaving till very late.\textsuperscript{26} So far as the interpretation of the term ‘rupa’ is concerned it did not necessarily mean or even obliquely suggest any appliance for printing a design on cloth. The term kutila-krama referred, as we have seen, to an undulating pattern. V.S. Agrawala was of the opinion that it could also refer to a diagonal arrangement, with ornamental

\textsuperscript{22} V.S. Agrawala, \textit{India as known to Panini}, Lucknow, 1953, p.272.


\textsuperscript{24} V.S. Agrawala, \textit{Harshacharita — ek Samskritik Adhyayana}, pp.74-75.

\textsuperscript{25} V.S. Agrawala, “References to Textiles in Bana’s Harshacharita”, p.66.

rows extending from one corner to the opposite which he finds represented in the *hamsa* motives arranged in curved and diagonal rows. Such an arrangement was not an exclusive characteristic of cloth printing. They could be procured equally easily in painted cloths. Secondly, the size of the ducks are too big to be printed. V.S. Agrawala had himself later dissociated himself from interpreting these *hamsa* patterns as printed ones. He asserted very clearly that they were in fact painted by painters.27

Whatever the interpretation of Bana's text, it remains possible that block-printing was being practiced in India by the tenth-eleventh century A.D.28 Kalhana (1148-1149 A.D.) mentions a kind cloth called *Yamusadeva* stamped with an image of the sun (*Patam Yamusdevakhyam martandpratima amkitam*) which was brought away by king Mihirakula from Ceylon.29 The term *amkitam* has been translated as 'stamped' by Sir Aurel Stein.30 It can, however, also mean 'marked'.31

There is a reference to an 'instrument' (*yantraka*) in a 12th century work *Manasollasa*, with reference to dyeing which induces Vijaya

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30. Ibid., p.44.

Ramaswamy to argue in favour of the existence of cloth-printing in South India in the 12th century. However, the *Manasollasa* merely refers to the “material coloured by an artisan”. The term *Yantraka* does not necessarily mean ‘a tool’. It could also mean ‘an artisan’. Moreover, the patterns described in preceding and subsequent passages do not warrant the use of printing block proper. Moti Chandra finds the word *uncho* for the profession of calico-printer (*chimpakarakaruvisesah*) in *Paiyalacchi* of Dhanapala, a 12th century lexicon of indigenous words. In the same work, Moti Chandra finds the words *chimpa* or *chimpao* for calico-printer, from which modern *chipa* and *chipi* have originated. In another interesting reference we hear from Abdur Rahman (1170-1213) about a particular kind of miscellaneously painted/(possibly) printed (*chitra vichitra*) cloth. Saint Namdeva (1270-1350) refers to

32. Vijaya Ramaswamy, p.455.


37. Ibid.

himself as cloth printer and also held his caste of *chhipa* (block-printer) responsible for his ejection from the temple.\textsuperscript{39} Abdullah Wassaf (1300) refers to stamped cloth brought from Cambay by Muizzuddin, brother of Sultan Alauddin.\textsuperscript{40} Printed cloth of 13\textsuperscript{th} century have been reported from Egypt by Ruth Barnes.\textsuperscript{41} Maulana Daud (1370) refers to a cloth called *chhinpar netra* (i.e. printed *netra*).\textsuperscript{42} In *Futuhat-i-Firuzshahi*, the term *chattah* has been used in the context of abolition of certain taxes by Firuz Tughlaq.\textsuperscript{43} S.A. Rashid takes it as some kind of municipal tax on a balcony. But Quraishi identifies it as *chapa* and describes it as a


\textsuperscript{40} Abdullah Wassaf, *Tazjiyatul Amsar wa Tajriyatul Asar*, tr./ eds., H.M.E. Elliot and J. Dowson, *The History of India as told by its own Historians*, III, 1st pub. 1867-77, rep., Delhi, 1990, p.43.

\textsuperscript{41} Ruth Barnes, pp.573-74; see also Jenny Balfour-Paul, *Indigo and the Arab World*, Surrey, 1997, pp.125, 228n. 74. Balfour-Paul suggests that some of these fragments including indigo dyed ones could have been of local origin since techniques of printing on cotton, including discharge printing using wooden blocks, existed in Egypt and Syria at that time. But resist-printed indigo-dyed fragments, mostly of Indian origin, have also been excavated at other sites in Egypt and the Red Sea port of Quseir al Qadim, which date back to the thirteenth and the end of fourteenth centuries.


tax on printed cloth.\textsuperscript{44} Furthermore, Moti Chandra finds the word *chimpaka* for a female calico printer and *chipa* calico-printer in 14\textsuperscript{th} and 15\textsuperscript{th} century sources respectively.\textsuperscript{45} Srivara (1459-1486) gives credit to Zainul Abidin, the ruler of Kashmir for introducing printing on silk.\textsuperscript{46} Jaisi (16\textsuperscript{th} century) refers to the word *chapa*.\textsuperscript{47} By the end of the 16\textsuperscript{th} century we hear of the term *chimpaya* (calico printers) in a commentary on the Jaina text *Jambuddvapannati*.\textsuperscript{48} Arif Qandahari’s observations about Akbar’s interest in textile technology reflect his keenness in introducing new elements into it. He observed, that besides introducing [lit. inventing] new kinds of silken cloth, brocade, tapestry and carpets of silk and brocade in India which compared favourably with the works of Persia and Europe, Akbar had taken keen interest in “the making of designs (*tarrahi*) that if Mani [the great artist] was alive, he would bite his fingers in astonishment at such design-making and dyeing”.\textsuperscript{49} Like

\textsuperscript{44} \textit{Futuhat-i-Firuz Shahi}, tr. M. Omar, Aligarh, 1957, pp.31-32.

\textsuperscript{45} Moti Chandra, pp. 147, 168.

\textsuperscript{46} Kashinath Dhar, tr./ed., \textit{Srivara’s Zaina Rajatarangini}, Delhi, 1994, p.238.

\textsuperscript{47} Moti Chandra, p.179.


Arif Qandahari, Abul Fazl also refers to the term *tarh-ha* (designs). It has rightly been suggested that these terms refer to the designs on the printed block for printed chintz. It has been pointed out that Ghani Beg Asadabadi had made efforts “so much in the art of design-making (*tarrahi*) and inventing chintz-patterns (*ikhtira-‘i chit*), that those who were experts in that art admired and imitated him.” Similarly around the same time, Aqa Muhammad Shirazi “made strange, wonderful inventions, and achieved much success in making designs for chintz (*tarrahi-i chit*), which they make best in Sironj in all of India”. The Iranian background of these two master craftsmen in the service of Abdur Rahim, while these do not itself suggest the import of the technique from Iran, these possibly suggests a tendency to transfer Persian designs in drawloom weave (which had also possibly made its entry into medieval Indian textile craft) over to printed chintz. This is not very material, since the author of *Maasir-i-Rahimi* (1616) extols certain persons for designs (*tarhi*) from *chhint* (chitz) made at Sironj (as noted above), which


53. Ibid., III, p.1659.

could only be designs for printing blocks. Sironj was a notable centre of chintz (printed-cloth) manufacture. Thevenot (1666) speaks of printing blocks used for obtaining direct colour impression on cloth in Agra. Thevenot writing of the apparels used by the inhabitants of Agra, says, “When it is coled Weather, the Indians wear over their Shirt an Arcaluck or Just au corps quilted with Cotton and Pinked, outside whereof is commonly of a schite (chhit) or painted stuff. The colours upon then are so good and lively, that they be soiled wearing, yet they look as fresh again as at first when they are washed. They make the Flowers and other motley colours that are upon the Stuffs with Moulds” (emphasis added). The use of the word chit (Hindi – chhint for calico-printed in Isfahan) establishes India’s primacy in cloth printing. Tahir Wahid, a 17th century poet, who never visited India, says, “My lifeless body gets life from the chit makers by being used as a printer’s block”. Qalib, the appropriate Persian word for block-printing was also in currency, for Tahir Wahid, praising the ‘chintz-makers’ of Shiraz says, “One cannot

56. Ibid.
57. Thevenot, p.51.
58. Ibid.
59. *Bahar-i-Ajam*, s.v. chitsaz chitgar.
60. Ibid.
pass him by casually, for in his printer’s block (qalib) is the soul of a fairy”.61 In the Bahar-i-Ajam, the term chhapa is considered to be a Hindi word for the printing block, said to have been adopted ‘recently’ as chapa in Persian.62 The use of a particular component of the dye employed in cloth printing is also referred to. It was gulkama, a sediment left after the extraction of rose water, and which, says Bahar-i-Ajam, was used for printing cloth.63 The use of the Indian words chhap and chhint establish the dominance of India in cloth-printing 17th century. By 1667, Tavernier reported the decline of calico-painting, whereas calico was printed in large quantities for home as well as foreign markets (including Persia).64

A Frenchman George Roques wrote in 1678 a detailed report on cloth printing in Ahmadabad. He says that the printer distinguished outlines by the lines and hollow of the first block. After it, another block was used of the same size and pattern. But in place of the raised outlines of the first block, it had a hollow structure. Its voids went directly on the imprint of the first. The remainder of the second block was without engraving to facilitate filling the ground with the desired colour. When the ground was dry, blocks with details of the design were applied in

61. Ibid., s.v. qalib.

62. Ibid., s.v. chapa, Qalib is the appropriate Persian word.

63. Bahar-i-Ajam, s.v. gulkama.

64. Tavernier, II,p.4.
between the black outlines of the first block. After these impressions were dry, another block with 'rays' (radiating lines?) was used, which gave shading to the flower by little lines. These were ordinarily of the colour of indigo.\textsuperscript{65}

The author of an anonymous article (1752) refers only to 'encreaux' engraving while describing Indian methods. He refers to two methods, the use of a printer’s block of the width of the cloth. He says that cloth was soaked in an Arabic gum solution.\textsuperscript{66} It was most probably done to prevent the running of colours. This large block, corresponding to the width of the cloth, would have been a tiresome and inaccurate job owing to weight of the block, more so when the cloth was seemingly stretched between rollers, without any base underneath.

In the second process, a wooden frame was filled with very pure clay, "free of all stones and grit and well kneaded". On this clay, the desired patterns were drawn. This drawing was then filled with colours prepared with spike oil. Great care was taken to avoid the spilling of the colours over the hollows of the drawing and the surface of the block was saved from colours.

Then, the cloth was fixed to the frame with nails along all the selvedge edges and it was tightly stretched. This cloth was watered with

\textsuperscript{65.} Roques, pp.7-8.

\textsuperscript{66.} Quoted in P.R. Schwartz, “French Documents on Indian Cotton Painting”, pp.39-40.
a solution in which gum Arabic had been dissolved. This operation was done in the open. Sun dried the cloth and removed the moisture from the colours. This moisture was too thick to pass through the gummed cloth and evaporate. Therefore, it used to get fixed to the inner surface of the cloth and the patterns were drawn.\textsuperscript{67}

Indian cloth-printing involved a complex manipulation of mordants and resists, which makes it distinct from the Chinese inked stamps of the (fourteenth century), and Europe's fixation of colours with blocks in the fifteenth century.\textsuperscript{68} Iran possibly received Indian cloth-printing in the sixteenth-seventeenth centuries, when Thevenot (1652) refers to cloth-printing in Isfahan. The practice survives in its original form in recent times.\textsuperscript{69}

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\textsuperscript{67} Quoted in P.R. Schwartz, "French Documents on Indian Cotton Painting", pp.41-42.
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\textsuperscript{68} For a detailed discussion see Irfan Habib, "Changes in Technology in Medieval India", \textit{Studies in History}, II(1), 1980, p.31; see also, Irfan Habib, "Medieval Technology: Exchanges between India and the Islamic World", p.219.
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\begin{flushright}
\textsuperscript{69} Ibid.
\end{flushright}
8. EMBROIDERY

Embroidery was practised for ornamenting the cloth in medieval India. It has been suggested that embroidery was known to Indians since the Vedic age. They might have been embroideries, but in the absence of any evidence of the technique employed, this question must be left open, as it is likewise not possible to say whether India originally had tapestry or pattern weave.

Vijaya Ramaswamy has tried to identify the word Sadisarakkudam in the 16th Century with the Persian word ‘Karchob’. But she does not take the reader into confidence about the proper meaning of the word, and she has elsewhere argued in favour of existence and practice of drawloom on the basis of the same word.

Unfortunately, we cannot reconstruct the earliest tool or practice of embroidery on such analogies, or by etymological speculations. We must hope for further reference of actual tool used.

1. Moti Chandra, p.8, identifies, a clock adorned with gold (hiranyan atkan) as a work of embroidery. But he himself cast doubt about it by writing elsewhere of ‘interwoven or embroidered’ cloth Ibid., p.9 for late in 9th century A.D. in ancient India, he refers to a lower garment (uccanda) which was shot with gold thread (kanaka grabhita) (Ibid., p.105).

The first sample of actual embroidery with strong Chinese influence in design as well as technique has been traced, belongs to the Seljuk period (1037-1157 A.D.) in Iran. In India the first reference to the embroiderer’s wooden frame, kar-chob, is not very old. Sujan Rai Bhandari (c. 1695) writes of the craftsman of Agra that they “......are unique in their embroidery of gold and silver, using the kar-chob upon chira and other fabrics......” This is the earliest example I have found of the use of the word kar-chob for the embroiderer’s instrument. Indeed, the word kar-chob initially stood for the harness for lifting warp threads in the loom. The author of Bahar-i-Ajam (c. 1740) specifically mentions that the word was Persian but older writers had not used the word in the sense of the embroiderer’s frame. Bahar-i Ajam goes on to add that “in it the garment is tightned in between the two wooden sticks”. From this Irfan Habib’s inference that it was a recent introduction or innovation seems to be correct for the dictionary does not give the Hindi equivalent which in any case seems to be non-existent.

Gold and silver wire embroidery done on embroiderer’s wooden frame consisted chiefly of two forms, viz., zardozi and kamdani. Zardozi

5. Bahar-i-Ajam, s.v. kar-chob.
is worked on velvet or satin with usually a heavy cotton lining to give support to the gold work. Gold wire embroidery is almost of necessity a ‘laid’ or ‘couched’ work. ‘Laid’ or ‘couched’ embroidery includes the forms in which the ornamenting material is laid on the surface of the textile and held in position by small stitches, usually brought from the back by a special needle for the purpose. In ‘couching’ embroidery, the ornamental material is upheld by some padding placed beneath for that purpose. Presumably the references to zardozi may imply either of these two embroideries.

Apart from the embroiderer’s frame, there is explicit description of the use of needles in embroidery. The author of Bahar-i-Ajam quotes Saifi saying, “The moon which is embroidered with gold was stitching the heart with the arrow of sight (he or she) was finishing (ba-sar) stitching the forlorn heart with a needle of gold”.7

Medieval Indian embroiderers often used pure gold and silver threads as well in embroidery. As late as the 17th century, Indians did not know the art of gilding. Tavernier (1667) commenting on this deficiency says, “The Indians not knowing the art of gilding silver, insert in their striped stuffs threads of pure gold, on this account it is necessary to count the number of threads to see if the stuff contains the requisite quantity, and the same should be done in the case of stuffs striped with

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7. Bahar-i-Ajam, s.v. zardozi.
silver....."8 It could be quite safely assumed that technically speaking, beaten, drawn and rolled gold and silver wires were used in embroidery. The art of gilding came later in the 19th century.9

The Bahar-i-Ajam refers to guldaz as "cloth in which flower are stitched (i.e. embroidered)".10 Since it required 'flowering work', it possibly refers to what is called phulkari in Hindi, done by darn stitch, entirely from the back.11

The Bahar-i Ajam refers to yet another embroidery technique, kashida, "In Khurasan, this is embroidery which a woman stitches on cloth and in India, it is called shai (spreading)".12 In this, pattern is drawn over the surface of the cloth. The needle work was done in muga silk of an old gold colour. Kashida embroiderers worked entirely in darn stitch.13

The Bahar-i-Ajam also describes the well known chikan. It says, "It is also called chikin, it is a kind of embroidery, and the cloth on which chikan is embroidered, is called chikan-dozi and the person who

8. Tavernier, II, p.22.


10. Bahar-i-Ajam, s.v. guldaz.


12. Bahar-i-Ajam, s.v. kashida.

13. Indian Art at Delhi, p.385.
embroiders on the cloth is called chikan-doiz." The ordinary satin stitch, combined with a form of button-holing, was its most frequent form. Iran had received this art from China sometime during 11th-12th century A.D. Most probably it too came to India from Iran at a subsequent point in time.

Figures were embossed upon cloth with an iron-tool in 17th-18th centuries. The Bahar-i-Ajam explains the word uttu as follows. "This is famous embellishment (araiyish) which is done on clothes." It adds that the author had it authoritatively confirmed that "it is a hand-tool (dast-afzari) through which embellishment is performed". The Bahar-i-Ajam explains the technique through two poetic quotations. Mirza Tahir Wahid says, "Do not tell about the torture of the beloved who is like an embosser (uttu-kash), because he (or she) has put me in the fire like uttu". Through this process of heating the hand-tool (uttu) in fire, the flower design was embossed. Saifi says, "Do not keep (karam-bar) uttu

14. Bahar-i-Ajam, s.v. chikan, chikin
15. Indian Art at Delhi, p.398.
17. Bahar-i-Ajam, s.v. uttu
18. Ibid.
19. Ibid. s.v. uttu-kashidan
on your face, because its fire affects (embosses) the flower on your face."\textsuperscript{20}

Its importance diminished subsequently, and such embossed cloth did not find any representation in the exhibition of Indian art at Delhi in 1903.\textsuperscript{21} Zafarur Rehman Dehlavi regretted the waning of this art, for he could locate a solitary practitioner in Delhi.\textsuperscript{22}

\textsuperscript{20} Bahar-i-Ajam, s.v. uttu-kashidan.

\textsuperscript{21} Cf. Indian Art at Delhi.

\textsuperscript{22} Istillahat-i-Peshawaran, II, p.164 (s.v. uttu).
COMMERCIAL ORGANISATION AND TRADE
STUDIED REGIONALLY
The 17th century witnessed an interaction between the European merchant capital and the traditional Indian economy. This interaction had many aspects, but one of the most interesting is the organisation of local artisans to meet the European Companies’ demand for craft goods. We propose to examine here the effort of the Dutch East India Company (V.O.C) to mould the organisation of craft-production at Nagapattinum in the Coromandel to suit its requirements.

Nagapattinum was for centuries a prominent port of South India. The Dutch conquered the Nagapattinum fort from the Portuguese in 1658.\(^1\) To it, the Dutch subsequently added surrounding villages either by force or through lease from local rulers. Owing to their restrictive commercial policies a shift of trade from Nagapattinum to Nagore took place. The latter port handled substantial trade of the V.O.C. in textiles, rice and other products of the countryside.\(^2\)

Philippus Baldaeus who visited Nagapattinum as early as 1660, did not mention any of the commercial products of Nagapattinum.\(^3\)

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Perhaps it was because only the manufacture of coarse cotton piece goods was practised here. He also describes a severe famine at this port. D. Havart observed, “the trade or the purchase here (comprises coarse cotton cloth, not very fine, or painted/printed goods...” Among modern authorities H. Terpstra pointed out that Nagapattinum was economically not very important. It had turned out “to be a liability rather than asset”. By 1661 the Dutch had secured from the Nayak a very advantageous kaul. The income from ten villages was granted to the Dutch. They were exempted from the payment of half the usual toll and were permitted to mint pagodas on payment of only 50% of the usual duties. In 1662 the Nayak’s representative made an abortive attempt to realise full tolls from the Dutch, but the Company chose to extract a written agreement from the Nayak to abide by his earlier kaul. Nagapattinum witnessed its worst famine in 1662-63. The weavers fled from the area; but this, it seems, was a temporary phenomenon for by 1664, some 100 families of weavers and painters/printers had returned to Nagapattinum and the neighbouring villages, at the instance of the Dutch.

4. Ibid., p.155.
7. Tapan Raychaudhuri, pp.64-65.
8. Ibid., pp.64-65.
9. Ibid.
Upon the return of these artisans, fresh contracts were concluded between painters/ printers and weavers, on the one hand, and the V.O.C. governor Cornelis Speelman, on the other. For convenience we will designate them as “Set =A” documents. These documents can be supplemented by a contemporary memoir prepared by Cornelis Speelman for the chief and the Council at Nagapattinum. Notwithstanding the relatively small number of these documents, they throw much light on the putting-out system in operation. Moreland’s assumptions that the putting out system prevalent in India “resembled in essentials that which prevailed in Europe at the period” and his suggestion that “the advent of Dutch and English buyers was beneficial” need to be checked in the light of these documents. However a detailed description of the similarities and dissimilarities is beyond the scope of the present paper. Under the

10. See Appendix-B.


broadly accepted form of putting out system, the finishing of the cloth after it was woven was done by the merchant, not the weaver.\textsuperscript{14} So there are numerous references to engaging of a group of painters/printers and weavers. This practice continued till the end of the 17th century. The processes of dyeing, decorating and washing are also presumed to have been carried out under the superintendence of the merchant.\textsuperscript{15} However, our present set of documents do not agree with these postulations in totality. The major difference lies in the fact that cash advances were taken directly from the Company’s officials by the artisans to provide finished products. We will try to identify various aspects of putting out system in the light of our documents.

Let us first take up the “Set=A” contract documents. These are not chronologically arranged in the collection of the V.O.C. archives, K.A. 1145 (1666 IV), ff. 553-562. Some crucial details of these documents are provided in the Appendix-B. These documents are translations of contracts from the native ‘Malabar’s (obviously Tamil) language. The first contract was made on 17th april 1665 between Cornelis Speelman and 17 painters/printers of Nagapattinum and 3 of Nagore. This document

\textsuperscript{14} J. J. Brennig, pp.269-271.

\textsuperscript{15} Ibid.
says that it was a translation from the *barga(?)* language. The native artisans professed to make a contract “out of their free will (uijt vrijen wille)” with governor Cornelis Speelman, so that they might paint/print (schilderen) all kinds of cloth which were contracted (aanbesteet) out to them by the merchants of the Company, and refrain from painting/printing any cloth for anybody without his orders. Further, all the cloths which they might paint/print for others should be confiscated (verbeurt) but this was to be on the understanding that they also should get all the works of the Company on contract.\(^{16}\) In return they promised to supply good quality (deugdzaem) cloth, good chay (dye) and decently painted/printed cloth.\(^{17}\) In case some bad quality cloth were supplied in return for the advance (ujitschieten) it was to be brought and shown to the Dutch chief of Nagapattinum. He would first select according to the quality of the cloths, else would be sold elsewhere outside. It was laid down that if 3 or 4 small holes (gaaties) or darns (stopjen) were found in one packet, it would be taken back by the painters/printers and would be replaced by good supplies. but in case more were found, all would be seized by the Company.\(^{18}\) They would along with their whole group/party (gezelschap) contract collectively for cloths of merchants of the Company and would also remain each others security for the money which was

\(^{16}\) K.A. 1145 (1666 IV), f.556.

\(^{17}\) K.A. 1145 (1666 IV), f.556.

\(^{18}\) K.A. 1145 (1666 IV), f.556.
advanced to them by the Company."\(^{19}\)

Next in the "Set =A" documents are those contacts which were signed on 24 April 1665. They comprise two contracts. Of these two, one was signed by 17 painters/printers of Trimelepatnam.\(^{20}\) The clauses of this contract were broadly in agreement with that of 17th April 1665. However, the second one (3rd in the Appendix) was signed by as many as 61 painters or printers of Tammelepatnam.\(^{21}\)

The fourth contract was signed with 13 weavers of Porwechery, one of the eight villages of the Company, on 27th April 1665. This was different from others in that it did not concern painters/printers. The weavers had collectively taken the work from the Company and had divided the work among themselves. They received the money before hand.\(^{22}\)

The fifth contract was concluded with 11 weavers of Mansiecoule. The clauses of the contract were same as above.\(^{23}\) The sixth contract was signed with the weavers of Nagapattinum on 4th May 1665. It was signed by three weavers.\(^{24}\) The seventh contract was signed with two weavers of

\(^{19}\) K.A. 1145 (1666 IV), f.557.

\(^{20}\) K.A. 1145 (1666 IV), f.553.

\(^{21}\) K.A. 1145 (1666 IV), f.553-554.

\(^{22}\) K.A. 1145 (1666 IV), f.557-558.

\(^{23}\) K.A. 1145 (1666 IV), f.559.

\(^{24}\) K.A. 1145 (1666 IV), f.560.
Trimelepatnam on 4th May 1665. It specifically mentions the caste of the weavers as Kaikola (Kaiykula).\textsuperscript{25} The eight contract was signed with ten weavers of Trimelepatnam. Their caste has been mentioned as \textit{kasta scluenea(?)}\textsuperscript{26}

Apart from references to two major occupational classes, namely weavers and painters/printers, these contracts are not very helpful in indicating the implicit interest rates, wages or nature of payment. They do not specify the kinds of cloths they were expected to produce. But it is obvious from these documents that the V.O.C. attempted to organise the procurement of textiles through contracts with groups (gezelschap) of artisans instead of individual artisans. Unlike other port towns, we do not hear of any big merchant operating at Nagapattinum. Perhaps the V.O.C. took advantage of this situation and tried to organise production on the basis of such group contracts. Such arrangements would be more effective in subjecting the greater number of artisans to Dutch control. The contracts involved various restrictions imposed on members of a contracting group. For example the document signed on 17th April 1665 refers to a prior settlement of all disputes amongst the members of the group.\textsuperscript{27} It was laid down that in case of defiance, the offending member

\textsuperscript{25} K.A. 1145 (1666 IV), f.561.

\textsuperscript{26} K.A. 1145 (1666 IV), f.562.

\textsuperscript{27} K.A. 1145 (1666 IV), f.554-555.
would be ostracised from the group. In case of continuance of quarrel among members, their houses and goods were to be confiscated by the Company. And if somebody desired to discontinue work, without fulfilling the contract, he would be banned from the Company’s service.

Of the sixtyone persons contracting with the Company, four persons alone were to be responsible for all the transactions between the Company and the particular group of artisans. It seems that initially these conditions contributed positively in favour of the V.O.C.’s monopoly status at Nagapattinum. Cornelis Speelman wrote in his memoir that these contracts with separate groups of artisans led to a regular flow of cloth to the Company. He refers to the supply of ramboetans, tapesarasse with flower work, baby cloths of tape sarasse, tape chindos, ballatios (smooth cotton cloths specially produced at Nagapattinum), black and white taffachelas, blue boelongs (head scarfs), brandams, tapeturias, sarassa gobar, salalous, dragon gobar, dragon tapy and chergien of Nagapattinum. These cloths were possibly not produced at Nagapattinum earlier. These were now exported to Pegu, Macassar, Japan and Batavia.

28. K.A. 1145 (1666 IV), f.554-555.
29. K.A. 1145 (1666 IV), f.554-555.
30. K.A. 1145 (1666 IV), f.554-555.
31. K.A. 1145 (1666 IV), f.554-555.
32. K.A. 1145 (1666 IV), f.521-522.
33. K.A. 1145 (1666 IV), f.522-525.
Speelman counselled the establishment of apprentices to weave cloths in the Company’s weaving villages. In order to ensure quality, Speelman suggested that inspectors of V.O.C. should visit the artisans when they put warps on the loom.34

What was the outcome of such efforts of the V.O.C.? It seems it produced good results at the initial stages. The Governor General at Batavia acknowledged such an outcome in his missive of 30th January 1666. He wrote that “more and more workmen had started flocking around the city of Nagapattinum and since March 1665 had already sent cloths worth f. 13,5085.”35 It seems, however, that this was a temporary gain. It continued to be an economic liability in the subsequent period.36

A casual glance at the names of the artisans in the Appendix-B makes it clear that the chettis were no longer merchants only.37 They were weavers, and painters or printers also. It has been suggested that chetti weavers and painters might have sprung from Tamil weaving caste.38 Our documents provide supporting evidence in this regard.

34. K.A. 1145 (1666 IV), f.529.
36. Tapan Raychaudhuri, p.65.
10. GUJARAT AND COROMANDEL IN TEXTILE EXPORT TRADE

The History of commercial exchange between India and Europe dates back to antiquity. As is well known the 17th century marked some outstanding changes in the structure and pattern of overseas trade of India when the two North European monopoly companies, the English East India Company, founded in 1600 and the Verenigde Oost Indische Compagnie (V.O.C.) founded in 1602, entered into Asiatic trade. Both of these Companies tried to compete with each other in their trade in Indian commodities. Of them, the V.O.C., the subject of our present discussion, was the first to attempt an entry into the textile markets in India at the end of the year 1601.¹ Later in 1606, they started a factory at Surat which was closed in 1607 with the suicide committed by its factor Van Deynsen.² For sometime they could not establish a factory on the Western Coast. The VOC could reopen its factory at Surat in 1617.³ On the eastern coast, the VOC had established a factory in 1605 at Masulipatnam. By 1610, factories were established at Petapuli, Tirupapaliyur, and Pulicat. Pulicat was made the chief factory of the region. Pulicat was recaptured by the Portuguese in 1612, but they had

2. Ibid., p.32.
3. Ibid., p.38.
to vacate it shortly. Thereafter, the trade and position of the V.O.C. stabilised in Gujarat and Coromandel, the two most important maritime provinces of India during 17th century.

An attempt has been made here to ascertain the relative position of Gujarat and Coromandel in V.O.C.'s trade, as rival exporters by comparing the quantities and composition of the goods ordered from these places and the observations provided in the Dutch records. We have restricted our analysis to major common commodities of these two regions. They are indigo (Appendix-C), cotton textiles Appendixes-D, E, F and G) and cotton yarn (Appendix-H). This study will help us in gleaning the course of development in the above mentioned items of export. The evidence of this nature can be of help in understanding the nature of change in the pattern of Indo-Dutch trade.

There is a vast quantity of material that lay unpublished in the repositories of Algemeen Rijksarchief (ARA), The Hague. Our present study is based on a series of records of the V.O.C. called Resolutien genomen op de ordinaris en extraordinaris vergaderingen van Heeren XVII (Resolutions adopted at the ordinary and extraordinary meetings of the Gentlemen XVII). These records contain valuable information about

4. Cf. H. Terpstra, De Vestiging van de Nederlanders an de Kust van Koromandel, pp.1-158; W.H. Moreland, From Akbar to Aurangzeb, pp.11-136; H. Terpstra, De Nederlanders in Voor Indie, pp.8-78; Tapan Raychaudhuri, Jan Company in Coromandel 1605-1690, pp.15-38. These provide along with statistical data some explanatory comments as well. I have offered a translation of some of these comments below.
the commodities ordered by the V.O.C. These mostly annual lists give
information about goods to be procured at various places and sent to the
Netherlands. These lists were sent to the Dutch governor generals and
the High Council located at Batavia. They in their turn used to send
these orders/demand lists to respective factories from where these good
were to be acquired. These lists specify the exact nature and quantity of
goods, their qualities and the regions from where these were to be
procured. They are of further help since they offer qualitative statements
as well about the items. Nevertheless these records have their own
limitations, it should be mentioned at the outset that these are only the
lists of commodities ordered and detailed data of the receipt of the ordered
items is not provided. Consequently, the comparisons are based only on
quantities ordered because the value of these goods are usually not stated.
Furthermore, the nature of the orders up till 1680 makes difficult to present
the available data in a tabular form. It is also not always possible to
determine the places of origin of these fabrics which were commonly
manufactured in both of these regions, as well as at other places
(Appendix-G). For example baftas were manufactured in both the regions
of our study. To get a region-wise break-down of cotton textiles ordered,

5. Glamann, p.135 considers it "impossible" to determine the origin of
the fabrics. However, it is not true in the case of all cloth and is
rendered very easy after 1630. Om Prakash, The Dutch East India
Company and the Economy of Bengal 1630-1720, p.264 observes
that the orders for the Bengal goods were included in the Coromandel
section till 1655 and hence was unable to trace it under a separate
heading until 1681.
is possible only after 1680 which facilitates a comparative analysis. However, the position is different in the case of other two items; namely indigo and cotton yarn. However, the most encouraging fact is that they are available in the continuous series except for 1637, 1654 and 1683.

Indigo occupied a fairly important place amongst the major common commodities exported from Surat and Coromandel. It remained a staple commodity of export through out the 17th century. To begin with, we may analyse the demand drawn up in 19 Nov. 1631, which is outstanding for its details and not only provides the quantities but also the estimated values of goods.

<table>
<thead>
<tr>
<th>Order sent in</th>
<th>Description</th>
<th>Estimated Purchase</th>
</tr>
</thead>
<tbody>
<tr>
<td>19 Nov. 1631</td>
<td>50,000 sacks</td>
<td>Pepper f. 375000</td>
</tr>
<tr>
<td></td>
<td>100,000 sockels</td>
<td>Mace f. 60000</td>
</tr>
<tr>
<td></td>
<td>400,000 lbs.</td>
<td>Nutmeg f. 20000</td>
</tr>
<tr>
<td></td>
<td>350,000 lbs.</td>
<td>Clove f. 105000</td>
</tr>
<tr>
<td></td>
<td>140,000 lbs.</td>
<td>Indigo Biana f. 130000</td>
</tr>
<tr>
<td></td>
<td>140,000 lbs.</td>
<td>Indigo Sarkhej f. 100000</td>
</tr>
<tr>
<td></td>
<td>100,000 lbs.</td>
<td>Saltpetre f. 10000</td>
</tr>
<tr>
<td></td>
<td>400 balen</td>
<td>Silk f. 320000</td>
</tr>
<tr>
<td></td>
<td>400 balen</td>
<td>Coarse guinees f. 38000</td>
</tr>
<tr>
<td></td>
<td>50 balen</td>
<td>Chinese silk f.35000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fine cotton cloth f. 25000</td>
</tr>
<tr>
<td></td>
<td>400 balen</td>
<td>Cotton yarn f. 30000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Porceleyn, Ginger,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chinese silk stuffs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>And other small things f. 35000</td>
</tr>
<tr>
<td></td>
<td>400,000 lb.</td>
<td>Sugar f. 25000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total f. 1308000</td>
</tr>
</tbody>
</table>

Source . V.O.C. 101, f.32 v.

It appears that in the total estimated cost of 130,000 lbs. Biana indigo accounts for 9.93% and Sarkhej indigo for 7.64% though the
quantities to be purchased were exactly the same i.e. 140,000 lbs., It was perhaps owing to the lower price of Sarkhej indigo in comparison to that of Biana.  

A comparison of orders for indigo in the 17th century gives a complex picture. Indigo from Sarkhej formed 62.5% of the total demand in 1633. But it was soon reduced to second position from which it could never recover in comparison to indigo from Biana. The figures are available for Coromandel from 1635 onwards. In 1635-36 Gujarat indigo remained ahead of Coromandel (33.33%). During 1638-1640 they vied with each other, their share being 23.57% each. From 1641 onwards a close rivalry followed. In 1641 indigo from Sarkhej had a share of 38.46% in comparison to Coromandel's 23.076% of the total order for that year. In 1642, Coromandel got an upperhand with a share amounting to 28.57%. Next year Gujarat was asked to send 31.25% in comparison to 27.08% ordered from Coromandel. During the period 1643 to 1646 the position of the two remained equal. From 1647 to 1670, Gujarat had an edge over Coromandel indigo as can be seen from Appendix-C. The demand for Coromandel indigo increased from 16.66% in 1670 to 19.35% in 1671. In the next two years, no demand for Gujarat indigo was made.

6. For comparative analysis of prices of the two varities see, Irfan Habib, Agrarian System of Mughal India, 1556-1707, pp.94-96.

7. For the comparisons I have worked out the percentages of the quantities ordered from the two regions.
This was perhaps a result of augmentation in demand for Coromandel indigo. Its share stood at 28.57% of the total demand, Biana indigo accounting for 71.42%. In 1673, Coromandel surpassed all competitors in the sense that only indigo from Coromandel was asked for. Gujarat indigo reappears in the demand list of 1674, but in a much more humble way. Its share was brought down to 6.25% in comparison to 31.25% of indigo from Coromandel. It could rise to 7.48% in the two subsequent years. The indigo export from Gujarat ceased in 1683. This was not made up by any increase in demand of indigo from Coromandel, in fact the indigo demanded from these to registered a fall not in proportion but also in absolute terms. However, in 1678 its share had risen to 39.85% but fell again to 28.57% in 1679. It declined further to 20.5% of the total in 1680. Indigo from Biana gained at the expense of these two rivals. It shot up to 80% of the total demand by 1683. Gujarat indigo reappeared from 1684, but with a much reduced share of 7.14% in comparison to Coromandel’s share of 21.42%. In 1685, it went further down to 6.66% against 26.66%. In the next three years i.e. 1686 to 1689, the Coromandel indigo superceded that of Gujarat. In 1689 both Gujarat and Coromandel came at par with each other with a share of 25% each. Increase in Gujarat’s share seems to have been caused by the introduction of Jambusar indigo. The indigo from Jambusar sold well at Amsterdam.  

8. V.O.C., 110, 14 December 1690.
Gujarat could compete closely with the indigo from Coromandel in the last decade of the 17th century as can be seen from Appendix-C. Both the trading rivals suffered owing to the emergence of a new and formidable competitor in 1697 namely Java indigo. However indigo from Java could claim only 13.40% of the total demand. In the last two years of the 17th century, Gujarat and Coromandel keenly contested. By 1700 Coromandel had a share of 5.35% and Gujarat of 5.34%. It may be pointed out here that one would have expected that demand of indigo from Surat would have been much higher owing to its proximity to Sarkhej and simultaneously being the outlet for Biana indigo, in which the Dutch apparently were dealing on much larger scale. But this was always not the case.

From our sources we can safely identify the places which contributed to the export to the Netherlands. From 1633 to as late as 1688, indigo from Gujarat was chiefly from Sarkhej. From 1689 to 1700 Jambusar also contributed in indigo exports by VOC. From Coromandel, it used to come from various places at a given point of time. Till 1640 it was coming from Pulicat and Catingan. In the demand order of 1641 there is a reference to indigo from Tegenapatnam. In almost all subsequent demand lists, there is no reference to Tegenapatnam. It was perhaps owing

9. V.O.C., 112, 15 November 1696. This is perhaps the first reference to a prospective large scale import of indigo from Java. Therefore, Moreland, From Akbar to Aurangzeb, p.113, footnote 2, rightly refers to the disappointment at the absence of positive results in Java during the 17th century.
to its identification with indigo from the Coast. Dattcheron (Draksharama) was another important place of Coromandel Coast which contributed in indigo export.

It may be noticed that in the period between 1633-1643, there remained a near uniform trend of demand in indigo from both the places. The period from 1643 to the end of 17th century is marked by a great decline in the quantity of demand for indigo. It is well reflected in the fluctuations discerned from the order lists and one can legitimately assume that indigo exports to the Netherlands were substantially reduced. Factors responsible for this decline need to be worked out. At this point our source is not very helpful.

Cotton textiles are second important article of commerce. Moreland was of the opinion that the Dutch took little share in opening up the new market (in Western Europe), though they entered this when it was an established success. Accordingly he has treated it in a very limited manner. Later Glamann worked on this theme and categorised it as a very profitable article in V.O.C.’s commerce.

In addition to indigo, Gujarat and Coromandel were important suppliers of cotton textiles. The nature of our evidence makes it difficult to show the change in the structure of trade by a study of the Heeren XVII’s orders. The difficulty is further augmented by the quality


differential among different varieties of textiles. At the same time it is also not possible to be certain about the origin of the textiles till as late as 1680. From 1680, the problem of identification of cloth is solved largely because of division of orders under specific place names. This facilitates the region-wise analysis of cotton textiles. It is widely believed that the last decade of the 17th century witnessed great rise in demand for Indian textiles. Our data push it further back to 1650s. This was caused by the change in the fashion and especially by the increased purchasing capacity of Europe. In order to reach a safer conclusion with regard to participation of Gujarat and Coromandel, we will rely on the data given from 1681.

12. Ibid, p.143. Glamann is of the opinion that it could be possible to identify the places of origin of textiles from 1668-70 inclusive. But our study shows that it is possible to determine the origin of only few cloth from 1671 onwards. Like in the case of baflas, originating from both Gujarat and Coromandel, orders specifically name the places of their origin.


<table>
<thead>
<tr>
<th>Year</th>
<th>Gujarat</th>
<th>Coromandel</th>
</tr>
</thead>
<tbody>
<tr>
<td>1681</td>
<td>56,000</td>
<td>1,30,910</td>
</tr>
<tr>
<td>1682</td>
<td>78,000</td>
<td>1,10,906</td>
</tr>
<tr>
<td>1683</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nov. 1684</td>
<td>92,500</td>
<td>1,58,206</td>
</tr>
<tr>
<td>Dec. 1684</td>
<td>1,07,000</td>
<td>3,40,000</td>
</tr>
<tr>
<td>1685</td>
<td>64,000</td>
<td>1,07,900</td>
</tr>
<tr>
<td>1686</td>
<td>46,000</td>
<td>1,59,000</td>
</tr>
<tr>
<td>1687</td>
<td>1,19,000</td>
<td>1,78,600</td>
</tr>
<tr>
<td>1688</td>
<td>1,04,000</td>
<td>1,60,000</td>
</tr>
<tr>
<td>1689</td>
<td>78,200</td>
<td>1,73,500</td>
</tr>
<tr>
<td>1690</td>
<td>95,000</td>
<td>1,89,400</td>
</tr>
<tr>
<td>1691</td>
<td>2,28,500</td>
<td>1,88,500</td>
</tr>
<tr>
<td>1692</td>
<td>1,80,500</td>
<td>1,82,800</td>
</tr>
<tr>
<td>1693</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1694</td>
<td>1,81,750</td>
<td>1,87,600</td>
</tr>
<tr>
<td>21st March 1695</td>
<td>1,87,250</td>
<td>1,92,200</td>
</tr>
<tr>
<td>5 Dec. 1695</td>
<td>1,65,500</td>
<td>1,31,400</td>
</tr>
<tr>
<td>1696</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1697</td>
<td>1,23,300</td>
<td>1,10,500</td>
</tr>
<tr>
<td>1698</td>
<td>1,35,500</td>
<td>1,29,100</td>
</tr>
<tr>
<td>1699</td>
<td>1,77,000</td>
<td>1,00,800</td>
</tr>
<tr>
<td>1700</td>
<td>2,25,000</td>
<td>1,38,800</td>
</tr>
</tbody>
</table>

Sources: V.O.C. 109-V.O.C. 112.
The figures demonstrate that a boom was witnessed from 1680 to 1700. It is seen that in the first decade, share of Gujarat in the export to Europe was comparatively less than that of Coromandel. In 1691, the exports from Gujarat exceeded the orders from Coromandel for cotton textiles the respective figures being 54.79% (2,28,500 pieces) to 45.28% (1,88,500 pieces). In the next three years they keenly contested with each other. In the order lists of the last seven years Gujarat had a lead over Coromandel, culminating in the year 1700 to a ratio of 61.84%: 31.15% of the total order from these two places. Gujarat, had thus replaced Coromandel as the chief source for supplying cotton textiles to the Amsterdam market.\(^{15}\)

It is interesting to note that Coromandel was supplying a wider variety of cotton textiles, about twenty-three kinds in comparison to nineteen from Gujarat to the West European market especially Holland. These two rival exporters faced a tough rival from within the Mughal empire namely Bengal. By 1698 more than half of the textiles went from

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\(^{15}\) This inference drawn from our figures is not in agreement with that of Coromandel shown by Glamann in Return Cargoes of 1697 which again is a rough estimate (Glamann, p.144) In the absence of any serious complaint on account of unfulfilment of the demand and in the face of Dutch efforts to supplement the supplies from Ceylon and thus augment the exports to Holland lend more reliability to the demand orders. Moreover the figures of Return Cargoes of one year is suspect due to non-availability of one or more shipments in a given year. For a discussion on the export invoices see Om Prakash, *The Dutch East India Company and the Economy of Bengal 1630-1720*, pp.262-264.
The composition of cotton textiles in the demand orders did witness change from both the regions. In the case of Coromandel, Guinees, Parcallen, and Salempuris continued to dominate, bethilles underwent a decline from 12.68% in 1681 to 8.82% in March 1698. Trend was downward in Mouris (5.04% in 1681: 1.87% in 1700), gingham gained a little (1.52% in 1681: 2.95% in 1700). Negro's cloth, Cambayes from the coast, recorded a decline while coarse camises, printed curtains printed table cloth, sailcloth, rumals d’esta, alibanis, were dropped from the demand lists after some time. Baftas and painted/printed chits maintained a relatively stable position. Dongris showed an obviously rising curve (1.26% in 1684 when it was introduced, to 10.80% in 1700). In 1695-96 some new cloth were introduced in the demand lists. Amongst them, 'Dasjens' were introduced in the list of 21st March 1695 and accounted for 10.24% of the total 1,95,2000. The proportion increased further in the demand list of 5 Dec. 1695 and rose to 15.22% and in subsequent years it went down to 4.64% (1698) and 4.32 (17 Feb. 1700). 'Boelangs' could not make much headway as its share was 0.76% in 1695 and could rise to a meagre 1.49% in 1700. 'Randams' were not well appreciated for these slumped from 1.14% in 1695 to negligible 0.36% in 1700. Thus, much information is available for relative position of various cotton textiles from Coromandel. It is not possible to compare them as

such with that of Gujarat. Nevertheless one item of cotton textiles renders limited help in a comparative study of the relative position of two rival exporters. As can be seen from the Appendix (G). Baftas from Coromandel continued to be more than that of Gujarat till 1679. But from 1680 onwards baftas from Gujarat dominated by a large margin. There was a relative stability in the number of painted chintz from Coromandel. As against it, the cheaper printed chintz from Sironj (Central India) claimed a significantly stable share amongst the Gujarati cloths over a period of time. The stability of Gujarat’s chintz assumes greater significance owing to the fact that by 1679 printing had started in Holland.\(^{17}\) Its export from Coromandel ceased. This commodity was passed over to Bengal which had an increasing share in the demand orders from 1681 onwards. At this stock taking, it becomes difficult to agree to any conclusion that painted chintz began to be exported only in the last decade of the 17\(^{th}\) century.\(^{18}\)

Amongst the cotton textiles from Gujarat, Chautar Dariabadis, cordots, baftas, patkas, birampouris, Surat’s and Sironj’s chintz, occupied a major position in the demand lists. Their relative position over a period of time can be understood from the Appendix-D given of cotton textiles


from Gujarat. Kannekins, niquanias, braules or chaders, tapij kannekins, bhermsor tapseels, can be seen as loosers in relative terms. Some cloth like guinees stuff, sester-gantijs, colawaij poos, bamboets or rottings, were dropped from the order lists presumably because they could not find a market in Holland or Europe. Unlike those, some new clothes were ordered for the first time in the last decade of the 17th century. Of them, sawaguzzees, birampuris and patkas showed remarkable progress and amongst the late comers lhymenias could not make a place.

Some qualitative material contained in the records under discussion does shed some light on reasons for the decline in the position of certain cloth in the goods ordered. Regarding mouris, it has been reported that the best and more profitable were from Tuticurin. In that year (1681) 1200 pieces were ordered from there. But Tuticurin could not compete with Coromandel, for very soon from 1687 we do not find any reference to it in the table of the goods ordered from Ceylon Appendix-F. Nevertheless it had acquired a stable market in Europe especially in France. Heeran XVII remarked in the list of 24 July 1698, “If one (you) had remitted some fine Mouris this year, the same should have obtained high price because (it) has been much in demand for France and wherefore we have now again demanded.” Guinees cloth were always in demand. From 1681, a curious phenomenon began. The Dutch started

19. V.O.C. 109 (Ceylon), 20, November 1681.

supplementing the deficiency in orders from Ceylon. Therefore in 1681, Heeren XVII advised “so much to be procured and to be sent towards here as without hindering the country trade (i.e. Asiatic trade), that there it must be preferred”. The guinees of ordinary kind (35,000 pieces) were asked for in the list of 14 Dec. 1682. Instruction was given to procure this cloth because it was used for dyeing and printing (“verwen en drucken”). The 35,000 pieces were to be supplemented by 10,000 pieces from Tuticurin for the same purpose. By 1684, Tuticurin was asked to supply 30,000 pieces along with 1,03,000 pieces from Coromandel. This expansion in the demand was presumably partly due to the quick dissemination of knowledge of printing in Holland and France and other parts of Europe. An advice was made to purchase from those places where it was cheaply available. Instruction was given to purchase them from Sadrasapatnam, Porto Novo along with Pulicat. These yeilded much profit. Those from Masulipatnam were reported to be very thin and bad

21. V.O.C., 109, 20 November 1681.
22. V.O.C., 109, 14 December 1682.
23. V.O.C., 109, 14 December 1682.
24. V.O.C., 109, 1 October 1685.
25. Ebeltje Hartkamp Jonxis, “Sits en Katoendruk, handel en fabricage in Nederland”, pp. 31-32 has traced the development and spread of cloth printing in Holland and Europe.
26. V.O.C. 109, 1 October 1685.
and were purchased for more price than they were worth. They were purchased for fl.206.5 fl.191.16. And fl.181.5. Therefore they could not yield much profit than those purchased at Pulicat for fl.142.10. Later in 1687, 65,000 pieces of bleached ordinary Guinees were to be purchased in the following manner; 15,000 pieces from Tegenapatnam, 6,000 pieces from Porto Novo, and 10,000 pieces from Negapatnam 15,000 pieces from Pulicat, 10,000 pieces from Bimilipatnam and mere 5,000 pieces from Masulipatnam.

In 1688, no guinees cloth were to be purchased at Masulipatnam as “the price had gone too high”. Heeren XVII observed, “we consider when the English do not come so frequently to the said Coast and the same as a result do not come to purchase such great quantities of Guinees cloth as we normally do, that ours in such case might have been increased well over one third part of the earlier proposed demand about guinees, and, in case by any epidemic on the coast if our demand could not be satisfied, timely advice should be given thereof to Ceylon, because the same will supplement so much as is possible”. Our series is replete with such comments. Heeren XVII considered lime-washing to be the

27. V.O.C. 110, 25 October 1686.
28. V.O.C. 110, 6 November 1687.
29. V.O.C., 110, 26 November 1688 (Ceylon), 9 December 1689.
30. Ibid., 110, 26 November 1688 (Ceylon), 9 December 1689.
reason for raising the price which prevented the acceptance of colour in printing.\textsuperscript{31} In the demand list of December 1695, the demand was reduced to half because the earlier demands were not fulfilled due to "wars of Muslims and Marathas".\textsuperscript{32} Demand from Ceylon was also reduced to half.\textsuperscript{33} It appears that previous years demand from Ceylon was met and a high profit was made. They had come from Tuticurin and Manapaer (in Ceylon).\textsuperscript{34} Later in 1698, guinees from Pondicherry was found to be of good quality and similar to that from Porto Novo. But the Dutch were obliged to vacate Pondicherry by the treaty of 1697.\textsuperscript{35} Therefore they were perturbed at the loss of Pondicherry. They decided to have the trade or else they would ask the French to vacate Batavia or contemplated to transfer "few of the best weavers with their families, should be able to move (and) to remain under the obedience of the Company at Nagapatnam or where they wish to live".\textsuperscript{36} This shows the eagerness of the Dutch. They were so keen to acquire guinees and salempuris that they asked the Batavia Government not to follow specimen strictly and should collect

\begin{itemize}
  \item \textsuperscript{31} V.O.C. 111, 21 March 1695.
  \item \textsuperscript{32} V.O.C. 111, 5 December 1695.
  \item \textsuperscript{33} Ibid.
  \item \textsuperscript{34} Ibid., 27 Maat 1697.
  \item \textsuperscript{35} V.O.C., 112, 24 July 1698, see also S. Arasaratnam, pp.93, 197.
  \item \textsuperscript{36} V.O.C. 112, 24 July 1698.
\end{itemize}
the maximum of guinees.\textsuperscript{37}

As far as chintz were concerned Coromandel seems to have occupied a relatively stable though not a very significant position in the total composition. Except 8,000 pieces (i.e. 7.41\% of the total) in 1685, it fluctuated from 0.51\% to 1.44\% during the 17\textsuperscript{th} century. Coromandel faced some competition from Tuticurin. But this competition did not last for long for it does not appear in the demand list after 1684. (See the Appendix E). The demand for it ceased since “thus nowhere in the country (Holland) is being produced much.”\textsuperscript{38}

Guinees, and Salempuris appears to be the most sought after cotton textile. It shows an absolute rate of increase in the demand lists. It started with a share of 2,000 i.e. 10.52\% of the total demand in 1681 and very soon rose to a peak 42\% in 1689 then fell to 32.42\% in 1700. Instructions were given to procure 25,000 pieces of Salempuris at Tuticurin in the list of 20 March 1684.\textsuperscript{39} Very soon Ceylon was asked to provide as much as 28,000 pieces in 1687.\textsuperscript{40} Appendix-F of the cotton textiles from Ceylon suggests emergence of another trading rival of Coromandel. In the case of sailcloth, Coromandel was a looser to Ceylon. In the case of the former,

\textsuperscript{37} Ibid.

\textsuperscript{38} V.O.C. 109, 1 October 1685.

\textsuperscript{39} V.O.C. 109, 20 Maart 1684.

\textsuperscript{40} V.O.C. 110, 5 November, 1687.
the demand ceased by 1686, while considerable demands from Ceylon continued. It reached its peak in 1692 when no less than 15,000 pieces were asked from Ceylon.

In the orders for supplies from Gujarat and Coromandel as well as from Ceylon (Bengal needs to be checked) we find a sharply rising trend in the demand of cotton textiles. It was due to the demand at Holland itself. It was noticed by the Heeren XVII in 1690 and they wrote, “by the scarcity of coarse cotton cloth here in the country has got into trouble, for the printing shops and others, to meet the convenience of, so is the procuring of guinees, salempuris and other coarse linnen in conformity, of this demand, has been recommended very highly, and so at some factories (where) the quantity could not be found, one should visit the other to supplement”.41 It is interesting to note that Holland was importing manufactured cloth to be printed and dyed there. By the second half of the 17th century, textile industry had developed so much that it is reported that three to four thousand looms had been erected at Harlem alone.42

As mentioned earlier another commodity which can help in determining the relative position of the two trading rivals is cotton yarn. There appears a regular demand for supplies of cotton yarn. Our source is not explicit till 1636. But from 1641 onwards figures stated in Dutch

41. Ibid., 110, 14 December 1690.

weight are available. These figures can be tabulated to establish the share of the two regions to discern competition. (Appendix-H). It appears that Gujarat had a near monopoly as an exporter of cotton yarn to Holland for we do not find any demand made from Coromandel after the initial vague figures till 1641.\(^43\) Vengurla on the Malabar Coast appeared as a rival from 1662. It was soon joined by Bengal which too became exporter of cotton yarn. Coromandel could enter the race only as late as 1667 when it was ordered to supply one third of the total 10,000 lbs.\(^44\) Since then it maintained its lead up to 1684 though a strong rival emerged in the form of Bengal claiming much bigger share viz. 10,000 lbs. in comparison to 6,000 lbs. each from Gujarat and Coromandel.\(^45\) From 1689 to 1695 Gujarat was perhaps far ahead with a total of 10-15000 lb. While Coromandel was the close second with 8-1000 lbs. Around this time Harlem was witnessing a crisis and was holding V.O.C. responsible for it. The owners of the looms wanted that it should send cotton yarn and silk without any interruption. In 1695, fourth rival, Java entered into this trade and was asked to supply 8-10000 pounds.\(^46\) From the subsequent demand lists Coromandel was totally dropped. Around

\(^{43}\) V.O.C., 101, 6 September, 1641.

\(^{44}\) V.O.C., 106, 18 November 1667.

\(^{45}\) V.O.C., 109, 9 December, 1634.

\(^{46}\) V.O.C., 111, 5 December 1695.
90,000 lbs. of cotton yarn were to be exported by Java alone in 1697. It was decided to improve the quality of yarn from Java and no yarn was to be received from Bengal, Coromandel, Tuticurin, Vengurla and Surat. But they could not continue to ignore Surat and Tuticurin. The reason assigned was that “we have not seen that the one at Java does not have turn of the action of the right hand straight action from the twist; becoming too firm and too crinkling (krinckeling) in one twisting becomes unsuitable for the work and so long that of Surat does not have this defect, one should send this quantity.” Therefore, similarly, cotton yarn from Tuticurin was ordered because it was desired “for spin and smooth in twisting, (so) has been most sought after”. In 1700, 20,000 lbs. of cotton yarn was demanded from Gujarat due to the policy of not letting the competitors getting any foot, “that they alone being in the market, they should come to purchase at low price to their pleasure so one should strive hard in order to deliver this quantity of the finest kind”.

Our pursuit of information in Dutch records on the Company’s purchases of Coromandel and Gujarat goods has led us through a long story of competition between Coromandel and Gujarat as alternative

47. V.O.C. 112, 21 March 1697.
48. Ibid.
49. Ibid.
50. Ibid.
51. Ibid., 112, 17 Feb., 1700.
suppliers in indigo, cotton textiles and yarn in the course of the seventeenth century. But while for most of the century purchases from one region compensated for declines of trade in the other; the picture changes substantially towards the close of the century. Java indigo begins to heavily supplant Coromandel and Sarkhej indigo. Textile printing in Holland adversely affected Dutch purchases of chintz and prints in India; and exports of cotton yarn declined sharply owing to factors yet to be fully investigated. This decline was not mainly because of any shortage of capital in the hands of the Dutch Company or local competition, factors which T. Raychaudhuri stresses; rather it reflected a major change in the pattern of production and demand on the world scale.
TEXTILE COMMERCE AT MALDA

The inland town of Malda and its relations with port cities of Bengal on the one hand and inland cities like Patna, Banaras and Agra on the other form an interesting subject of study. Malda is situated close to the confluence of the rivers Kalindri and Mahananda. It was accessible mainly by rivers from Murshidabad and Hoogly.

Bengal was a major exporting region of India by the second half of the 16th century, notably, with silk emerging as an important item of export. Chittagong, Sonargaon and Bakla were important manufacturing centres of cotton goods. It seems, however, the Malda had not emerged as an important manufacturing centre by the end of the 16th century. Malda was an administrative centre, it is true, by the time of the Ain-i Akbari, being the headquarters of a jujwar (group of parganas) in the sarkar of Gaur. Fitch (1583-1591) does not mention Malda while describing


important places of Bengal. He travelled from Agra to Tanda and touched the ruined city of Gaur. It is surprising to find Malda despite its proximity to Gaur and Tanda not attracting his attention.\(^5\) We start hearing about Malda from the second decade of the 17\(^{th}\) century. The English East India Company factor Robert Hughes reported from Patna to the President and Council at Surat (12 July 1620) that the Portuguese, Mughals and other merchants were at Patna "like bees, whose chiefest provisions were mandyles, girdles, layches and dupattas of Malda."\(^6\) These were purchased at Patna to be exported to Persia via Lahore.\(^7\) Patna continued as an important market for procuring textiles from Malda. Peter Mundy refers to four kinds of clothes namely malmalshashi, orhni, balaband and alachah from Malda.\(^8\) Subsequently Malda became an important centre of trade for the Dutch and English East India Companies. Also there were merchants from Persia and occasionally from Pegu.\(^9\) Hendricq Cansius was entrusted in 1670 with the task of exploring the prospects


\(^6\) *E.F.I. 1618-1621*, p.195.

\(^7\) Ibid., pp.195, 270; *E.F.I. 1651-1654*, p.52.

\(^8\) Mundy, II, pp.154-155, 362, 366.

of trade at Malda.\textsuperscript{10} Cansius found that the town was full of weavers.\textsuperscript{11} Soon afterwards Constantin Ranst, despatched Hendricq Cansius to purchase cloth in Malda.\textsuperscript{12} He described it as a densely populated town, stretching out on both sides of a sprout of the Ganges.\textsuperscript{13} He observes that Malda was situated 14 miles north of the great Ganges, surrounded by several towns, villages and hamlets (gehugten). Interestingly, he gives description of some of them. The town of Douanhadt (?) was half a day’s journey from Malda where alacha, jamawar and gerrys worth Rs. 100,000/- were produced.\textsuperscript{14} Daudpur, Salgabasapour and Seret (?) together produced malmal worth Rs.100,000/-.\textsuperscript{15} Alua and Caylgan\textsuperscript{16} contributed coarse and fine khasa to the amount of Rs.150,000/-.\textsuperscript{17} Lagon and Dapot, around three days journey from Malda, produced coarse khasa

\begin{itemize}
\item \textsuperscript{10} K.A. 1167, 1455r-1455v.
\item \textsuperscript{11} Ibid., f. 1455r.
\item \textsuperscript{12} K.A. 1168, f. 2173r-2175r. Cansius reached Gaur on 27 July 1670 and found it lay in ruins.
\item \textsuperscript{13} K.A. 1168, f. 2173r.
\item \textsuperscript{14} K.A. 1168, f.2173r.
\item \textsuperscript{15} Ibid.
\item \textsuperscript{16} Perhaps Kaliganj village in Rangpur, W.W. Hunter. \textit{A Statistical Account of Bengal}, VII, London 1876, pp. 164, 304, 309. Cansius writes that it was only 1½ days journey from Malda.
\item \textsuperscript{17} K.A. 1168, f.2173r.
\end{itemize}
upto the value of Rs.80,000/-. This kind of coarse khasa was known as Lagon after the name of the place of production.\textsuperscript{18} Malikpur (‘Melckpour’)\textsuperscript{19} was about 2 day’s journey and was famous for dopattas, mandils and gangajal, orhni. Besides these, there were Sialgan, Sripur (Ceerpour), Saijshaet, Haripur, Baazpur (‘Baasepour’) and Dadepur (‘Dadepour’) which were located all around Malda at the distances of 3, 4 and 5 day’s journey.\textsuperscript{20} Together they (annually) produced several kinds of cloth worth Rs.200,000/- alongwith substantial quantity of silk and sugar.\textsuperscript{21} These places still had 150,200 to 350 villages under them.\textsuperscript{22}

\textsuperscript{18} Ibid.

\textsuperscript{19} Atlas of the Mughal Empire, 11A, 23+, 89+.

\textsuperscript{20} K.A. 1168, 2173r.

\textsuperscript{21} Ibid. However, Sushil Chaudhuri, “The Asian merchants and Companies in Bengal’s trade, circa, mid-eighteenth century”, Sushil Chaudhuri and Michel Morineau, eds., Merchants, Companies and Trade, Europe and Asia in the Early Modern Era, pp.302-303, moderates the figure of Rs.200,000/- given by Hendricq Cansius to Rs. 0.8 to 1 million.

\textsuperscript{22} Ibid. See also Om Prakash, The Dutch East India Company and the Economy of Bengal 1630-1720, pp.98-99. Sushil Chaudhuri, From Prosperity to Decline: Eighteenth Century Bengal, Delhi, 1995, pp.136. Though it is not my direct concern here to show the incorrectness of Om Prakash’s assesment of aurung. It will not be correct to characterize these 150-350 villages as aurung. See Walter K. Firminger, ed., “The Malda Diary and Consultations (1680-1682)”, Journal of the Asiatic Society of Bengal (henceforth “Malda Diary and Consultations”), New Series, XIV, 1918, pp.106,115, 122, 202. It may however, be emphasized that aurung was a different kind of organization meant
evidence give us an idea of the number of the towns, and villages surrounding Malda, where textiles were manufactured. The area also produced wheat, sugar and ginger available for export. The inhabitants of these places had apparently textile manufacture as their main source of earning. In September 1670, Cansius purchased various kinds of textiles and silk to the amount Rs.2315, 9½ annas. He also purchased 9-1/3 sers of divers silks at Basitpur. He found that a sum of Rs.150,000/ could be invested in obtaining silk alone. The silk produced here was sent to Surat, Diu, Daman and Goa. Each ser cost 84 Sicca rupees. While enumerating the advantages of trade at Malda, Cansius observes that prices of cloth at Malda were less than other places. For example, on each pack of 20 pieces of fine or coarse cloth, the merchant had to pay in tax only 5½ annas whereas in Rajamahal or Patna it amounted to 6½. Similarly, in the whole route to Malda no illegal exactions took place. In a recent study, Sushil Chaudhuri had pointed out on the basis

Contd...

to work as workshop. Sushil Chaudhuri, op.cit., regards them to be production centres in the district.

23. K.A. 1168, f. 2173.
24. Ibid.
25. Ibid.
27. Ibid.
28. Ibid.
of the evidence provided by Richard Edward’s report of 1676, that the Asian merchants were exporting textiles from Malda worth around Rs. 2 to 3 million and in order to reconcile the figures of Cansius and Edwards, he assumed that Asian merchants alone were exporting textiles approximately between 1 to 3 millions in 1670s. Malda textiles were cheaper than those from Dacca. Considerable number of Persian and ‘Hindustani’ merchants visited Malda. Two of them came with bills of exchange, one for the sum of Rs.100,000/-, the other for Rs.65,000/- which were spent before the departure of Cansius, i.e. within very short time. Cansius observes that a sum of Rs.8-10,00,000/- were invested in cloth which were later sent to Surat, Persia and through land route upto Italy. This is perhaps the earliest estimate in the Dutch records of the volume of textile exports from Malda by both Asian as well as European merchants. Thus Malda had already emerged as a significant centre of textile production where by 1670 the Dutch East India Company alone had invested 80 or Rs.100,000/- in purchase of textiles. There were some traders from Pegu who had visited Malda for 6 years before Cansius.


31. K.A. 1168, f. 217r.

32. Ibid.
They had brought rubies from Pegu which could not sell well.\(^ \text{33} \) The items of import that sold well were copper, pepper, cloves, zinc, and sandal wood.\(^ \text{34} \)

Nicolas Couckebacker and bookkeeper Servaas de Carpenter found most of the reports to be true.\(^ \text{35} \) By October 1673, they found that the prices of various commodities have declined between 1670 and 1673. For example, price of copper in September 1670 was Rs.58/= to Rs.60/= per maund of 73-61 Dutch pound,\(^ \text{36} \) which came down to Rs.43/= in October 1673, i.e. by about one fourth. They found that the English East India Company merchants and other inland merchants from Balasore, Hugly, Qasimbazar had brought considerable quantity of those commodities and that had caused decline in prices.\(^ \text{37} \) Still, there was a great demand for copper because it was used for making copper/brass ware there.\(^ \text{38} \) These brass and copperwares were sent to Rangamati and Arakan.\(^ \text{39} \) The Dutch factors themselves had purchased cloth worth £.

\(^ \text{33} \) K.A. 1168, f. 217r.

\(^ \text{34} \) Ibid.

\(^ \text{35} \) K.A. 1185, f.669r.

\(^ \text{36} \) K.A. 1168, f. 2174vo.

\(^ \text{37} \) K.A. 1185, f.669vo.

\(^ \text{38} \) Ibid. f. 670r.

\(^ \text{39} \) K.A. 1185, f. 670r.
On cloth from Malda for Persia a net profit of 41-1/2% was reported in to be usual in 1675.

Malda by this time had become a very important centre of long distance internal trade as well. According to Master, 15 to 25 'pattelaes' or large boats were loaded "Yearly" with khasa, malmal, mandil, and elaicha. When loaded with these goods, each patela carried worth one lakh of rupees, when these goods were mixed with silk, a patela-load was judged worth half of that amount. This would suggest a volume of textiles transported say, worth Rs.10 lakhs to Rs.20 lakhs rather than Rs.22.5 to 37.5 lakhs estimated by Irfan Habib on the basis of a different interpretation of this passage. Textiles worth Rs.3 lakhs were despatched to Dhaka, and same amount worth to Rajamahal and Makhsudabad.

Trade in Malda textiles carried on by the Dutch also continued to grow. The Dutch East India Company's records reveal considerable profit over its investments, as shown by the following table:

40. Ibid.

41. Generale Missven, 1675-1685, IV, p.10.

42. Master, I, pp.339-400.

43. Irfan Habib, "Notes on Indian Textile Industry in the 17th Century", p.188.

44. Master, I, p.400.
<table>
<thead>
<tr>
<th>Year</th>
<th>Place</th>
<th>Profit</th>
<th>Expenditure/Loss</th>
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<td>Malda</td>
<td>f. 2011. 10. 7</td>
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<tr>
<td>1680</td>
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<td>1681</td>
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<td>f. 1902. 1. 9</td>
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<td>1682</td>
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<td>f. 2201. 18. 8</td>
<td>f. 5568. 5. 10</td>
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<td>1684</td>
<td>&quot;</td>
<td>f. 2294. 5. 5</td>
<td>f. 5747. 14. 8</td>
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<td>1685</td>
<td>&quot;</td>
<td>f. 3720. ---.--</td>
<td>f. 6187. ---.--</td>
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Source: *Generale Missiven*, 1675-1685, IV.

Thereafter the Dutch officials started experiencing the difficulties in pursuing their trade at Malda by the beginning of 1684. It was found that it was hazardous to give money in advance to the producers. By February 1685, the Dutch had already given Rs.25,725/- in advance.45

By 1686 the Company withdrew its factory from Dacca and was contemplating to close Malda factory also.46 Due to political uncertainties in the last decade of 17th Century, Dutch started losing interest in Malda.47

It was found that Hugli was comparatively a better place to procure the commodities which were available at Malda.48


47. Ibid.

During the third quarter of the 17th century, English East India Company also began to deal in textiles from Malda. It was noted that, "Maulda goods we find the goods of which you sent us Musters are very well liked of here, and therefore we have ordered a large quantity thereof to be provided, to which end we order that you invest there, of the stock we now send you, invest there, in the goods we write for, to the value of Rs.80,000/= or Rs.100,000/=". Fyteh Needham and Jonathan Prickman hired a house in Malda after their arrival. This accommodation had three different rates of rent, one at Rs.7/=, the second at Rs.4½ and the third at 1½ per month. It seems it was quite easy to hire a house in Malda. On 20th August, 1680, they hired a house from Dilawar Khan for their godown. It was made of brick and the rent was Rs.2- 8 annas per month. They continued to pay rent for these houses even when they were not in use. In December 1680, they purchased a piece of land at Makhdumpur, 2 miles away from Malda on the other side of the river. The seller was Rajaray Chaudhuri. The piece of land was seven bighas and Rajaray

49. Master, I, pp.25-26, 399-400.

50. Ibid., p.26


52. Ibid., pp.65, 156-57

53. Ibid., pp. 156-57

54. Ibid., p.81.

55. Ibid., p.81. See also Irfan Habib, The Agrarian System of Mughal India, 1556-1707, p.335, especially footnote 110.
Chaudhuri was paid Rs.300/ for this. Apart from this, Rajaray was paid Rs.300/- for bringing bricks. In July 1681, they decided to purchase further 8 bighas of land from Rajaray. Rajaray was the main supplier of brick and stone for constructing house. He was paid Rs.2040/- The place came to be known as Englezaved within Makhdumpur. On 4th September 1681 Rajaray was paid Rs.500/ for bringing stones for the building. Between 24.8.1680 to 29.10.1682, a sum of Rs.4240/- was already spent on building the factory at Malda.

If we examine the records available in “Malda Diary and Consultations”, we find that the Company operated either by directly purchasing or contracting with weavers or local merchants and brokers (dalals). We give in Appendix-I an illustrative list of persons (merchants and artisans) from whom they obtained their supplies against advances. In one year of 1680, Shambhudas Brahman a respectable merchant

56. “Malda Diary and Consultations”, p.121.

57. Ibid., p.122.

58. Ibid., p.123.

59. Ibid., p.125.

60. Ibid., 129.

61. Ibid., 138.

62. Ibid., pp.122, 123, 125, 129, 131, 134, 139, 146, 151, 185, 204, 205, 206, 212-13.
apparently was contracted for Rs.5300/= Shripal Dalal, broker by designation was given Rs.19,232/= to procure cloth. On 30th January 1681, alone the Company had contracted with individual weavers of tanjeebs up to the amount Rs.50,973/=. In the whole year, Rs.2,49,190/= were contractually committed to procure cotton goods by the English East India Company. In 1682, it stood at Rs.1,36,086/=. Trade was facilitated by the ready availability of money on interest. On 15th July 1680, Rs.1500/= were borrowed from one 'Perranaut' (Pran Nath) At the rate of 1 rupee per cent per month. On 15 July 1680, Rs.1050/= were borrowed from Herderum Twearee (Hardiram Tiwari). Rs.1000/= were taken on interest from Cunjemen Said and Harderam Teewri (Hardiram Tiwari) each on 21 July 1680. Herderam Tewari seems to be a considerably wealthy merchant at Malda. He was ready to give Rs.20/= 50,000/= rupees on interest. Ghanshyamdas had given

64. Ibid., pp.49, 52, 59, 62, 66, 81.
65. See Appendix-I.
66. Ibid.
68. Ibid. pp.54-59.
69. Ibid. p.59
70. Ibid. p.88
Rs.17,900/= on interest. Pran Nath had given Rs.5,850/- in January 1680. There are many instances of borrowing money on interest. This ready accessibility of cash would have naturally helped the expansion of trade.

Various reasons have been suggested for the apparent late entry of the Dutch and following them English East India Companies in Bengal in general and Malda in particular. Om Prakash is of the opinion that Bengal did not attract the attention of the Dutch because they considered Bengal textiles to be not very advantageous in the Indonesian trade up to about 1650. They got interested only after their discovery of utility of Bengal silks and cottons in carrying out the Japanese and European trade. Dutch exports of Bengal textiles rose by more than half by the end of the century. An interest in the cottons is discernible from sale figures of cotton at Kamer Amertardam, 1649-50-1733-34. By 1697, the Company's total import was to the amount of fl.5.4 million Bengal's share was 1.75 million or just under one third. Glamann has suggested

71. Ibid. p.91.
72. Ibid.
73. Ibid., pp.93, 155, 165, 167, 173, 178, 186, 188, 190, 192, 193, 194, 199, 208, 210, 212-13.
74. Om Prakash, The Dutch East India Company and the Economy of Bengal, 1630-1720, p.67.
75. Glamann, pp. 143-144.
that there was a fall in trade from Gujarat and Coromandel because of tense conditions there.\textsuperscript{76} In this burgeoning trade in Bengal textiles, Malda occupied for a considerable time a growing share. It seems that Bengal silk received preference over Persian silk by the mid-17\textsuperscript{th} Century.\textsuperscript{77} It gives more profit than that from Persia. Bengal silk was also found to be cheaper than silk from China. Bengali cotton textiles also yielded more profit in Persia, Europe and South-East Asia. This expanded the demand for textiles from Bengal and Bengal on the other hand was well equipped with its network of commercial practices and extensive production centres to cope with the expansion in demand. From the list of merchants in the Appendix-I, we find that mostly Gujarati merchants were involved in organizing the textile industry even in a far off place like Malda.

Thus we find that Malda continued to enjoy prominence as a trading and administrative centre throughout the seventeenth century.

\textsuperscript{76} Ibid.

\textsuperscript{77} K.N. Chaudhuri, \textit{The Trading World of Asia and the English East India Company}, 1660-1760, p.345.
In recent years, historians of European trade in pre-colonial India have paid considerable attention to the overseas trade conducted by the European companies through various coastal towns. But the hinterland serving them remains inadequately addressed. This is partly caused by the paucity of evidence and partly because the European sources were mostly concerned with either coastal areas or overseas trade. It is true that European sources are undoubtedly rich for reconstructing the commercial history of coastal regions, but, inland areas too deserve to be studied. It is by keeping this in view, that we have chosen to study the textile trade of Awadh. The commodities of Awadh origin were transported through Agra to the port of Surat to be shipped abroad from there.\(^1\) In fact it has rightly been pointed out that a complex combination of inland trade through water and overland, by short-haul shipping and large caravans (10000 to 40000 pack animals) crisscrossed the entire subcontinent.\(^2\) M.N. Pearson has characterized the “relation between activities on land and sea as symbiotic, but asymmetric. Most of the time sea activities had less influence on those on land than vice-versa”.\(^3\) We


\(^3\) M.N. Pearson, *India and the Indian ocean, 1500-1800*, p.5.
will try to look at Awadh as a part of inter-regional and international trade. B.R. Grover in an important paper surveys the information on Awadh for different industrial products. He identified saltpetre and gumlac as the two major products of Awadh. Hameeda Khatoon Naqvi also touches upon some aspects of this trade. However, so far the Dutch evidence for Awadh, especially on the Dutch Company's export of textiles from the region, seems to have escaped scholarly scrutiny.

Awadh was a well recognized geographical tract which had five sarkars and thirty-eight parganas under Akbar. It covered an area of 135 kos from the sarkar of Gorakhpur to Kanauj and 115 kos from the Himalayas to Sidhpur bordering the suba (province) of Allahabad. It had on its east Bihar; in the north, Himalaya; in the south, Manikpur;


5. Ibid.


and on the west, Kannauj. It was well suited for agriculture. Agricultural lands of Awadh were irrigated by the Saru (Sarju) and Ghagharra. Abul Fazl notices the seasonal inundations of the fields every year which was considered especially good for rice cultivation. The perennial river water and seasonal inundations provided natural enrichment of the soil through irrigation and fertilization. Close to Ajodhya/Ayodhya, there was a village called Dugaon which had a mint for copper coinage for a long time. Abul Fazl observed an exchange of commodities within *suba* of Awadh in an interesting passage. Awadh received gold, copper, lead, musk, tails of the *kutas* cow, honey, chuk (an acid composed of orange juice and lemon boiled together), pomegranate seeds, ginger, long pepper, majit-root (*Rubia Cordifolia*), borax, zedoary, wax, woollen stuff, wooden ware, hawks, falcons, black falcons, merlins, etc. In return, the people of northern mountains received “white and coloured cloth”, amber, salt, assafoetida, ornaments, glass and earthen ware. The goods had to be

9. Ibid.

10. Ibid.

11. Ibid.


14. Ibid.
carried on the backs of men and stout ponies. Shireen Moosvi finds that Awadh was one of those subas which to judge by taxation had a lower degree of urbanisation than provinces like Gujarat and Agra. This, however, need not have affected the scale of its long-distance commerce.

The Dutch East India Company officials realized the commercial importance of Awadh as early as 1622 when they sent Trikam Das, a broker to Agra with bills of exchange worth 5000 mahmudis, to be invested presumably in textiles from Awadh. The Dutch subsequently went on pursuing trade in Awadh textiles. Agra was understandably the main transit market for textiles from Awadh to Surat. The English factors reported on 2 January 1636 that they had

"instantly dispeeded advise unto Dongee in Agra that he should with all convenient expedition buy and send downe unto Suratt Derriabauds, Keriabauds, and Echbaryes (sortes of white cloth, and brought downe from that place in great quantityes) to the value of 1000 rupees. Some of these are already on their way".

It was found that in buying Awadh textiles Agra had a considerable advantage over Gujarat in terms of both price and quality. On 7 May

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15. Ibid.


18. E.F.I.1630-1633, pp.82, 179.


20. E.F.I.1637-1641, p.57.
1636, an assistant Joan Tack and the broker ‘Moon Das’ were sent to Agra to invest 30 to 350000 rupees in purchasing cloths for Persia, Holland and Batavia. But due to some delay the caffila from Ahmadabad could not reach Agra in time. In order to avoid a year’s lagging behind they purchased some substitute cloths worth fl.30,000 which was worth fl. 22,000 in Ahmadabad. It still rendered considerable profit in Persia and Gambroon. The Dutch factor Barent Pretersen had sent cloths worth fl.31505.2 from Agra to Surat 14 November 1636. In February 1637 alone, textiles from Awadh worth fl.52278.16.8 were despatched to Gambroon. Agra thus emerged as a major market for cloth for we hear of the availability here of broad baftas and coarse baftas originating from Corseth i.e., Khursat, a place outside suba Awadh. The Dutch Governor General on 9 December 1637 reported to the Directors of the V.O.C., at Amsterdam, that at Neggapour (Nagpur?), Khairabad and the Purabs ('eastern' marts) or in the quarters of Benares, as observed by Sr. Wollenbrand Geleynssen de Jong and Arent Barents., there was a very


22. Ibid.

23. Ibid., p.103.

24. Ibid., p.103.

25. Ibid., p.267.

26. *Atlas of the Mughal Empire*, maps, 8A-8B, 26+, 80+ 33; see also *E.F.I. 1655-60*, p.70.
brisk textile trade. According to one of their reports, Muslim merchants carried a very vigorous trade in Awadh textiles, exporting these to Persia, Arabia and Turkey through the caravan route via Kandahar. The cloth came from the countries of Purab (Awadh etc.), Benaras, and Farraabath(?). They used to transport 25 to 30000 camel loads of textiles. This would amount to 1020000 to 12240000 Dutch pond which was obviously a huge quantity. Thomas Cuyck, a Dutch factor was sent to Benaras in 1639 to inquire into the varieties of textiles to be procured there for Persia. In Ispahan in Iran, it was found that candy sugar had declined in value but other merchants had reaped a profit of 50% from importing cloth from Agra. Not to be left behind, two factors of English East India Company John Turner and Fracis Hamersly were exhorted to ensure a supply of 20000 pieces of 'Dereabauds' (cloth from Daryabad, Awadh). Francis Bornford was ordered to "invest such sortments of browne cloth as the Ahmadabad merchants use to sell your people theare,


29. Ibid., One camel load was equivalent to 408 Dutch pound. This equivalence is incidentally given in Van Dam, II(3), p.281.


31. Ibid., p.135.

32. *E.F.I. 1637-1641*, p.278.
as mercooles and eckbaries (whereof bryams and selaes are made) and
guzzees (which are usually transformed into blew baftaes), cannikeenes
of both sorts, ardeas, and other sortments required for Bantam and besides
very vendible in Persia, Bussora, Mocha, yea, all alongst the coast of
Arabia". In comparison to competing varieties from Ahmadabad, they
were 15 -20 per cent cheaper at Agra.

In December 1641, the Dutch had borrowed at Agra 1,63,300
rupees on interest. To pay it back they remitted 80,000 rupees with a
loss of 2-11/16 percent to be paid back in 18 days, and were contemplating
to send 60 to 70000 rupees at the first opportunity. This amount was
presumably to be spent on purchasing indigo and Awadh textiles. To add
to their woe, the coarse textiles in Jalalpur and Khairabad (Awadh) had
risen by 25 percent in comparison to the previous year due to a great rise
in the price of cotton. Even then it was hoped that market would be full
of textiles and purchases could be made. Broad baftas and other cloth

33. Ibid.
34. Ibid.
35. H.T., Colenbrander, ed., Dagh-Register gehouden in 't Casteel
36. Ibid., pp. 185, 200.
37. Ibid.
38. Ibid.
(red chelas at Jalalpur) had become dearer by 2 rupees per corge.\(^{39}\) The English had sent a broker to purchase cloth at Jalalpur.\(^{40}\) In Lucknow also some Daryabads were to be purchased.\(^{41}\) In 1641 the Dutch had exported a cargo worth fl. 1,10,880 which had 87 packs of textiles from Agra along with other commodities.\(^{42}\) The ship Snouck also had a cargo of Muslims and banyas comprising 731 packs (two of textiles) worth fl. 9,501.\(^{43}\) For Mocha the Dutch already had ready a cargo of fl.41,294.5 of cloth.\(^{44}\) In December 1641, Weijland had purchased 527 corges (1 corge = 20 pieces) of a variety of textiles.\(^{45}\) The Director had sent 75,000 rupees for the dual purposes of procurement of textiles and to pay back the money borrowed on interest requiring repayment within 18 days at the rate of 2½ per month.\(^{46}\) By the end of 1641, it was estimated that the Dutch factory at Agra was assisted by an amount of 2,05,000 rupees to

\(^{39}\) Ibid., p.186.

\(^{40}\) Ibid.

\(^{41}\) Ibid.

\(^{42}\) J. A. Van der Chys, ed., *Dagh Register gehouden in't Casteel Batavia, 1640-1641*, Batavia Hague, 1887, p.309.

\(^{43}\) Ibid.

\(^{44}\) Ibid.

\(^{45}\) *Dagh Register 1641-1642*, p.187.

\(^{46}\) Ibid.
pay for rupees 1,63,000 borrowed on interest. By this time at Jalalpur and Khairabad more than 75000 rupees had been invested in purchase of textiles, because now this amount was withdrawn from these two places. This would make the total amount of money available at Agra to be 2,80,000, if considered along with 2,05,000 rupees previously sent. This is indicative of the rising curve of Dutch investments in Agra and Awadh to procure indigo and textiles. It was hoped that Persia would be provided with cloth exclusively from Agra worth fl.58458 because textiles from Ahmadabad were proving unprofitable in the preceding three years.

The Dutch factories at Surat, Ahmadabad and Agra had borrowed fl.6,30,894.17 at the rate of 1-7/8 per cent to invest in diverse commodities. On 12 October, upper merchant (oppercoopman) Weijland sent a caffila of 76 carts to Surat, which had not reached there, with goods worth fl. 1,75,988.8. It was found in 1642 that it would not be possible to fulfill the demand for the year 1643. Nevertheless 143 packs of Agra cloth were already purchased despite a 40 percent rise in their prices. Due to the scantiness of cotton harvest, the cloth had become

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47. Ibid.
48. Ibid., p.188.
49. Ibid.
50. Ibid., p.190.
51. Ibid., p.194.
52. Ibid.
dearer by 16 percent in comparison to the previous year. The upper merchant (oppercoopman) Sr. Weijland had invested Rs.31,165 in diverse kinds of textiles available at Agra (i.e. Awadh and Agra) to be despatched to Holland and Persia.

The English Company's records of around this time provide some additional information. The English factors observed that cloth purchased at Agra was not only cheaper but better also. Of the three kinds, Mercools or broad baftas were the best, but they were not well bleached. Daryabads were preferred over Khairabads (both varieties of Awadh cloth) which were more broad than required. Poor manufacture and bleaching, however, put the cloth from Awadh at a disadvantageous position vis-a-vis linen from Scotland, Germany and France. Mercools were found equal to broad baftas of Baroda or Broach, but they were more even and well made than the latter. The Surat Council demanded 15-20,000 of

53. Ibid.

54. Ibid., p.205.

55. F. Foster, ed. *E.F.I. 1637-1641*, p.57.

56. Ibid., p.57.

57. Ibid.

58. Ibid., p.311.

59. Ibid., pp.311-312. They decided to purchase them in 1644 if they were fifteen yards long and one yard wide, see, *E.F.I. 1642-1645*, p.203-204.
Mercools and 2,000 Daryabads be bought. Subsequently, the two varieties were sent to England in good quantity. Akbaris were found a longer and broader sort of Agra cloth than the Mercools. A large quantity of these were purchased and “transformed in Ahmadabad into byrams, selaes, cassedees, large chints, and other sorts of sundry denominations, requested at Bantam and Mocha”. Still they were to be exported along with ‘guzzees’ which were to be transformed into cannekins, etc. Around 1000 pieces were due to be exported.

The value of the Awadh trade for the Dutch can be judged from the fact that they obtained a farman from the Mughal emperor Shahjahan to protect it as early as 1642. We give below a translation of it from the Dutch rendering of the Persian original:

60. E.F.I. 1637-1641, p.312.
62. Ibid., pp.6, 123.
63. Ibid., p.6.
64. Ibid., pp.7, 123-124, 137 204.
65. Ibid.
66. Shahjahan’s farman is available to us in a Dutch translation in H.T. Colenbrander, ed., Dagh-Register gehouden in’t Casteel Batavia 1643-1644, ’s-Gravenhage, 1902, p.170. The scattered translations of farmans from 1618 to 1729 were brought together by J. Schreuder. The volume is available in the “Archives transferred from Asia, Documents deriving from the High Government at Batavia, 1602-1827”, in the Algemeen Rijksarchief, First Section, ’s-Gravenhage.
“Translation of the farman in the Persian language granted by the King Shahjahan for the benefit of the General Netherland’s Chartered East India Company to Mr. Paulus Krook director of Surat’s directorate in the 16th year of His Majesty’s reign on the 14 Shaban, 1052 and accordingly to our time in the year 1643.

All governors, foujdaars, and zamindars, watchmen in the highways, from the port of Pipli up to Agra, are informed, that whereas the King has permitted the Dutch to bring to Agra the commodities which they collect in Banaras, Jualpoer (Jalalpur), Gairabad (Khairabad) and other places, and (whereas) when they bring to this place and convey expensive commodities, tolls and rahdaris are extorted (from the Dutch) in all villages, resting places and roads, by several watchmen there, and also under other pretensions they do trouble them, not allowing them free passage from place to place; now, therefore, the King has ordered that henceforth none will have the power to demand rahdaris, charges, etc, more than is authorized. But in the entire dominions of the King where His Majesty’s pen has granted the privilege, they be allowed to go to and fro freely, and may not be troubled in any part under any pretext whatsoever. They are exempted from everything: in this respect earlier farmans were granted to them, as are in their possession. The King also permitted them, to choose what roads they use, or in what resting places they desire to stay; none should trouble them (over this). Likewise in the purchase of indigo and other goods, wherein they may use such brokers
and servants as they themselves wished of their own; should they petition again to the King after this (farman), that someone had transgressed his order, (the transgressors) shall have to explain themselves before the King. It is written that the King’s order as issued now is not to be deemed altered”.

Thus, unlike the English, the Dutch were provided with royal protection against such abnormal custom exactions. This exemption was particularly important for the Dutch, since in 1643, the prices of textiles from Agra rose by 37 percent and in their the purchases of textiles they thereby suffered a loss of 10 percent on abaseys (abassis), though a profit of 27 percent still remained.67 The price increase was perhaps caused by the pestilence which had struck Agra in 1643.68 It was estimated that everyday 600 people were dying.69 Several thousand houses were deserted.70 Still trade in textiles continued.71 A hundred bales of daryabad were purchased of 10,000 pieces in the next season.72 The Dutch sent a cargo of Agra cloth worth fl.1,23,708 to Persia.73 In June 1644, they

67. Ibid., p.197.

68. Ibid., p.197.

69. Ibid., p.196.

70. Ibid.


72. Ibid.

73. Dagh-Register 1643-1644, p.179.
desired 1000 pieces of 'Guinea' cloth from Jalalpur at the rate of Rs.6.00 per piece. It would be priced at 7½ rupees each at Ahmadabad, which would cover the other expenses involved. There was some slackness in trade in textiles from Agra in Persia. Some of them were sold at 10% profit, which was lost in exchange on the abbasis. Nevertheless by the end of 1644, the Dutch factors at Agra had already employed 3,00,000 rupees presumably to purchase indigo of Biana and Khurja and textiles from various places including Awadh. Similarly, the English also purchased 30000 pieces of Daryabads, of which 15000 pieces were meant for England and the rest for Mocha and Basra.

It is reported that the Dutch factors attached so much importance to cloth from Khairabad that they had their residence there before 1645, and this used to save Rs.5.00 per corge on purchase of Khairabads. These sold at Rs. 20 per corge and at Agra at the rate of Rs.25.00 per corge.

74. Ibid., p.194.

75. Ibid.


77. Ibid.

78. Ibid., p.332.


80. Ibid., p.300.

The English hoped to reap extra profit by directly purchasing Khairabads at Khairabad.\(^\text{82}\) It was found that there was a decline in their quality.\(^\text{83}\) Still they were instructed to purchase 15,000 Mercools and 20,000 Daryabads.\(^\text{84}\) The English also hired a house at Lucknow to pursue trade there (19 July 1647).\(^\text{85}\) In 1648, the English purchased 261 bales of cloth (apparently Daryabads) at Lucknow worth Rupees 27,465 and 67 piece.\(^\text{86}\) They were despatched directly from Lucknow to Ahmadabad because bullock carts were not available at Agra. The King had impounded all the carts and camels to carry royal goods to Lahore.\(^\text{87}\) In February 1650, longe guzees were supplied from Lucknow and dyed at Ahmadabad.\(^\text{88}\)

By mid-17th century brisk trade had been established in Awadh textiles. The Dutch factors reported from Agra that the English, Muslim, Armenian and Banya merchants were busy purchasing considerable quantities to be exported to Gambroon.\(^\text{89}\) Other adjoining places were

\(^{82}\) Ibid.


\(^{84}\) Ibid. It seems that by 1647 Sanganer turned up as a competitor of Khairabad. Mercools were purchased there to be transformed into ‘tappi chindos’ and broad ‘chhints’ (chintz), Ibid.

\(^{85}\) \textit{E.F.I. 1646-1650}, p. 140.

\(^{86}\) Ibid., p. 188.

\(^{87}\) Ibid., p. 225.

\(^{88}\) Ibid., p. 299.

\(^{89}\) \textit{Generale Missiven 1639-1655}, II, p. 550.
also explored for supply of such cloth. The English spotted Nowgaon (in Hardoi District) as a place from where Mercools could be obtained at the rate of 28-29 rupees per corge (which was eight rupees higher than last year).\textsuperscript{90} The cloth had become little expensive because of the failure of crops, dearness of cotton and scarcity of pyce.\textsuperscript{91} Mercools from Nowgaon were found to be of inferior quality and it was decided that they should be obtained at “Deraibaud” (Daryabad) towns.\textsuperscript{92}

It seems that the English, eventually come to realize that they were not getting the desired results from investing money in cloth from Awadh. The demand for these textiles had suffered a setback in Persia.\textsuperscript{93} They found their station at Lucknow very remote and ‘chargeable’.\textsuperscript{94} In May 1652 they ordered a dissolution of their house at Lucknow.\textsuperscript{95} Daryabads were indeed required, but were to be purchased at Agra.\textsuperscript{96} Apart from a fall in demand in Persia, the Lucknow factory suffered because of the “Illicit use of its funds”, resulting in a heavy debt for the English

\textsuperscript{90.} E.F.I. 1651-1654, pp.9-10.

\textsuperscript{91.} E.F.I. 1646-1650, p.322; E.F.I. 1651-1654, pp.9-10.

\textsuperscript{92.} E.F.I. 1651-1654, p.122.

\textsuperscript{93.} Ibid., pp.148-9.

\textsuperscript{94.} Ibid.

\textsuperscript{95.} Ibid., E.F.I. 1655-1660, p.16; E.F.I., 1661-1664, p.94.

\textsuperscript{96.} E.F.I. 1651-1654, pp.177, 216.
The Dutch Company on the other hand, continued their trade. In 1655, they found that their trade in Persia with textiles from Agra had improved. They devised a new method of purchase. All cloth was neither to be purchased by Company factors nor by subordinate banias alone. Half of the demand was to be purchased by each of them, so as to keep them in competition. Secondly, the Company’s brokers were also suspected of foul play. Consequently the Dutch residents in Persia complained several times that the textiles sent to them from India were much dearer than previously. Their explanation used to be that owing to cloth brought by Muslim and Bania merchants from Surat to Gambroon, the Dutch could not sell their inland Indian cloth at good profit. This was explained as the cause behind cloth brought by Dutch becoming relatively expensive. The last batch of cloth from Agra was inspected by the Director and persons with expertise in Surat. Both

98. Generale Missiven 1655-1674, III, p.36.
99. Ibid.
100. Ibid.
101. Ibid.
102. Ibid.
103. Ibid.
kinds were compared.\textsuperscript{104} It was found that those purchased by banias were cheaper than those bought by the Company chief at Agra.\textsuperscript{105} But those purchased by the Company’s residents proved more profitable in Persia.\textsuperscript{106} Through this examination of the supplies, the Director could put some check on peculation and also ensured the quality of cloth. If we look at a contemporary profile of Company’s investments in various factories it will give us the relative importance of them in the Dutch scheme of things.

1. Agra  
   (presumably dealing largely in textiles from Awadh and adjacent areas as well as indigo from Biana and Khurja).  
   fl. 1,50,000

2. Ahmadabad  
   fl. 69000

3. Sind  
   fl. 36000

4. Broach  
   fl. 6933

5. Surat  
   fl. 40000

Total  
fl. 3,02,533

Source: \textit{Generale Missiven 1655-1674}, III, p.73

Thus Agra, the main entrepot for Awadh cloth accounted for half of the investments made from Surat.

\textsuperscript{104} Ibid.

\textsuperscript{105} \textit{Generale Missiven 1655-1674}, III, p.36-37.

\textsuperscript{106} Ibid.
But due to war of succession among the Mughal princes, 1658-59, difficulty was experienced in obtaining indigo as well textiles.\textsuperscript{107} In comparison to previous investments, in 1659 only fl.5000 were to be invested.\textsuperscript{108} The textile production in Agra and Awadh suffered so much that in 1661 the English could not procure any Daryabad, Mercool or Akbari at Surat, or Ahmadabad.\textsuperscript{109} Even in England, there was a loss of 15 percent on the previous three years' stock.\textsuperscript{110} It sold at 85 percent of the purchase price.\textsuperscript{111} The things went so bad that they decided to dissolve factories at Agra, Ahmadabad, Mocha and Basra.\textsuperscript{112} The English Company resorted to purchasing these cloth through brokers on 'bemah' (Hind. Berra, ensurance).\textsuperscript{113} Several shroffs were interested.\textsuperscript{114} But they promised to invest 100,000 rupees in Agra only if the Company paid them Rs.20,000 in cash at Surat.\textsuperscript{115} The second alternative they contemplated

\begin{footnotesize}
\begin{enumerate}
\item \textsuperscript{107} Ibid., pp.227, 275.
\item \textsuperscript{108} Ibid., p.276.
\item \textsuperscript{109} \textit{E.F.I. 1661-1664}, pp.18-26.
\item \textsuperscript{110} \textit{E.F.I. 1661-1664}, pp.18, 22, 26, 94.
\item \textsuperscript{111} Ibid., p.18.
\item \textsuperscript{112} Ibid.
\item \textsuperscript{113} Ibid., p.86.
\item \textsuperscript{114} Ibid.
\item \textsuperscript{115} Ibid.
\end{enumerate}
\end{footnotesize}
was the inducement of weavers round Surat to weave a cloth of 7/8 yard broad and 13 or 14 long to substitute for the Daryabads.\textsuperscript{116}

The Dutch East India Company sent their chief (Director) of the Surat factory Dircq van Adrichem (1662-1665) to the imperial court to seek a \textit{farman}. He succeeded in obtaining a farman on 20 October 1662 from Aurangzeb which conferred valuable privileges upon the Dutch Company. The farman in a translated form is preserved in Kol. Arch. 1129, fol. 1321-6. The farman has also been produced in \textit{Dagh-Register gehouden in't Casteel Batavia}, 1663, pp.301-302. J. de Heers has published it in voluminous \textit{Corpus Diplomaticum}, II, pp.220-222. We have used the Dutch translation given by Schreuder.

\begin{quote}
"Translation of the Firman, in the Persian language, granted by the King Orangzeet (Aurangzeb) for the benefits of general Netherlands Chartered East India Company to the Director and ambassador Dirk van Adrichem, in the 5th year of Majesty’s reign, the Rabiul awwal 1071, or according to our reckoning the year 1662.\textsuperscript{117}"

"All governors, authorities, lower authorities, commanders, governors (landvoogdens) and keepers (wagters),\textsuperscript{118} the way, present and

\textsuperscript{116}Ibid., p.187.

\textsuperscript{117}Schreuder’s preamble does not mention the day of Hijri calender while Dr. A.J. Bernet Kempers’ version does not mention the year of Hijri calender. The day was 5th of \textit{Rabiul Awwal}, in Christian reckoning 20 October.

\textsuperscript{118}Bernet Kempers’ edition to “King’s capital Agra”, See A.J. Bernet Kempers, ed., \textit{Journal van Dircq van Adrichem's Hofreis naar den
future, (ones), in the province of Ackberabaath (Akbarabad), Oeth
(Awadh) and Allabaath (allahabad), who should be in expectation of
favours from the Emperor.

Whereas in these days when the gateway of justice is open, Dirk
van Adrichem, commander and ambassador of the Governor General of
the Dutch, has appeared before his Majesty's throne through the medium
of the persons concerned with the King's affairs and has petitioned that
the Dutch trade in Surat in some goods and thereupon textiles, indigo,
saltpetre, and other merchandise in Banaras, Jaalpoer (Jalalpur),
Gairabaad (Khairabad), Licqnoov (Lucknow), Chorsa (Khurja), Beana
(Biana), Hindoon (Hindaun), Besauwer (Bisawar), and other places (and)
bring (them) to Agra and again carry some other merchandise from Agra
to Surat; that they were granted several farmans by his late Majesty Sja
Jehaan (Shahjahan), whereby they are free from all charges and rahdaris
as are taken in Monthasabaad (Mumtazabad), further, that there was
taken 1. percent brokerage of indigo from the sellers according to the old
custom and then 1 percent is taken from the purchaser about which the
Dutch had not yet petitioned; still their commodities were brought to the

Contd....

See also Tavenier, I, p.297. Tavernier writes that Dirck van Adrichem
was received well by the Emperor. See also, Ishrat Alam, "Dutch
Trade in Awadh: Farmans of Shahjahan and Aurangzeb", _P.I.H.C._,
62nd session, Bhopal, 2001, pp.256-260 for translation of these
two farmans.

119.Bernet Kemper's, p.221, rendering has Taasgentsche (i.e. Tajganj).
Therefore, he has prayed that the King be pleased to order that the Dutch might not have to pay the rahdari they were paying at Mumtazabad on account of some other charges which were not adjusted. Still the brokerage according to the old custom on indigo should not be claimed, but continue to be taken at 1 percent from the seller; and they should not be obliged to bring their goods to the toll house. Also in accordance with the old custom they were not to pay in the sjagens (Shahganj).

On this petition the King has ordered that the Governor of Agra was not to levy tolls, rahdaris, and other rates and taxes (lasten) from the Dutch according to the former customs which were taken in Montasabaad; there shall be brokerage on the purchase, but the brokerage will be demanded from the vendor according to the old custom. Also their goods shall not be brought to the toll-house, nor following the previous custom anything will be taken from them at Sjagens (Shahganj). Meanwhile nobody shall demand anything above the customary standard (afwijken).

The petitioner pleaded further that in the order of the King may be given that the Dutch may purchase indigo, textiles, saltpetre and other goods from such merchants as they wished, and that they may sell their commodities to such of them as they desired, also that they can use such brokers in their service as they may choose, so that nobody was to interfere with their servants without their special consent.
On this request, Kings order has been given, that none should cause any difficulty to the Dutch in the above matters.

Further the abovementioned suppliant pleaded that the king should give an order, that they should be able to hire as many carts, camels, etc. as they might need for bringing and transporting their merchandise and that in this nobody should harass them; that no merchants, lessors or other persons who are indebted to them (the Dutch), should try to evade payment, nor should anyone take such persons under his protection; that none of the authorities should demand of them any rahdari or charges on the road; wherefrom they are exempt in accordance with the farman granted by Shahjahan.

The King has therefore, ordered that nobody shall prevent the Dutch from hiring as many camels, carts, etc., as they might need to bring in and transport their commodities; that no merchant or other persons who are indebted should delay repayment of money, or make evasion, the Dutch be helped to recover their outstanding moneys (penningen. lit. money) according to right and reason; and no one should pose himself to protect the debtors. No one should trouble them by levying any charges on the way and rahdari, such as is prohibited by the King’s court, but should protect them and their goods and each official is duty-bound to conduct their goods from one jurisdiction to another. Know that this was earnestly prayed for and that the order of the King does not diminish in strength; nor that every year a new farman need be procured".
Armed with such a comprehensive farman the Dutch sent their broker Vallabh Das with 4,000 rupees to invest in purchasing 8,000 pieces of Daryabadis and 2,000 pieces of Mahmudis (perhaps Mercools) at Lucknow and Jalalpur. In the early 1663, the English made a contract with Piru Saddarang, of the Jooneja caste to provide 20,000 pieces of Daryabads and 1000 Mercools. Rs.10,000 were given in advance. It was promised that he would be paid Rs.15,000 on dispatch of the goods, and he had to receive the balance a month after the cloth was received. He was to be paid 10.5% commission along with all transport charges. They found it to be an extremely difficult proposition. Their assessment was that despite their approaching the weavers in their houses in villages or suburbs, they had failed to convince them to change the size of the cloth. Secondly, they held the Dutch responsible for their failure. They observed, “they (the weavers) would with lesse trouble have been brought to, were it not for other buyers, that stand not upon it soe much as wee doe, especially our never failinge obstructers the Dutch, who look neither to thicke nor thin, broad or narrow, if they want not above half or three

120. *Journal van Dircq van Adrichem*, 1662, p.107.
122. Ibid.
123. Ibid.
124. Ibid., pp.208-209.
quarters of a yard in length and two or three and a half inches in breadth; which makes us thinke sometimes that they doe it on purpose to wary us out and hinder our buying any ...”

Thirdly, the objections of contract merchants were that prices fluctuated because of rise in the prices of food crops or cotton. The transportation was subject to several customary taxes as well as frequent raiding of caravans by robbers.

Fourthly, the contract merchants demanded 20-30,000 rupees in advance to get cloth from Agra or Awadh. The English factors were ready to purchase Sovaguzzees as substitute of Daryabads. In 1666 and 1667, there was a fall in the demand for such cloth in Persia. Nevertheless, the English could get Piru Hingola, a broker, to procure such goods from Agra and its neighbourhood after receiving an advance of 30,000 rupees and a commission of 10 per cent. He agreed to supply 16,000 pieces of Daryabads and 8,000 pieces of Mercools. With the same person a

125. Ibid., p.201.

126. Ibid.

127. Ibid.

128. Ibid.

129. Ibid., p.200.


second contract was signed on 6 July 1668. The Dutch also continued
to invest in indigo and cloth from Agra. They had fl.2,92,054.11.5 at
Surat in December 1679, out of which fl. 1,09,327 were earmarked for
investment in Agra, i.e. 37% of the total capital available at Surat, and
34,000 rupees at Agra. But by now instead of textiles, the Dutch
investment was predominantly confined to procurement of indigo and
silk at Agra. So far as their trade at Lucknow and other places in Awadh
is concerned, the Dutch interest had slackened. Aurengzeb’s farman of
4th July 1693 refers to Farangi Mahal as nazul property. It was given
to Mulla Said and others for the residence of the family. Nevertheless
the Dutch continued to have business there. Hendrik Zwaardecroon and
others wrote on 14 May 1700 that the Dutch factors had been ordered to
procure 30,000 pieces of chautars of Daryabad and 2,000 Dutch pound
of indigo Biana. J.J. Ketelaar was appointed as second in 1698 at

133. Ibid.


135. Muhammad Raza Ansari, Bani Daras-i Nizami, Mulla Nizamuddin
Muhammad, Aligarh, 1973, p.76, for the text of the farman; see
also Iqbal Husain, “From Traditional Roots to Nationalism - A
History of the Farangi Mahal Family”, Islamic Culture, LXXIV(3),
July 2000, pp.1-3, See footnote 1, especially for the controversy
about its seizure from the Dutch.

136. Iqbal Husain, p.3.

137. J. Ph. Vogel, ed., Journaal van J.J. Keteaar’s Hofreis naar den
 Lucknow.\textsuperscript{138} He appointed Meyders as subaltern chief of Lucknow.\textsuperscript{139}

Thus the Dutch trade continued in Awadh throughout the 17th century with fluctuating fortune.

\textsuperscript{138} Ibid., p.28.

\textsuperscript{139} J.J. Ketelaar's Hofreis, 1711-1713, p.99.
CONCLUSION

Technology and Forms of Labour

In the cotton industry there was progress in technology marked particularly by intermittent and limited technological development and few significant breakthroughs in medieval times such as the draw-loom, block printing, carpet-weaving, sericulture, and mortar-and-lime indigo vats (confined to north India). Our study also shows that pace of technological diffusion in the textiles sector in pre-industrial times, was quite varied. While India was a source of certain textile tools, along with the principles of technology, like the ancient cotton-gin involving the earliest known example of application of parallel worm gearing, and the carders’ bow string device. On the other hand, it received spinning wheel, treadles in the loom, draw-loom, block-printing, sericulture, indigo-boilers from outside. Manufacture of cotton was diffused to China from India first in the 6th century AD, and in the second phase in the 13th century AD. Similarly, manufacture of cotton was possibly conveyed from India to Britain in the 16th Century AD, probably as part of the so-called ‘new draperies’ transition. Ever since Britain received it, the consequences proved to be drastic eventually leading to the Industrial Revolution.


2. Ibid. See also K.N. Chaudhuri, The Trading World of Asia and the English East India Company, 1660-1750,
The textile crafts were carried on mostly in villages up to the stage of spinning. Until in the sixteenth century spinners were largely confined to villages. The famous poet Mukundram Chakkrabarti Kabikankar (16th century) does not refer to spinners in towns in the long list of various craftsmen. This is not to suggest that spinners were not to be found in urban centres. The introduction of spinning wheel (13th-14th centuries AD) had enhanced the feasibility of production of increased quantity of spun-yarn, since the spinning wheel should have increased yarn production six-fold within the same labour-time. This device possibly facilitated the rise of specialised spinners based in towns along with their village-based counterparts, as was noticed by Duarte Barbosa. It has rightly been pointed out that in the customary gender-division of labour...
many of the harder and arduous parts of the work were assigned to women.\textsuperscript{6} There are numerous references to them. Spinning yarn attracted an increasing number of people of different castes. Spinning was pursued by women of both low as well high castes. Women of Brahman castes also spun yarn especially in Bihar and Bengal,\textsuperscript{7} though not in southern India where women of Brahman castes could not take to it.\textsuperscript{8}

The use of a special kind of cotton by the spinners mostly women of Dacca and districts around it has been considered responsible for the production of the muslin thread.\textsuperscript{9} We have seen that the cotton of India was derived mainly from two species (as discussed in Chapter 1.), the reason could not be as much in the quality of cotton as in the technology of spinning. Specialised spinners were required to produce very thin yarn for the famous Dacca muslin and the finest yarn was spun with needle like bamboo spindles rotated on pieces of hollow shells. The wheel, on the other hand, was employed for coarser cotton fabrics.\textsuperscript{10} It is interesting


\textsuperscript{7} Alexander I. Thitcherov, \textit{Indian Changing Economic Structure in the Sixteenth to Eighteenth centuries, Outline History of Crafts and Trade}, p.58.

\textsuperscript{8} Ibid.

\textsuperscript{9} S. Bhattacharya, \textit{The East India Company and the Economy of Bengal from 1704 to 1740}, London, 1954, p.183.

\textsuperscript{10} Irfan Habib, “Technological Changes and Society, 13\textsuperscript{th}-14\textsuperscript{th} Centuries”, p.143.
to note that in Bengal the superior quality threads were spun by women of higher castes, including Brahmans, whereas the coarser thread was spun by women of the common peasants “who could not spin fine thread because their fingers were rendered stiff by hard work”.

Gender-division in textile craft is also reflected in an Ajanta fresco (Plate I) and other literary evidence. They invariably refer to the involvement of women in all the processes preceding weaving, e.g. women cleaning cotton through roller-and-board method and cotton-gin, spinning of cotton, all shown in the same Ajanta fresco. Spinning by women continued in medieval times. However men also started separating cotton seeds from cotton, as shown by Miftah-ul-Fuzala illustration of the device *Chobkin*. Similarly carding of cotton with a bow string device became a part of paraphernalia of a male itinerant carder. It has rightly been pointed out that women’s role in the textile industry extended not only to helping the weaver (usually male) to set up loom and warp and weft, but


12. See Pl. I.

13. For 13th-14th to 16th century, see Irfan Habib, “Exploring Medieval Gender History” p.2; for 17th century see Chapter 1. in the present thesis pp.60-63.

14. See Pl. II.

15. See Pls. IV & V.
also to dyeing, printing, painting and embroidering cloth.\textsuperscript{16}

Wouter Schouten (1676) found women operating looms, a supposedly male prerogative. Schouten writes, “Yet only the men but also the ladies in these countries (he is speaking of the Coromandel coast) know how to operate the weaving loom and then earn (still in a better way) their livelihood.”\textsuperscript{17} Thus the entire burden of labour in the textile crafts was shared by males along with females.

The Social Framework

So far caste system’s influence on textile artisans during 16\textsuperscript{th}-17\textsuperscript{th} century is concerned, it seems that there was no rigid barrier to adoption or adaptation in textile industry. There are instances of simple “skill compensation” from the textile industry itself. For example, Irfan Habib has cited instances of dexterity by artisans of Dacca in producing the famous Dacca muslin and weaving embroidered shawls on simple looms instead of the draw-loom specifically used for such designs in Iran.\textsuperscript{18} By the Mughal times there was a kind of super-abundance of cheap skilled labour created by centuries of “commodity or market oriented

\textsuperscript{16} Irfan Habib, “Exploring Medieval Gender History”, p.2.

\textsuperscript{17} Wouter Schouten, \textit{Oost-Indische Voyagie}, Amsterdam, 1676, p.294.

\textsuperscript{18} Irfan Habib, “Capacity of Technological Change in Mughal India”, in Aniruddha Ray and S.K. Bagchi, eds., \textit{Technology in Ancient and Medieval India}, Delhi, 1986, p.7.
production."¹⁹ This has been considered a major factor responsible for the development of extreme specialization and multiplicity of professions.²⁰ It seems that the caste system contributed also to the evolution of craft specialization in textile industry. Babur speaks of caste-based transfer of acquired knowledge of a craft. He writes, "... every artisan there (Hindustan) follows the trade that has come down to him from forefather to forefather."²¹ At another place enumerating the advantages of Hindustan, he writes, "Another good thing in Hindustan is that it has unnumbered and endless workmen of every kind. There is a fixed caste (jami) for every sort of work and for every thing, which has done work or that thing from father to son till now. ... In the same way there are numberless artisans and workmen of every sort in Hindustan."²² Edward Terry (1616-19) refers to the hold of caste system. He writes, "And so among all the Gentiles the men take the daughters of those to be their wives which are of their fathers tribe, sect and occupation [emphasis

19. Ibid.


22. Ibid., p.520.
added]; for instance, a merchants sonne marries a merchants daughter. And every mans sonne that lives by his labour (emphasis added) marries the daughter of him that is of his owne profession; by which meanes they never advance themselves [emphasis added].”

Pelsaert (1627) refers to three ways in which heathens (i.e. Hindus) especially ‘Banias’ earn their livlihood. First of all they were the best merchants and jewellers. Second, they were mostly the artisans because all the handicrafts were made mostly by heathens, and very few by the Muslims, besides dyers and weavers. His observation that in few places Hindus pursued dyeing and weaving and everywhere, and also sometimes Muslims suggests that despite caste rigidities among the Hindu artisans, Muslims could also take to this craft.

Pelsaert refers to the precarious condition of many artisans. But they accepted their miserable poverty and professed that they did not deserve anything better. They had no hope of improving their condition, “because a workman’s children can follow no occupation than that of their father, nor can they inter-marry with any other caste.”


26. Ibid.
identifies three groups of people who were indeed nominally free, but whose status did not differ much from voluntary slavery. They were artisans, peons or servants and shopkeepers. He writes that there were two kinds of scourges, namely low wages and forced labour. Goldsmiths, painters, embroiderers, carpet makers, cotton or silk weavers, blacksmiths, coppersmiths, tailors, masons, builders, stonecutters, a hundred craft in all, many of these by working from morning to night could earn only 5 or 6 tackas (possibly dams), that is 4 or 5 pennies in wages. Secondly the governor, nobles, Diwan, Kotwal, bakhshi and other administrative officers could force them to work for them on half payment. This reduced them to abject poverty.

Like Pelsaert, Wollebrandt Geleynssen de Jongh (1632-1636) observed that “in Gujarat among the banias there are many dyers, beaters of cloth (ljiwaet kloppers?) and those who perform the work of peasants, ploughing and sowing, also many artisans like carpenters, smiths, shoemakers, tailors and many more artisans, though they are not so rigorously

27. Ibid.
28. Ibid.
29. Ibid., pp.308-309.
30. Ibid.
32. Ibid.
tied to their law as those who earn their livelihood through trade, they are also considered the best and purest of the Banias. In short, know that they earn their livelihood in all things according to their caste or lineage (geslachte), because everyone must pursue such means of livelihood as their elders and race (generation) had done, to wit, a carpenter’s son necessarily be a carpenter and marry the daughter of a carpenter, similarly a smith, carver, shoe maker, weaver, and so forth, wherein each must remain and marry, as his caste determines, and if someone does not marry in his own caste, he is despised, and is considered disgraceful.”

Similar kind of caste rigidity among the practitioners of textile crafts as well as others is reflected in P.V.D.B.’s (1677) account of Indian society. He writes, “There are various races (i.e. castes), which remain in one work, there are chettis who are merchants, there are also market porters and the like; there are some of the painters’ caste, also merchants, by which one has no success, but this is the custom of the country, that weavers ‘children will learn weavers’ crafts, and such is (the caste) with all, smiths bring smiths, carpenters, brazier, and casters (gieter), silver smiths, each furthers his craft, . . . .”

Subsequently, Weber observed that professional castes, particularly those of textile crafts, were “the very pillars of rigid caste segregation and tradition alongside pure peasant castes, for which a rigid

33. Remonstrantie van W. Geleynssen de Jongh, pp.73-74.

34. P.V.D.B., p.49.
traditionalism goes without saying.” This proves a social barrier in the path of intercraft mobility of professional skills and diffusion of techniques. However, Morris D. Morris questioned the validity of Weber’s arguments and asserted that there were no specific instances of rejection of any technique by Indian craftsmen on the basis of their caste ritual or traditions. Sabyasachi Bhattacharya comes closer to Weber when he considers the question of textile artisans’ adoption of European silk filature, and the cotton ginning machine. He held that the adoption of new technology would have implied extraneous control over the artisans’ process of production and in the process he would loose his independence. In other words, he also considered the artisans’ psychology as an important factor inhibiting the rapid diffusion of a


39. Ibid.
superior technological device.\textsuperscript{40} And these psychological reasons were possibly because of the control, rigidity and segregation of skills by caste system.

However, the extent of caste determinism should not be over-emphasised. Irfan Habib has questioned the rationality of application of the role of the caste system in Indian society.\textsuperscript{41} In practice, the artisans based on the caste system faced a challenge from the mass of ordinary or unskilled people who formed a reserve and from whom new classes of skilled professions might emerge when the situation demanded. Secondly, there is no evidence to prove that weavers were “eternally fixed in their attachment to single professions or skills”. For example we hear of radical transformation in the caste status of some artisans in the 16\textsuperscript{th} century. We hear of Ramdas, a master dyer of Akbar who presumably combined his professional occupation of dyeing along with possessing 37 bighas of land for cultivation.\textsuperscript{42} Then, there are illuminating accounts of Kabir (a weaver), Dadu (a cotton-carder), Namdev (a calicoprinter), Ravidas

\textsuperscript{40} For a critique of such a stimulating argument, see Harbans Mukhia, “Social Resistance to Superior Technology: The Filature in Eighteenth Century Bengal”, \textit{I.H.R.}, XI(1-2), 1984-85, pp-56-64. Mukhia explains that resistance to filature lay in economic reasons and not socio-psychological factors.

\textsuperscript{41} Irfan Habib, “Potentialities of Capitalistic Development in the Economy of Mughal India”, pp.216-217.

\textsuperscript{42} Irfan Habib, “Three Early \textit{farmans} of Akbar, in favour of Ramdas, the Master Dyer”, p.274.
(a barber) and Nanak (a petty grocer) all of whom belonged to the artisanal castes and sub-castes (jatis) but sought equality with upper castes not by seeking mythological origins or claiming ritual purity, but by rejecting the caste system. Similar views are expressed in early seventeenth century composition of Guru Arjan (died 1606).

Vijaya Ramaswamy has brought out the fact that unlike the artisans of north India, there was an upward movement among most of the Sudra professional groups such as smiths, weavers and oil pressers in South India. They were not satisfied with the low place assigned to them in caste hierarchy on account of accumulation of wealth and extraction of social privileges. Unlike their northern counter-parts, who believed in negation of caste system, the artisans of southern India sought mythological origins and status of Brahmans. In other words, they aspired for caste exaltation and not caste negation.

S. Arasaratnam speaks about considerable mobility among weavers, both geographically and socially. The major weaving castes had

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45. Vijaya Ramaswamy, Textiles and Weavers in Medieval South India, p.115.
moved and spread out of their original homelands and still maintained their links through territorial ties and through common ritual and worship centres. S. Arasaratnam has cited examples of artisans moving into, and out of weaving as an occupation, and the splintering of weaving castes on the basis of specialization. Caste weavers also subsisted on agricultural pursuits. There are, however, instances of weavers who specialized in textile trading or farming as their sole occupation. Besides, there were other occupational castes like those of fishermen and landless labourers of untouchable castes, who opted for weaving as a profession. The occupational mobility was caused possibly by unusual expansion in demand for textiles both for internal consumption and export.

Some of S. Arasaratnam’s conclusions are based on facts reported from the 18th and 19th. Hence they do not constitute very firm evidence for understanding caste mobility in the previous centuries. His suggestion that fishing and farm labour also opted for weaving also needs attestation from contemporary sources. Our own study of some contract documents

46. S. Arasaratnam, pp.216-217, 265-68.

47. S. Arasaratnam, pp.266-267. It confirms what Barrington Moore Jr. had observed about Moreland that he in his detailed descriptions of “Mogul Society” had very little to say about the caste system, which was flourishing at that time since centuries. This arose possibly because of Moreland’s dependence on Mughal administrative documents and travellers’ accounts whose focus was not the village community, where caste was the basis of division of labour. Moore also complains about Irfan Habib’s Agrarian System of Mughal India (1st edition) touching “lightly on caste, though somewhat more than Moreland”, see Barrington Moore Jr., Social Origins of Dictatorship and Democracy, 1st pub., New York, 1966, rep. Middlesex, 1967, Peregrine Books, 1979, pp.317-18.
signed between the Dutch East India Company and painters/printers and weavers, do show, however, that many people from the caste of weavers and painters/printers had taken to mercantile activities.48

Thus one can safely say that castes could change their established professions. This is attested in the earlier part of 18th century: from Maharashtra. Some members of a caste of tailors moved to dyeing and others to indigo dyeing.49

There was already a large reserve of Muslim artisans and labouring communities in the 16th and 17th centuries50 created since the establishment of the Sultanate. In the early 17th century Pelsaert refers to the presence of this section of the artisans in society when he refers to sources of livelihood of ordinary people. He writes, “Second (First were best merchants and jewellers) artisans, because all the handicrafts are made by the heathens and scarcely some by Muslims, that at some places are heathens but all are Muslims.”51 This section of the population was free from some of the rigours (not all) of the caste system and not subject to

48. See Chapter 9.


51. Pelsaert, p.327.
any insurmountable obstacle to occupational mobility. The presence of sizeable section of Muslim weavers and artisans could have contributed to mobility and competition among artisans along with introduction of new techniques. This is possibly the reason that we hear about an agreement between the cloth and yarn merchants in a Tamil inscription of 1538. It states, “... while we are assembling here ... in the course of weaving by handlooms, one third of the Sadisarakkudam or achchukkattu should be drawn lengthwise and two third of the cotton yarn should be used in cross-wise weaving. This mode of weaving should be done only by the Muslims (and not by the Hindus). As a reward for their services (ostensibly in acknowledgement of their newly introduced craft) they were authorized to collect the income from the gifted lands for their weaving.”

Similarly, in 1679 Streyensham Master reported that at Ellur (A.P.) the manufacture of woollen carpets on vertical looms with coloured woollen weft threads, in accordance with patterns set on paper, was introduced a century earlier by Persian (i.e. Muslim) artisans.

This evidence suggest the role of caste was hindered by the presence of new set of artisans in Muslims and their association with new technologies which they introduced into India. Occasionally Mughal


administration also played a crucial role in limiting the role of caste system and encouraged occupational mobility for its own advantage. Aurangzeb ordered that at Ahmadabad all persons who so wished should be allowed to learn the crafts of weaving, needle-making and embroidery. Such a situation is reflected in Geleynssen de Jongh's observation (1629) about Ahmedabad. He writes, "any merchant or artisan may come freely to reside here, earn his livelihood with his handicraft or business without molestation or contradicted by any ......... ."

Therefore once occupational mobility is admitted, it has rightly been observed, that theoretical rigidity looses its teeth. Secondly, castes were weaker than guilds owing to a comparatively loose organization; and because of this reason they had to depend on administration for its support and also suffer its interference.

Thus, it is not to deny that caste system was not a social reality, but the contention that it had a substantial role in restricting the mobility

54. Ali Muhammad Khan, Mirat-i-Ahmadi, ed. Nawab Ali, Baroda, Vol.I, p.260, cited by Irfan Habib, Potentialities of Capitalistic Development in the Economy of Mughal India", p.217. Irfan Habib, also cites the example of Aurangzeb's refusal to recognize the monopoly of the Srimal caste in the work of smelting and drawing wire at the Ahmedabad mint because such restrictions were against the law, Mirat-i-Ahmadi, I, pp.292-93.


56. A.J. Qaisar, The Indian Response to European Technology and Culture (AD 1498-1707), Delhi, 1982, pp. 138-139.

of labour and thus creating a scarcity of skilled labour may well be doubted.

**Forms of Production**

By and large the form of production may be defined as domestic. The artisan owned the basic tools like the loom with which he worked, procured yarn (cotton, or silk as the case may be), and dyes and then took the finished products to the near markets and sold it to the merchants.

Such conditions are best illustrated by reports on calico manufacture from Patna. Robert Hughes reported from Patna in July 1620: "... the usual custom of buying the amberty calicoes at Lackhoure (which the ‘pente’ or fair for that commodity, and is a town 14 course (kos) from this place) is as follows: there are daily brought in from the neighbouring gonges [ganj] by the weavers, from whom they are bought raw, of length 13 coveds ‘Jehangery’ (which is one-fourth longer than the ‘elahye’ of Agra), from which the buyer, of an ancient custom, ‘teares’ of 1½ or 2 coveds, and so delivers them marked to the whitster, who detains them in whiting and starching about three months, the charge whereof is near upon 3 ru [pees] per corge, and the abatements and disturys (dasturi) in buying them raw from the weavers 4/16 per rupee or 25 per cent. In this manner, by report daily may there be bought 50, 60 and some days 100 pieces. Almost in the like nature are they sold here in Puttana, being likewise brought thence by the weavers, but ready whited and cured, and the same customs and abatements as in the
country" (spellings modernized). In a subsequent report of 10 November 1620, he writes, “buying them ["amberty callicoes"] at the left hand, to say, from the weavers which bring them ready to town is only to serve the bazaar, and merchants that make their provisions abroad will not sell here for a halfe a savoye profitt”. In November 30, 1620, it was reported: “The amberty callicoes are made a day’s going from this place in a ‘prigonye’ (pargana) or ‘shier’ (shahar, town) called Lackhower, where they are to be bought of all prices, infinite quantities, from the poor weavers which make them, brown, wherof there are three sortes; the first narrow breadths, and are commonly called ‘rasseys’, generally coarse, and few or none above two rup[ee]s net the piece of about half a yard broad and 13 yards long; the next sort are called ‘zefferconnyes’, and most may be one-fourth broader then the former, but much finer and of higher prices, from two to six rup[ee]s per piece; and the third and best sort the broadest and finest, known here by the name of ‘Jehangeres’, whereof some are a full English yard and few or none above; neither can the weavers conveniently make them broader (as they themselves say) to have them substantially and close woven. The best and cheapest course would be to buy them raw, and have them bleached afterwards”.

60. *E.F.I. 1618-1621*, p.213.
W. Geleynssen de Jongh (1630) writing about Broach, observed “the trade is conducted in cash because the weavers, who are poor people, cannot purchase on credit, know how to earn by working from dawn to dusk, there they usually regulate according to their reckoning and consumption; besides that there is no way to give credit to weavers, but on the contrary must give their money in hand, from that they purchase yarn first, from which they make cloth; and the money coming from that is paid for yarn.”61

Production was thus strongly affected if the individual artisans were faced with the vagaries of the market. It seems that the famine of 1630-31 brought about considerable change in the structure of the textile industry, which was reflected in the mobility and the extent of adaptation by the artisans involved. Since the prices of foodgrains escalated, the weavers desperately speeded up their production to sell in the market.62 This led to further relative decline of prices of textiles.63 The entire payment was made partly or fully in food items.64 But this proved very expensive.65 Besides, there was large scale migration of weavers to Agra


63. Ibid.

64. Ibid.

65. Ibid.
and Awadh on account of famine. But later they came back. 66

A similar situation was observed in Thatta. John Spiller complained in September 1647 that weavers at Thatta "are a company of base rogues, for notwithstanding we give them money aforehand ... part of year, and in the time of thence [their] greatest want, yet, if any pending cloth merchant comes to buy, they leave us and worke for him, though he gives no money aforehand; . . ." 67

Such information is not available to us during the sixteenth century, and in the secondary literature there has been a curious lacuna, even in studies using Portuguese. 68 For the 17th century, however, our information confirming similar conditions of domestic production are confirmed by evidence from Bengal 69 and the Coromandel coast. 70 This mode of

66. Ibid.


68. e.g. K.S. Mathew, Portuguese Trade with India in the Sixteenth Century; S. Jeyaseela-Stephen, The Coromandel Coast and Its Hinterland, Economy, Society and Political System (AD 1500-1600). See also Vijaya Ramaswamy, Textiles and Weavers in Medieval South India, deals with improvements of weavers' class/caste position, but does not say anything about their production methods.

69. Cf. Om Prakash, p.98 (especially for the 17th Century); Sushil Chaudhuri, From Prosperity to Decline: Eighteenth Century Bengal, pp.155-175.

organisation continued up to the first half of the 18th century.\textsuperscript{71}

\textbf{Merchants and Artisans}

The main lever of merchant’s control over weavers was through the system of advances mostly in the form of money, or foodgrain or work-material, in order to ensure regular supplies.\textsuperscript{72} The report of 6 August 1620 says about weavers of Lakhawar: “Lackhower affords great quantities of fine cloth, to say of four, six, eight to ten rupees per piece, and by bespeaking them and delivering moneys out beforehand, the weavers will make them a full Jehanger coved broad which is yard, half quarter English . . .”\textsuperscript{73}

Though advances led to the subjection of weavers to the creditors’ interests, this did not transform the basic position of weaver as an artisan. There are examples of weavers working for the European East India Companies sometimes had to adjust by altering the size of their looms. For example, it is reported that weavers at Lakhawar after receiving money in advance from merchants or the Company agreed to alter the size of the loom.\textsuperscript{74} It was reported in December 31, 1630 by President Rastell from Surat that the factors were instructed “to buy no cloth that is deficient

\textsuperscript{71} Alexander I. Tchitcherov, \textit{India, Changing Economic Structure in the Sixteenth to Eighteenth Centuries}, pp.52-55.

\textsuperscript{72} \textit{E.F.I. 1618-21}, p.197.

\textsuperscript{73} Ibid. Such examples can be easily multiplied.

\textsuperscript{74} \textit{E.F.I. 1618-21}, p.197.
in length or breadth, and to pay attention to 'the close making and folding up of their broad and narrow baftaes,' . . . [They] have ordered one Ahmadabad 'duttyes and narrow baftaes . . . but with caution that by altering of the weavers' looms they procure the long baftaes to be of equal breadths with those of Baroch, and their duttyes of full yard broad and 12 yards long.'\textsuperscript{75} President Breton reported to the Court of Directors of the English East India Company on 25 January, 1647 that weavers were not averse to changing the size of the looms but their major concern was the prospects of sale of those broad baftas woven according to the East India Company's desired specifications. Breton reports that "these are not entirely satisfactory, either in quality or dimensions; but they cannot hold the weavers to stricter conditions, so unwilling are they to work upon that sort of cloth, which, if, after made, we refuse, remains upon their hands unvendible."\textsuperscript{76} The English Company factors at Ahmadabad reported to the President and Council at Surat on 4\textsuperscript{th} October, 1647, that, "From the specimen of 'puttolaes' sent, they now understand how what the Bantam factors call 'puttola gobars' should be made; but the workemen here, in consideration of the unusual breadth, demand a third more than is paid for the ordinary kind (emphasis added); so, unless they reduce their rates, inquiry will be made at Cambay or

\textsuperscript{75} E.F.I. 1630-1633, p.124.

\textsuperscript{76} E.F.I. 1646-1650, p.78.
Pattan".  Similarly the weavers of Agra and possibly Awadh were not opposed to such alterations for we hear from a report of 6 January, 1648 that says, "Taffetas, such as the patterns forwarded, may be procured in Agra in large quantities, but must be bespoken, as the dimensions are unusual. *The weavers do not object to the breadths required* [emphasis added], but refuse to make pieces more than ‘35 Agra covids-long, which is exactly 8/9ths of a yard, or 32 inches’. For these they demand 1-7/8 and 2 rupees per covid, if the quality is to be that of the Persian patterns, or 1½ rupees, if of the goodness of Agra taffates."  In another report of 31 January, 1649, it is reported that not been able to obtain the quilts and chints desired, but will provide some against next year. "This passed year we have continued a constant residency at Ckandiera, chiefly to induce the weavers by degrees to make their cloth of full dimensions; whereof you will receive a greater quantity than formerly". In the Deccan also, it was found in 1659 that "Calicoes, the factors averred, might be had in large quantities; but the weavers had been so accustomed to making short dimensions only. . .".

In 1663, there was inadequate procurement of textiles from Agra, and the Surat factory was urged to “cause our weavers to weave cloth of

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78. Ibid., pp.189-190.


the dimensions they use to be of; which we have propounded to them, but none will undertake it, except we will first pay for the altering of their looms [emphasis added], and also their own rates, which are so extravagant that we were quite discouraged, especially in regard there were few that would undertake it, they being full of other employments in weaving sundry sorts of goods for the markets of Mocha, Persia, Bussorah, Atchin etc. that, if we do not engage them by impresting moneys beforehand, we should not get half the calicoes we send you." In 1669, it was reported from Bengal that. "the sannoes, gingham, etc. provided about this place cannot be made of lengths and breadths beyond those now sent, unless the price be augmented in a larger proportion than the dimensions; since use and custom amongst the weavers is not to be altered without a charge; they are so tenacious of and addicted to the way they have been brought up in . . .." In 1674 it was reported from Surat that, "the local weaving of cloth for the Company was affected by its preference for broad baftas. Augier explained that there might be difficulties about carrying out this order, as most of the looms in use were for making narrow baftas and it was difficult to alter this."^83

Thus, the independent weavers produced cloth for local and long distance markets, sold it himself, brought about changes in specifications


by charging more money and sold it to the merchants, middlemen and European companies directly. What is still more interesting is that they were not opposed to alterations in the production of textiles.\textsuperscript{84}

Then there are numerous examples of weavers producing textiles on behalf of merchants and European East India Companies. Such organisation of production was necessitated by scarcity or high cost of raw material or requirement of fulfilling certain specifications at fixed rates and supply at stipulated times. In such an arrangement individual artisans or a group of weavers took money in advance on the condition of supplying within stipulated time and at fixed prices. This was possibly the most widely practised method of production. It has drawn the attention of many scholars and has also been discussed in Chapter 9 above.

**Pre-Industrial Manufactories**

The third prevalent form of organisation of production was akin to a manufactory.\textsuperscript{85} Abul Fazl tells us of the manufacture of special kinds of textiles for the use of emperor Akbar in imperial workshops (Karkhanas). Writing about carpets, he says: “His Majesty has caused carpets to be made of wonderful varieties and charming textures; he has appointed experienced workmen, who have produced many masterpieces. The *gilims*

\textsuperscript{84} See also, A.J. Qaisar, *Indian Response to European Technology and Culture*, pp.83-84.

\textsuperscript{85} Marx has traced the features of this mode in *Capital*, I, pp.318-347.
of Iran and Turan are no more thought of, although merchants still import carpets from Goshkan, Khuzistan, Kirman, and Sabzwar. . . . In the imperial workshops single *gilims* are made, 20 *gaz* 7 *tassujes* long, and 6 *gaz* and 11½ *tassujes* broad, at a cost of 1810 rupees, which those who are skilled in the business have valued at 2715 rupees." Thus such an expensive commodity like *gilim* witnessed a reduction in price by 150 per cent. Abul Fazl further writes, "The imperial workshops in the towns of Lahore, Agra, Fatehpur, Ahmadabad, Gujarat, turn out many masterpieces of workmanship; and the figures and patterns, knots, and variety of fashions which now prevail, astonish experienced travellers. His Majesty himself acquired in a short time a theoretical and practical knowledge of the whole trade; and on account of the case bestowed upon them, the intelligent workmen of this country soon improved. All kinds of wool-weaving and silk spinning were brought to perfection; and the imperial workshops furnish all those stuffs which are made in other countries. A taste for fine material has since become general, and the drapery used at feasts surpasses every description."87

Though Abul Fazl does not describe their organization in detail, one can safely assume that they were definitely an exception to from


domestic system of production.

But the imperial workshops did not stand alone. There were private large workshops as well. For example, we have possibly one of the earliest examples of functioning of a workshop in Robert Hughes’ report of 6 August 1620. He reported from Patna, “the cheapest and surest dealing is to buy the serbandy and wind it of myself . . . and at present have thirty men at work thereon, proposing to increase them to a hundred, and if you approve thereof and the price (which is 1/3 cheaper than in Agra), I may have two or three hundred silkwinders to work in the house all the year.” In September 1620 we find Hughes again writing, “I have increased my ‘Cor Conna’ (karkhana) to almost a hundred workmen; but here I will stop until I hear further from Surat.”

Bernier, writing in mid seventeenth century, has described for us these karkhanas in considerable detail. He says, “Large halls are seen in many places, called Kar-kanays (Karkhanas) or workshops for the artisans. In one hall embroiderers are busily employed, superintended by a master. In another you see the goldsmiths; in a third, painters; in a fourth, varnishers in lacquer-work; in a fifth joiners, turners, tailors, and shoemakers; in a sixth, manufacturers of silk, brocade, and those fine muslins of which are made turbans, girdles with golden flowers, and

89. Ibid., p.198.
drawers worn by females, so delicately fine as frequently to wear out in one night. . ..”90

Bernier is also helpful in understanding the nature of supply of labour to these imperial workshops. He writes, “The artisans repair every morning to their respective Kar-kanays, where they remain employed the whole-day; and in the evening return to their homes.”91 This suggests that the artisans did not work in their homes, and therefore the cooperation of the family, available under domestic production, was denied to him in this system.

The condition of artisans working in these manufactories was by no means much better than ordinary artisans. Bernier himself says: “No artist can be expected to give his mind to his calling in the midst of a people who are either wretchedly poor, or who, if rich, assume an appearance of poverty, and who regard not the beauty and excellence, but the cheapness of an article: a people whose grandees pay for a work of art considerably under its value, and according to their own caprice, and who do not hesitate to punish an unfortunate artist, or tradesman, with the korrah, that long and terrible whip hanging at every Omrah's gate.”92 Bernier, however, pointed out that the protection was provided

91. Ibid., p.259.
92. Ibid., p.228.
by powerful patrons to rich merchants and traders who paid higher wages. Still he adds, "I say rather higher wages, for it should not be inferred from the goodness of the manufactures, that the workman is held in esteem, or arrives at a state of independence."³⁹³

Moreover, sometimes the nobility recruited ordinary artisans, working on their own, forcibly for their Karkhanas: "The rich will have every article at a cheap rate. When an Omrah or Mansebdar requires the services of an artisans, he sends to the bazar for him, employing force, if necessary, to make the poor man work; and after the task is finished, the unfeeling lord pays, not according to the value of the labour [emphasis added], but agreeably to his own standard of fair remuneration; the artisan having reason to congratulate himself if the Korrah has not been given in part payment."³⁹⁴

These quotations concerning Karkhanas make it very clear that artisans presumably having acquired specialized skills prior to their employment in Karkhanas, were converted into wage labourers. Their tools used to be simple and they were owners of their tools. The productiveness of such a wage labourer possibly depended on his personal efficiency rather than on the perfection of his tools. Similar tools were used for various purposes. Since in the Karkhanas we do not hear about the emergence of the detailed labourer, there was no urgency for

³⁹³. Ibid.

³⁹⁴. Ibid., pp.255-256.
alterations in implements of artisans working in Karkhanas. In Karkhanas presumably there was no apparent improvement in the instruments of labour. Karkhanas could not therefore create material conditions required for machinery, which is nothing but a combination of simple separate implements driven by a single source of power.

There are a few more references to merchants undertaking production in manufactories. For example Jan van Twist (1634) states that “some banias, who used to earn their livelihood by purchasing and selling alone, have in their houses 40 to 50 looms which belonged to them, which they keep continuously in the work, in order to manufacture all kinds of cloths according to their desire, for that purchase they supply cotton yarn alone to the weavers and workers are paid their wages daily, . . .”

Other examples can be cited from the Dutch East India Company’s efforts to secure the production of silk, bleaching and dyeing of cotton cloths, etc. In 1653 the Dutch East India Company established its small silk reeling building (haspelary). The master reeler was provided with the necessary implements, accommodation for reelers and raw material and he on the other hand was to supply the Company with silk yarn of even quality and of specific weight within a stipulated time. Towards

95. V.O.C. 1113 (K.A. 1025), f.248r.

96. Om Prakash, *The Dutch East India Company and the Economy of Bengal, 1630-1720*, p.113.

97. Ibid.
the end of 1654, the master reeler was in debt (Rs.2,255) to the Company because of undelivered silk.\textsuperscript{98} The reellers were generally paid in advance for producing specific quantity of raw silk and very often they used to desert the place which led to increase in bad debts.\textsuperscript{99} In 1670 a new master reeler Abhay Ram was appointed.\textsuperscript{100} In 1671, it was realised that the expenses had increased by Rs.0.12 to 0.19 per seer of raw silk than what the merchants supplied.\textsuperscript{101} Thus as a consequence Abhay Ram was unable not only to clear the debts of his predecessors but himself became indebted for Rs.1,394/- which the Company eventually condoned.\textsuperscript{102} In 1673, the Company decided to organize the production itself and converted the position of contractor to manager at a salary of Rs.200/- per annum.\textsuperscript{103} The Dutch Company employed 100 reellers in 1675.\textsuperscript{104} But this effort also apparently failed, because in 1681; we hear about the Company's own master reeler Govind Ram (Govindenam), but the Company suffered a huge loss.\textsuperscript{105} The Company terminated his

\textsuperscript{98} Ibid., p.115.

\textsuperscript{99} Ibid.

\textsuperscript{100} Ibid.

\textsuperscript{101} Ibid, p.116.

\textsuperscript{102} Ibid.

\textsuperscript{103} \textit{Generale Missiven, 1675-1685}, IV, p.9.

\textsuperscript{104} Ibid., p.442.

\textsuperscript{105} Ibid.
appointment and appointed another master reeler in his position.\footnote{106}

In order to ensure the adequate supply Jan Pit had contracted with private suppliers to expand their own reeling units and reel the best kind of silk in accordance with the samples.\footnote{107} They were threatened by the Company that if they supplied more than 1700 bales to the English Company then the Dutch Company would stop purchasing from them.\footnote{108}

In the first quarter of 18th century, the Dutch Company contemplated to increase its own production by enhancing the number of reelers up to as large a number as 4000.\footnote{109}

Om Prakash considers the establishment of the Kasimbazar reeling unit by the Dutch as a development of some importance in the emergence of capitalist mode of production in Mughal India. But the Dutch reeling unit did not witness any real development in the direction of decomposition of skilled labour into further branches, specialization of the instruments of labour which is necessary for capitalist organisation of production. At the most it was a gathering of a number of labourers under one shed to ensure security and quality, and not necessarily increased productivity.\footnote{110}

\footnote{106} Ibid.

\footnote{107} Ibid., p.770.

\footnote{108} Ibid.

\footnote{109} Om Prakash, \textit{The Dutch East India Company and the Economy of Bengal, 1630-1720}, p.117.

\footnote{110} Ibid. For the crucial features of European manufactories, see, Marx, \textit{Capital}, I, pp.318-345.
Like the silk reeling unit in Bengal, the Dutch East India Company had also organised bleaching and dyeing units on the Coromandel coast. They had established a blue-dyeing unit at Tegenepatam (Tegnapatam) "where the cotton cloths (which these chiefs hand over according to the proportion (mentioned in general orders) are dyeing at reduced rates because the indigo from south is never so expensive as the northern indigo, which is grown around the quarters of Pale wanze near by Nagel wanze (Naglavancha)."\footnote{Havart, I, p.49; Van Dam, II(2), p.112-13, 156.}

Another dyeing unit was established at Sadraspatam.\footnote{Havart, I, p.93.} A substantial quantity of cloth was dyed there which brought profit every year.\footnote{Ibid.} At Nagelwanze the Dutch Company had a dyeing unit, located in the horse-stable and another one outside the lodge.\footnote{Havart, II, p.44.} At Palakollu, a dyeing unit was functioning in the Dutch lodge.\footnote{Havart, II, pp.44-45; III, pp.5,14,21; Van Dam, II(2), pp.113, 156-157.} By the end of the 17th century we hear of the Dutch dyeing units at Porto Novo and Pondicherry.\footnote{Generale Missiven,1686-1697, V, pp.797, 846.}
Regarding the workers employed in these dyeing units, our sources are reticent. At Palakollu, some twenty two dyers were employed.\textsuperscript{117} They were paid a salary of \(\frac{1}{2}\) pagoda per month which was considered more profitable than paying out daily wages (dagelijix coulijx).\textsuperscript{118} Besides, it was found that at Tegenapatam some weavers, painters and dyers were indebted to the Dutch Company. Their inability to pay back the debt was considered a justification for holding them\textsuperscript{119} presumably to work for the Dutch Company. Interestingly, it is claimed that these poor artisans were satisfied with this.\textsuperscript{120}

The Dutch Company had also established its own bleaching unit at a small village Timmeninepalem, situated in between Nagelwancha and Golconda.\textsuperscript{121} Washers and beaters worked there.\textsuperscript{122} Another bleaching unit was located at Narsapur near Palicol.\textsuperscript{123} In 1674 the Dutch Company

\begin{itemize}
\item \textsuperscript{117} Havart, III, p.21; Van Dam, II(2), p.156.
\item \textsuperscript{118} Van Dam, II(2), p.156. One dyer was paid 2 nevels. One pagoda was divided into 12 fanums and one fanum was divided into 8 to 9 nevels at Palakollu, 9 to 10 nevels at Daatcheron and 10 to 11 nevels at Bimilipatnam, see Van Dam, II(2), p.548.
\item \textsuperscript{119} Van Dam, II(2), p.113.
\item \textsuperscript{120} Ibid.
\item \textsuperscript{121} Havart, II, p.44.
\item \textsuperscript{122} Ibid.
\item \textsuperscript{123} Havart, III, p.17; Van Dam, II(2), p.155.
\end{itemize}
was gifted with an estate at Narsapur and the washers of the place were permitted to work for the Dutch. Each family was to pay 3 pagodas per house to the Diwan. There were four chiefs of the washers and their poll-tax (hoofdgeld) which they gave annually amounted to 500 guilders. Twenty per cent was deducted from their wages. The Dutch Company paid piece-wages to the artisans, not daily wages. In 1676 the washers consisted of 40 families, who living at Masulipatam’s periphery worked in the Company’s garden. They received a farman from the king of Golconda when he visited Masulipatam for the first time in 1676 to free them from the vexations of local officials who used to extort money from them. They were permitted to pay 105 rupees and 8 pagodas in three instalments, mainly for their permitted residence.

125. Ibid.
127. Ibid.
128. Ibid; Van Dam, II(2), p.155 states the charges in terms of local currency. The bleachers charged 1¼ for a piece of fine guinees cloth, 7/8 for common guinees, ¼ for bethilles, 5/16 for salempuris, 2 for parcallas, 1½ pagoda was spent for blue guinees cloth, ½ pagoda for salempuris.
129. Van Dam, II(2), p.149.
130. Havart, I, p.187; see also Van Dam, II(2), p.149. Havart has given the translated text of the said farman.
in and around the Dutch Company’s garden. In case of scarcity of water in the tanks there, they could wash in the tanks outside the nearly village of Suri. The Dutch Company stood as guarantee and received profit on the wages paid for bleaching which was paid to the chief of all the washers.

We hear about another bleaching unit at Daatcheron (Draksharama) where the washers had been granted lease by the governor Kistnappa. They were settled in two tiny villages Golepalen and Gandewaron on lease. But the upper chief (opperhoofden) had proposed to choose another suitable place for establishing the bleaching unit in the territory of another governor called Siombro. Siombro was ready to allow the washers to reside for 30 to 40 pagodas per year. Tegenapatam also had a bleaching unit but it was washed away because of the heavy rainfall and ensuing flood in 1678-79

Thus from this brief survey of the Dutch East India Company’s efforts to organise production in the various segments of textile production

131. Ibid.
132. Van Dam, II(2), p.149.
133. Generale Missiven, 1675-1685, IV, p.293; Van Dam, II(2), pp.158-159.
135. Ibid., pp.290-91.
136. Ibid.
we find that it was not basically different from domestic production. At best they could convert the artisan who was previously an independent or contract producer into a wage labourer. In other essentials, it seemed more a development of the putting out system rather than of capitalist production. In fact it can be argued that the availability of cheap skilled labour obstructed chances of development of capitalistic organization even though there are instances of some enterprising individuals or the Dutch or English East India Companies employing large number of daily wage earners in particular sectors of the textile industry. In none of the instances cited above do we find any employer introducing any improved tool for increasing production, or any technological improvement.

Quantitative Expansion of Textile Production

There is a consensus among scholars that there was substantial expansion of textile production in 16th and 17th centuries.¹³⁷ The large urban market in the Mughal Empire and European trade are held to be the twin factors behind the expansion. So far as the first reason is concerned a study of the share of textiles in the expenditure on the Imperial household explains partly the reason behind the expansion of demand for textiles. Pelsaert had estimated that the imperial stores had cloth to the value of Rs.1,60,13,231/- (woollen cloths valued at Rs.5,03,252; other kinds at

Rs.1,55,09,279). Shireen Moosvi has reduced this by 20 per cent to get the actual expenditure, that is, to get the cost price, and obtained a figure of 1,67,32,193 dams (Rs.4,43,305) for imperial expenditure on cloth alone for 1595-6. Even this amount was not reflective of all expenditure. In each half year (fasl) one thousand suits were prepared for emperor from different varieties of cloth. Of these 120 were kept in readiness throughout the year for conferring robes of honour (khilat). Shireen Moosvi’s suggestion that the actual expenditure was even higher than what Pelsaert had estimated, appears to be correct.

Urban Demand

The next important segment of demand for textiles was generated by the nobles of the empire. The mansabdars’ salary accounted for a very large part of the total effective jama – 81.76 per cent. More than one-third of the jama is estimated to have been spent on craft products. The size of investment on craft products was apparently large, but it did not


139. Ibid., p.262.

140. Ibid.

141. Ibid., p.263.

142. Ibid., pp.270, 273.

143. Ibid., p.293.
necessarily contribute to the production of large quantities of commodities.\textsuperscript{144} It has been pointed out that even this demand for craft products was for goods of high value or rarities.\textsuperscript{145} In other words, there was as yet no “home market, representing an effective demand for large amounts of manufactured goods of moderate value”.\textsuperscript{146} Secondly, many of the articles required by nobles were produced in their own workshops (\textit{karkhanas}).\textsuperscript{147} Still they also purchased finished goods on the market. Secondly, it was not possible for smaller nobles to depend entirely on their own establishments. This is possibly the reason why the markets were full of expensive articles.\textsuperscript{148} Bernier missed the glamour of Parisian shops; but this did not mean that goods were not available: only “here the costly merchandise is generally kept in warehouses, and the shops are seldom decked with rich or showy articles. For one that makes a display of beautiful and fine cloths, silk and other stuffs striped with gold and silver, turbans embroidered with gold, and brocades, there are at least five and twenty where nothing is seen but pots of oil”.\textsuperscript{149} Thevenot

\textsuperscript{144} Ibid., pp.293-94.

\textsuperscript{145} Ibid., p.294.

\textsuperscript{146} Ibid.


\textsuperscript{148} Ibid.

\textsuperscript{149} Bernier, p.248.
(1666) speaking about Cambay observes, "... and the shops are full of Aromatic Perfumes, spices, silken and other stuffs. There are vast number of Ivory Bracelets, Agate-Caps, Chaplets and Rings made in this Town, and these Agates are got out of Quarries of a village called Nimodra ..."\textsuperscript{150} What is also of significance for us is the multiplicity of urban and rural markets\textsuperscript{151} and their capacity to supply expensive commodities for nobles and rich persons including merchants residing in cities and local aristocracy living in rural areas. But the stress was on the production of expensive cloth and other commodities to be sold to these classes. It has been estimated that 15 per cent of the total population possibly lived in towns.\textsuperscript{152} In the central regions of the Mughal Empire, an estimate has been ventured that a family with a size of 4.5 members spent, for bare subsistence, 342.64 dams per annum on food and 212.3 dams on clothing and these along with other expenses amounted for 90 per cent of its total income.\textsuperscript{153} The urban population spent 1,09,94,17,661 dams (Rs.2,74,85,692) on food while on cloth it was about 68,12,64,107

\textsuperscript{150} Thevenot, p.18.

\textsuperscript{151} Cf. Hiromu Nagashima, "Development of Periodic Markets in the Central part of Northern India – Especially during the Mughal Period", in Hiroshi Ishihara, ed., \textit{Markets and Marketing in North India}, Nagoya (Japan), 1991, pp.135-152.

\textsuperscript{152} Shireen Moosvi, \textit{The Economy of the Mughal Empire}, c.1595, p.305.

\textsuperscript{153} Ibid., pp.305-306.
dams (Rs.170,31,602). It has been suggested that the urban population of Akbar’s empire at the end of the 16th century spent around 1,31,85,25,823 dams on food and cloth (Rs.3,29,63,145).

The poorer sections of the urban population also created demand for textiles. The ruling class spent 17 per cent of its income in maintaining unproductive labour; and there was a large section of urban population dependent on service of individual nobles, their troopers and the hangers on. This was partly the reason why Bernier thought that Delhi had the appearance of a camp. In such ‘camp cities’ a substantial population of the artisans and unskilled labourers engaged in producing sundry craft goods, in trade and transport to cater to the needs of aristocrats and rich merchants and others. Thevenot writes, “Broudra (Baroda) is one of the best ... It hath pretty good Walls and Towers, is inhabited by a great many Banians; and seeing the finest stuffs in Guzerat are made in this Town, it is full of Artizans who are continually employed in making of

154. Ibid., p.306.

155. Ibid.

156. Ibid., p.307.


159. Ibid.
A few years earlier Wollebrandt Geleynssen de Jongh had observed about Baroch (Brootchia) that "In this town as well in the villages live people of different origin so Muslims, Hindus, Banias, Khatris as well as Persians who earn their livelihood altogether from weaving, yarn making and purchasing cotton because here a good quantity of cotton cloth is made of varying breadth and fineness . . . also live here the best and fine weavers of cloth . . . ." But the artisans were paid wages sufficient enough to sustain themselves. Per capita productivity was presumably very low in the absence of any advance in technical knowledge. Since the nobility had the requisite wealth to spend on all kinds of luxury goods and therefore was capable of generating demand for long distance trade in high value goods. There was therefore an urban population of substantial size, but possibly less than a sixth of the total population.

The European travellers were particularly struck by their size when compared to towns in Europe. In 1600, there were only three cities in

160. Thevenot, p.44.


163. Irfan Habib, “Potentialities of Capitalistic Development in the Economy of Mughal India”, pp.211-12; also Shireen Moosvi, The Economy of the Mughal Empire c.1595, p.308.

Europe whose population exceeded 200,000 and nine crossing 100,000 population. After a century in 1700 the total population of towns with a population of 5,000 and above in England, Scotland and Wales, did not exceed 13 per cent of the total population. And England by 1700 had largest concentration of urban centres. The city of Agra had possibly the largest concentration of urban population. In 1609, it was around 500,000, by 1629-43 it rose to 660,000 and by 1666 it was estimated to be 800,000. Delhi (1659-66) had a population 500,000, Lahore (between 1581-1615) 400,000 to 700,000, Thatta (1631-1635), 225,000, Ahmadabad (1613), Surat (1663-1700), Patna (1631), Dacca (c.1630) and Masulipatam (1672) had a population of 200,000 each. Shireen Moosvi has further refined this argument by taking into account the size of urban taxation. According to her Agra was the largest city in the empire, and the level of urbanization was fairly high. It had 15


166. Ibid.

167. Ibid.

168. Ibid., p.171.

169. Ibid.


171. Ibid., pp.310, 317 (Appendix 13-A)
flourishing towns. Some of them were manufacturing centres (Fatehpur Sikri, Bayana, Alwar and Gwalior) while other 5 were commercial centres (Chanwar and Dholpur).\textsuperscript{172} Gujarat was the second largest urban tax payer with 13 towns.\textsuperscript{173} Lahore had 12 urban centres, Allahabad had 7, Awadh 2, Delhi 7, Ajmer 5, Malwa 7 urban centres.\textsuperscript{174} This extent of urbanization matches well with the level of urban taxation. Towns in Gujarat contributed 18.73 per cent of the province’s \textit{jama}, and in Agra 15.7 per cent, while in other provinces the ratio hardly touched 5 per cent mark.

**Demand in Overseas Markets**

The other important factor towards expansion of textile production was the arrival of European companies during the sixteenth and seventeenth centuries. The discovery of the Cape of Good Hope created a direct unhindered access to India with significant economic and later political consequences. For India’s export it had an additional significance because India’s trade through Red Sea does not show any sign of decline till the end of the 17\textsuperscript{th} century.\textsuperscript{175} However, the fact that Europe emerged as one

\textsuperscript{172} Ibid.

\textsuperscript{173} Ibid.

\textsuperscript{174} Ibid., pp.310-14.

of the principal markets for both luxuries and craft manufactures of the
world with India being one of major producers for the European market.
India's import of European commodities was not comparable in volume
and value, with what India was exporting. Therefore there was a
problem of payments – which could be solved only by importing silver,
gold and horses till the end of the 16th century. So far as exports are
concerned a major part of Indian exports was constituted by Indian
textiles. Moreland had observed that cotton goods stood out as the “most
conspicuous feature of the trade, though there were some ports exporting
their local produce in a limited way”. Between 1620-1640 the annual
exports of Indian textiles by the Dutch averaged only fl.0.5 million.
But by the early 1650's it crossed fl.2 million mark and reached a figure

176. For imports from Europe or by European companies we do not as
yet have any adequate study. Shireen Moosvi, The Economy of
The Mughal Empire, c.1595, pp.375-381, has tried to estimate
the value of these imports. She is of the opinion that the imports of
spices, excluding pepper into Mughal empire from non-Indian
sources could barely have amounted to a million rupees in value
(ibid, p.380). According to her findings, the main imports of the
Mughal empire were silver, gold and horses. The other items of
import were of relatively little account, “probably accounting for
only a tenth of the total imports, in aggregate” (Ibid., p.381).

177. Shireen Moosvi, The Economy of the Mughal Empire, c.1595,
p.381.

178. Moreland, From Akbar to Aurangzeb, p.54.

179. Om Prakash, European Commercial Enterprise in Pre-colonial
India, p.178.
of fl.2.67 million by 1661-5.\textsuperscript{180} Our assessment on the basis of order lists suggests that from November 1684, there was a steady rise of textiles of Coromandel origin.\textsuperscript{181} It reached its highest level of fl.3.78 million by 1686-90.\textsuperscript{182} These were aggregate values of total annual exports to Europe and Asia.\textsuperscript{183} Out of these, only 20 to 25 percent generally was exported to Europe, whereas South-east Asian markets were major claimants of Coromandel textiles. The value of textiles rose rapidly from around fl.300,000 in 1617 to fl.455,000 in 1626 and fl.824,000 in 1640.\textsuperscript{184} Its value increased to fl. 1.3 million in 1644 and fl. 1.55 million in 1650.\textsuperscript{185} This trend broadly continued till the end of the 17th century when textiles produced in Java and adjacent regions started competing against Coromandel cloth.\textsuperscript{186} In the early 1680's, it was reported that the Javanese had begun to prefer the painted cloth manufactured in their own country

\textsuperscript{180} Ibid.

\textsuperscript{181} See Chapter 10.

\textsuperscript{182} Om Prakash, \textit{European Commercial Enterprise in Pre-Colonial India}, p.178.

\textsuperscript{183} The disaggregation of the value is not possible mainly because the exports for Europe and South-east Asia, were sent to Batavia and listed jointly. See Om Prakash \textit{European Commercial Enterprise in Pre-colonial India}, p.180.

\textsuperscript{184} Ibid., pp.181-182.

\textsuperscript{185} Om Prakash, \textit{European Commercial Enterprise in Pre-Colonial India}, p.182.

\textsuperscript{186} Tapan Raychaudhuri, \textit{Jan Company in Coromandel}, p.162.
to the painted textiles imported from Coromandel. So far as the supply to Amsterdam is concerned, in the last decade of the 17th century, Gujarat had achieved a lead over Coromandel textiles, culminating in the year 1700 in a ratio of 31:15 representing shares in the total orders placed for textiles from Gujarat and Coromandel. 187

So far textiles ordered from Gujarat for Holland is concerned, there was a continuous rise beginning from 56000 pieces in 1681, to 2,28,500 pieces in the next decade in 1691 and remained at 2,25,000 pieces in 1700. 188

Gujarat also exported textiles to the spice islands and Malaya. 189 Gujarat textiles were also greatly in demand in the Middle East – the main emporia being Bandar Abbas and Basra in the Persian Gulf and Mocha in Yemen. 190 It has been estimated that the value of textiles exported to Persia by the Dutch from the mid 1630s fluctuated between around fl.50,000 and fl.150,000 per annum. 191 The gross profit earned on textiles was 40 per cent in 1642 but started declining after that to 4 per cent in 1651 and 7-8 per cent in 1659. Between 1660 and 1670, the trade in

187. See Chapter 10.
188. Ibid.
189. Om Prakash, European Commercial Enterprise in Pre-Colonial India, p.193.
190. Ibid., p.194.
191. Ibid., pp.194.
Gujarati textiles became insignificant and generally accounted for less than 1 per cent of the total Dutch exports from Gujarat.\textsuperscript{192} This very fact that the importance of Persia had declined as a market for Indian textiles and other commodities like indigo and pepper, shows the impact the advent and flourishing of the Europe companies had on India’s “traditional” markets.

So far Bengal, the third and later on the most important region of textile production, is concerned, it had emerged as a major exporter of textiles and raw silk for the European market. It has been estimated by Om Prakash that the average annual value of the Dutch Company’s total exports from Bengal to other parts of Asia as well as to Europe witnessed a rise from fl.200,000 in the late 1640s to over a million florins by 1650.\textsuperscript{193} By the early 1680s it touched a mark of fl.200,000.\textsuperscript{194} Of this, raw silk accounted for 40 per cent of total Dutch exports from Bengal in 1675-6 and textiles for another 22 per cent.\textsuperscript{195} Residual 38 percent comprised saltpetre (12 percent), opium (7 percent) and miscellaneous commodities accounted for the rest.\textsuperscript{196}

\textsuperscript{192} Ibid. It seems that the decline in demand in Persia for textiles from Gujarat was well compensated by rise in demand in Netherlands (see above, p.47)

\textsuperscript{193} Ibid.

\textsuperscript{194} Ibid.

\textsuperscript{195} Ibid.

\textsuperscript{196} Ibid.
Bengal was quite helpful to the Dutch Company in its conduct of trade within Asia. By the 1660s, it contributed 55 to 70 percent of exports to Batavia, Japan and other parts of Asia. In the next decade (1670s) it touched the 80 percent mark. Glamann's comprehensive study of the geographical distribution of piece-goods in return cargoes in 1697 shows that more than half of the textiles reached Holland from Bengal. In 1697 the total import was to the tune of 5.4 million florins, of which approximately 1.75 million florins "or just under one third of the total originated from Bengal."

For the raw silk and textiles from Bengal, there was only a limited market in Europe. Glamann points out that the Court of Directors had reduced the demand for silk from Bengal as early as 1655 by reducing the demand to 100,000 ponds because of falling prices. It declined further in the 1670s and in the beginning of the 1680s to 60,000 to 80,000 ponds. Then with a rise in prices, the demand for Bengal silk

197. Ibid., pp.202-204.

198. Ibid.

199. Glamann, p.144.

200. Ibid.


202. Glamann, p.125

203. Ibid.
passed the level of 1654. The sale of Bengali silk declined. But by the turn of the century, in 1701, the Heeren XVII asked for a total of 285,000 ponds of silk, viz. 40,000 ponds of Chinese silk, 220,000 ponds of Bengali *tanni* and 25,000 ponds of *bariga*. It is interesting to note here that, according to Tavernier, one-third of the Bengal silk was already exported, through the Dutch and the English before 1667, and one-third through Persian and Armenian merchants (part of which also reached Europe presumably through overland transport to the Mediterranean ports and from there to ultimate destination i.e. Europe) and the remaining one-third to be used by Indian weavers. The great silk manufacturers of Gujarat thrived on silk imports from Bengal. Since the technology of silk reeling did not witness any drastic change, an expansion in production to meet the rising demand was a remote possibility, could only take place through expansion of sericulture and labour force.

204. Ibid.

205. Ibid.

206. Ibid, p.126. The war in which Italy was involved for sometime possibly eliminated the greatest supplier of silk in Europe, just as the French War had discontinued the Turkish Trade (see Glamann, p.126.)


208. Tavernier, II.p.2.
After 1670 there was an increase in the interest in cottons and a boom was witnessed in the 1680s.

**Sales of Cottons at Kamer Amsterdam, 1649/50 – 1733/34**

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<tr>
<th>Five Years</th>
<th>Quantities 1000 pieces</th>
<th>Value 1000 florins</th>
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<tbody>
<tr>
<td>1649/50-53/54</td>
<td>208</td>
<td>2,862</td>
</tr>
<tr>
<td>1654/55-58/59</td>
<td>241</td>
<td>2,930</td>
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<tr>
<td>1659/60-63/64</td>
<td>225</td>
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<tr>
<td>1664/65-68/69</td>
<td>214</td>
<td>2,585</td>
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<tr>
<td>1669/70-73/74</td>
<td>357</td>
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<tr>
<td>1674/75-78/79</td>
<td>329</td>
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<tr>
<td>1679/80-83/84</td>
<td>619</td>
<td>4,855</td>
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<tr>
<td>1684/85-88/89</td>
<td>1,119</td>
<td>8,392</td>
</tr>
<tr>
<td>1689/90-93/94</td>
<td>542</td>
<td>5,919</td>
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<tr>
<td>1694/95-98/99</td>
<td>846</td>
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<tr>
<td>1704/05-08/09</td>
<td>819</td>
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<td>1709/10-13/14</td>
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<td>10,715</td>
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<td>1714/15-18/19</td>
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<tr>
<td>1719/20-23/24</td>
<td>1,257</td>
<td>11,259</td>
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<td>1724/25-28/29</td>
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<td>1729/30-33/34</td>
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</tr>
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</table>

Source: Glamann, p.143.

The above table is an eloquent testimony of the fact that the Dutch East India Company had been able to create a big demand for Indian cloth in Holland as well as in other parts of Europe.

Thus the 17th century witnessed a substantial expansion in the value of the Dutch Company’s Asian imports into Europe. Beginning with less
than 3 million over 3 years period between 1619-21, the imports rose to f.15 million during 1698-1700. Simultaneously the composition of imports also underwent significant changes. Pepper and other spices used to account for nearly 74 percent of the total at the beginning of the 17th century and its share was reduced to 23 percent by the end of the century. The share of textiles and raw silk, on the other hand escalated from 16 percent to as much as 55 percent for the same period. The export of indigo occupied a significant space in India’s exports. Biana, Sarkhej and Coromandel coast were the major exporters of indigo besides the indigo from Sind. Indigo from Sarkhej constituted 62.5% of the total demand in 1633. In the next year indigo from Biana relegated Sarkhej to the second position. We have dealt with the relative position of indigo production centres and their share in total export. The Appendix-C makes it very clear that export of indigo continued to retain its significance in India’s exports.

In the case of the English East India Company as well imports of Indian textiles show a rise with the 1660’s. In 1664 the total quantities

209. Cf. Om Prakash, *European Commercial Enterprise in Pre-colonial India*, p.341; see also Glamann, pp.73-111.

210. Om Prakash, p.341.

211. See Appendix C to Chapter 10 alongwith H.W. van Santen, p.148 for supplementing information about indigo from Biana. Our Appendix C takes note of Gujarat and Coromandel’s exports of indigo.
of calico exported by English Company reached more than a million pieces and their value amounted to 73 % of the entire trade of the Company.\textsuperscript{212} According to K.N. Chaudhuri, the first long movement lasted from 1660 to about the middle of the 1680s.\textsuperscript{213} In between there was a temporary break in 1672-3 when the European markets were flooded with East India goods.\textsuperscript{214} But after this brief and small downturn, there was resumption of the upward trend, reaching its peak in 1684.\textsuperscript{215} The total quantities ordered in 1682 had risen to 2.8 million pieces.\textsuperscript{216} The actual imports of Indian cotton piece goods remained low hereafter till 1688-89 because of the Anglo-Mughal war of 1688-89,\textsuperscript{217} which naturally interrupted the exports to England.\textsuperscript{218} Broadly, this trend continued till 1700. So far as the regional distribution is concerned, in 1664, Surat provided 50 percent of the total quantities and 35 percent of the total value of textiles imported into England.\textsuperscript{219} The share of Madras was 41

\textsuperscript{212} K.N. Chaudhuri, \textit{The Trading World of Asia and the English East India Company}, p.282.

\textsuperscript{213} Ibid.

\textsuperscript{214} Ibid, p.285.

\textsuperscript{215} Ibid.

\textsuperscript{216} Ibid.

\textsuperscript{217} Ibid., p.288.

\textsuperscript{218} Ibid., p.290.

\textsuperscript{219} Ibid.
percent of the volume and 48 percent of the value, while that of Bengal was 9 and 17 percent, respectively.\textsuperscript{220} The share of Bengal in total trade continued to remain low till the 1680's, while on the other hand Surat continued to dominate in quantity, though it was Madras which had the largest share in terms of value.\textsuperscript{221} The second boom period was in 1690s when there was an expansion in the demand for textiles. In 1700 the textile imports of the Old Company alone amounted to 868,095 pieces.\textsuperscript{222}

Slavery and European Demand for Indian Textiles

A further factor for the increasing demand for Indian textiles, through the European Companies, was undoubtedly the growth of African slave trade.

The Portuguese initiated a slave trade of their own as early as 1442 by acquiring slaves through raids.\textsuperscript{223} Subsequently the declaration of the second Bull, \textit{Roman Portifex}, 8 January 1455, made its 'legitimacy' more explicit.\textsuperscript{224} Slaves were also acquired by the Portuguese by trading commodities of foreign origin for African slaves.\textsuperscript{225} Besides other

\begin{flushleft}
\textsuperscript{220} Ibid.
\textsuperscript{221} Ibid.
\textsuperscript{222} Ibid.
\textsuperscript{224} Ibid., pp. 21-22.
\textsuperscript{225} Ibid., p.30.
\end{flushleft}
commodities, textiles were imported from England, Ireland, France and Flanders, though some Portuguese manufactured cloths were also used.\footnote{Ibid.}

These slaves were to put to a variety of work in Africa as well as Portugal.\footnote{Ibid., pp.88-89.} So far the Dutch interest in slave trade is concerned, we hear that as early as 11 November 1614, the Governor General Gerard Reynst observed that for many works in Amboina, Banda and Moluccas slaves were needed;\footnote{Generale Missiven 1610-1638, I, pp.44, 122.} and he wrote those who were available, were very valuable and good for working as soldiers or sailors (soldaten off matroosen uit gedaen weesen).\footnote{Ibid.} Reynst wrote that “the Dutch Company should send ships to Madagascar and reach close by island Gion de Nova (Juan de Nova or St. Christophe, island in the strait of Mozambique, west of Madagascar) where at two places Mangelagij (Mangelagy) and Sada (on the west coast of Madagascar in the bay of Bali), there was an abundance of goods, “especially beasts”, at very low costs.\footnote{Generale Missiven 1610-1638, I, p.44.} The commodities which were in demand included cloth manufactured with blue stripes (most likely of Indian origin) like the cloth used by ships’ crew.\footnote{Ibid.} It was reported
that in these places Arabs from the town of Sihir (at the South coast of Arabia) and Kishim as well as from the towns of Pathe (Pata, an island on the east coast of Africa), Lamo, Lanu (situated little south of Pata) and Melinde (Malindi or Melinda) brought cloth from India, along with other goods, taking in exchange not only commodities and money, but also a great number of 'blacks' (Swarten), to the tune of 4 to 5 thousand, every year.\textsuperscript{232} This was their best commodity, purchasing one black for 1½, 2 to 3 rials of eight and some rice.\textsuperscript{233} The slaves were needed for building construction.\textsuperscript{234} Reynst writes that he had already found that one slave performed more work than two or more Dutch men would perform.\textsuperscript{235} They were required also for collection of mace and nutmegs at Pouloway because Ciawers (who performed this work) had left the place.\textsuperscript{236} (Around 1000 slaves for these jobs were brought from the Coromaldel Coast,\textsuperscript{237} and there are continuous references to this source of slave supply, though it is always mentioned that they were purchased in lieu of money). In 1634, many yachts were sent to Africa to procure

\textsuperscript{232} Ibid., pp.44, 50.

\textsuperscript{233} Ibid.

\textsuperscript{234} Ibid., p.46.

\textsuperscript{235} Ibid.

\textsuperscript{236} Ibid., p.72.

\textsuperscript{237} Ibid., p.121.
slaves from the countryside for settling them in Banda. In 1655, Joan Maetsuyker, the Governor General at Batavia had sent 25 leggers (2) of arrak, 20 packs of rice, 18 packs of diverse varieties of cloth and other small provisions for Cape of Good Hope and desired to get rice and 80-100 slaves from there in 1655. In 1657, the price of a slave varied from fl.20 to fl.30-33. It was realized in 1679 that slaves were needed for mining gold and silver in the mines of Salida. In these mines presumably hired labour had proved extremely uneconomic for it was found that total earning from the mine accounted for fl.1322.19.5 in contrast to total expenditure incurred there, i.e. fl.122,667.18.13 between 1671 to 1677. In 1679, 115 slaves were purchased at Madagascar. The request was repeated on 20 April 1681 for purchase of slaves at Madagascar for working mines at Salida. By 1682, 187 male and 138 female slaves were procured to help in mining at Salida. In June 1684, Padang received

238. Ibid., pp.470-71.
242. Ibid.
243. Ibid., p.311.
244. Ibid., p.464.
245. Ibid., p.556.
108 out of 274 slaves from Madagascar. About fl.21864 mostly rials of eight were sent to Madagascar for procurement of slaves. They were successful in obtaining 180 slaves in the Bay of St. Augustin and the Lijvoetsrivier (river Marondava) in lieu of matchlocks/flintlocks (snaphaenen), gun powder and other knick-knacks. On 13 November 1686, 212 slaves were brought to the Cape of Good Hope from Madagascar costing fl.11659 (each slave cost around fl.55), out of which 48 had expired and the rest were sent to Batavia. On 2 September 1687, it was reported that 123 male and 122 female slaves and 31 slaves from Nias were purchased and brought from Madagascar. It seems that these slaves were mostly meant for working in the mines of Salida where 45 whites (blanken) and 510 slaves (swarten) were reported working and together they could extract 14,200 ponds of ore which had fl.23,870 in gold and fl.25,045 in silver. On the other hand it is reported that African slaves were needed for completing the fortification work in Ceylon because of large scale deaths and weakness of slaves of Malabar

246. Ibid. p.726.


248. Ibid., pp.16-17.

249. Ibid., p.144.

250. Ibid., p.136.

and because they were not capable of cutting out the stones.\textsuperscript{252} By 14 January 1695, 37 slaves were purchased at Madagascar at the cost of fl.2384 (slave = 65) and brought to Batavia.\textsuperscript{253} Thus within half a century between 1657 to 1695, the prices of slaves had escalated by no less than 216 to 325 per cent.

It is interesting to note here that in a secret instruction to the master and head of the ship \textit{Hasselt} (1657) it is clearly mentioned that the cotton cloth along with other commodities like cauris, fine coral, iron bars, the best silken stuff, Cyprian cloth was greatly liked and purchased by the king and these were not to be sold to nobles and others.\textsuperscript{254} This is explained as a reason for making slaves expensive.\textsuperscript{255} The importance of Coromandel cloth in slave trade is further attested in the instructions issued by Heeren Bewinthebberen in 1671 in which it was stressed that the cotton textiles presumably from India would be very helpful in procuring slaves.\textsuperscript{256} There appears to be a link between rise in the prices of slaves and escalation in the demand for Indian textiles and especially Negros Cleeden (cloth for

\textsuperscript{252} Ibid., p.370.

\textsuperscript{253} Ibid., p.731.

\textsuperscript{254} Van Dam, II(3), p.535. Similar observations are also made in a Memorial carrying directives for purchasing slaves at the coast of Guinea, see Van Dam, II(3), pp.538-539.

\textsuperscript{255} Ibid., p.535.

\textsuperscript{256} Ibid., p.594.
Negros) and Guinees cloths. An analysis of the orders for these two kinds of cloth shows that these two together far surpassed orders for other cloth from Coromandel coast alone.\textsuperscript{257} These textiles were first sent to Batavia and from there to the Netherlands for its final destination in Africa to purchase slaves. In 1686 alone 4950 packs (97,000 pieces) of Guinees cloth were ordered at the value of fl.890,1000 for the Netherlands.\textsuperscript{258} In addition, 125 packs of Negro-cloths (20,000 pieces) worth fl.37,500 and identical packs of identical numbers coast-cambayen (also an important cloth for African slave trade) worth fl.72,000 were destined for the Netherlands.\textsuperscript{259}

Thus the European trade and its demand for Indian textiles kept on expanding which presumably led to the expansion of production. Unfortunately it is difficult to measure the actual size of the net expansion on the basis of sources available at present. The exports to Europe and South-east Asia under the aegis of the European Companies led to considerable reduction in the relative share of other markets and shift in the importance of other commodities. For example Iran no longer remained the principal market for Indian indigo and chintz. But a relative decline is not the same as absolute decline. It is not clear that the European demand diverted textiles from other markets. If no diversion occurred, then the development of Europe’s trade with India in the seventeenth

\textsuperscript{257} See Chapter 10.

\textsuperscript{258} Van Dam, II(2), p.218.

\textsuperscript{259} Ibid.
century could have had only a positive effect on Indian production.

**Size of Labour Force in Textile Production**

There is no way, as we have just said, of measuring the total increase in textile production over the fifteenth and sixteenth centuries. What we can do is to collect some data from European sources about the number of persons employed in the industry, especially weaving. In 1631-35, Antonio Bocarro estimated that 30,000 looms were operating in Thatta.\textsuperscript{260} This was possibly an error for 3000 because Fremlen and Spiller reported in 1635 that there were 3000 families of weavers at Thatta.\textsuperscript{261} S. Manrique (1640-41) estimated the figure to be over 2000 looms.\textsuperscript{262} It is argued that in 1630’s there must have been at least 12,000 families of weavers @ 4.5 persons per family a total population of 54,000 was engaged in weaving in this small province.\textsuperscript{263}

Similarly Manrique (1640) tells us about Benares, “The City is also very rich on account of the abundance of its merchandise, especially its very fine cotton cloth, which is being woven continually on seven thousand looms in the town itself and in its suburbs.”\textsuperscript{264} If we consider

\textsuperscript{260} Irfan Habib, “Notes on Indian Textile Industry in the 17\textsuperscript{th} Century”, p.187.

\textsuperscript{261} Ibid.


\textsuperscript{263} Irfan Habib, “Notes on Indian Textile Industry in the 17\textsuperscript{th} Century”, p.187.

\textsuperscript{264} Manrique, II, p.147.
each family had one loom and each family consisted of 4.5 persons then it would seem that in 1640 Benares had 7000 families of weavers and a total population of 31,500 was employed in weaving in the city of Benares alone, which would suggest that weaving was one of the major crafts of Benares, and conversely a sizeable section of total population was involved in textile production. In contrast the population of weavers had declined by 1827.265 According to one calculation done for Bengal, it has been argued that the Dutch Company alone accounted for 3.37 per cent and 4.43 per cent of the total work force of 1 million in the textile sector in Bengal.266

There is no doubt that, as we said in the beginning of this thesis, the textile industry in its various branches, constituted a major feature of the Indian economy in the sixteenth and seventeenth century. It created large employment for spinners and weavers in the villages, and was indoubtedly an important engine of urban expansion in Mughal India. It also provided the base for export of textile products, which in turn constituted a major element in the international trade of the times. These facts provide an indispensable backdrop to any serious study of the travails of this industry in colonial times.


APPENDIX-A

ACCOUNT OF SERICULTURE IN INDIA


OBSERVATIONS

CONCERNING THE NATURE OF THE SILK-WORMS

p.599 In *India* the *Silk-Worms* in November are in Eggs 12 Days. Or according to the Natives Account, one *Aggoa*, from which the silk, then made, is called *Aggoued-bund*, and is the best that is made all the year. After twelve Days from the first of November, the Worms are hatch’d, or come out of their Eggs, and are laid upon Matts.

The four first Days after they are laid upon Matts, they give them Mulberry leaves, cut into small thin pieces, to feed upon four times a day, viz. Morning, Noon and at 3 and 9 o’clock.

p.600 The 5th Day they must not be fed at all.

The 6th Day the Worms will be somewhat bigger, and must be fed with big pieces of leaves and that four times a Day, according to the times before mention’d.

The 7th, 8th, 9th, feed them as on the 6th Day.

The 10th Day they must not be fed at all.

The 11th Day they must be fed with larger pieces of leaves, and four times a day, as formerly.

The 12th Day they are to be fed with whole leaves and four times a Day.

The 13th and 14th they must not be fed at all.

The 15th, 16th, 17th 18th, they must be fed with whole leaves, and four times a Day.

The 19th Day, feed them five times, viz., Morning, Noon, at 3 and 9 o’ Clock, and at Mid-night, and continue to feed them so to the 26th inclusive.

p.601 The Worms from about the 14th day will begin to be green, and at the 26th day will be about 2 ¼ inches long.
The 17th Day they will be of a Colour like Yellow and White, and then you must not feed them any more because they begin to spin.

The 28th day, they must be put upon ledges of Matt, fasten’d to a large piece of round Matting, the ledges being about an inch high from the mat and running round like a screw, beginnig at the Center of the Mat, and running round at about a handful or three Inches distance to the circumference. When the Worms are put up to those ledges, they set at Mats leaning in the sun, about 8 in the Morning, and let them stand for 1 ½ Hour; then they put them into the House or Shade, leaning against the Wall; after, at 4 o’clock in the Afternoon, they put them again into the Sun and let them stand till Sun-set; then they put them in the House or Shade, leaning against a Wall, and in this Day and Night’s time, they will have made their Houses.

The 29th Day they take the Worms with their new silk Houses, and put them upon other Mats, flat, without any ledges or partitions, and so lay several Mats upon Frames one over another.

The 30, 31, 32, and 33 days, they spin within their Houses of silk, and then they take each Worm with its House, and shake it at their Ears, and those that are alive, they are good and fit for Breeders, which are kept for such, and those that make no noise are dead, having spun away their Life. Sometimes 1/8, ¼, 1/16 live; sometimes more, and sometimes less; for great Heats and Colds kill many.

The 34, 35, 36, 37th days, they continue spinning.

The 38th day the Worms eat thro’ their Houses, and are like a butterfly; after which they take up their Houses, and put the Worms upon new Mats; the Males they know by their slenderness, and the Females by the contrary, which being plac’d near each other, join; but if there be more of one sort than the other, then after they have done with the lesser number, either.

Males or Females, they join them with the rest, and let them lie all night.

The 30th day they throw away the males.

The 40th the Females lay their Eggs, after which they throw them away likewise. So that the whole Life of these worms, is but 12 days in the Egg, and 40 days out of it; in all 52 Days.

The next silk is made in January; and then the worms are fourteen days in the Egg, and 40 afterwards before they die. This silk is called Maug-Bund, and is the sixth, and worst sort of silk. The making
of it ends about *February* the 14th.

The next is made from *February* the 14th to the 24th of *March*, and is called *Cheita-bund*. The worms stay in the Eggs 8 days, and live 32 days after. This is esteemed the second sort for goodness.

That next is *Sauk-Bund*, esteem'd the fifth sort for Goodness. The Worms stay in their Eggs 8 days, and live 32 days after. The making of this silk ends about the 6th of *May*.

The next is *Assoree-Bund*, esteem'd the 4th sort for Goodness. The worms continue in the Eggs and die, as the two last sorts. And the making of the silk ends about the 4th of *June*.

The next is *Sowaud-Bund*, and is esteem'd the third sort. The making of this also ends about the last of *July*.

In *August* and *September* no silk is made, and but very little in *October*.

This is the Nature of the *Silk-worms* in the *Indies* where the Heat of the Sun renders them much more fruitful than with us; for in *India* the Worms breed and spin their silk six times in the year, and in *England*, only once, because here they remain in the Egg from the latter end of *August* 'till about the latter end of *May*. There likewise they are sooner brought to perfection, and begin to work sooner, *viz.* 28 days after they are hatcht, but in *England* not 'till the 40th. Where also they are by a third part more tedious in breaking out of their Houses, from the first day of their spinning than in the *East*, which is there done in ten days, but here only in fifteen.

The *Silk-worm* derives its Birth from the seed of the *Butterfly*, which is as small as the Heads of Pins, and does somewhat resemble Rape-seed, being flatted on both sides. This Insect, by whose Industry we have the Silk, which is spun out of its Bowels, and artificially formed by its mouth into the Fashion of a Clew, differs not very much from a Caterpillar, either in the Shape or Bulk, baiting that this is more Hairy, and its web is weaker and of another Colour. And yet for want of Mulberry-Leafs (which is the most proper food for the Silk-Worm), when they are forc'd to subsist by the leaves of the Rose-Bush, Lettice, or some others (which sometimes are made use of) this Nourishment either weakens the Thread they spin, and makes it as useless as that of the Caterpillars, or else they will not work at all. But that which seems most remarkable and wonderful in this Animal, is its change of shape, and one would think.
## APPENDIX-B

<table>
<thead>
<tr>
<th>S.No</th>
<th>Date &amp; Year</th>
<th>Place</th>
<th>Names</th>
<th>Remarks</th>
</tr>
</thead>
</table>
| 01.  | 17 Apr 1665 | Nagapatinum (17) & Nagore | 1) Chianwana  
2) Ancckena  
3) Trewenge lan  
4) Deuweray  
5) Warredam  
6) Kowanday  
7) Algapa  
8) Narynapa  
9) Peddoi  
10) Mayla  
11) Deweray Poule  
12) Coupeen  
13) Mondou Chitty  
14) Windy nyna  
15) Chinapandarem  
16) Armen  
17) Anckena  
18) Pellere  
19) Ilapa  
20) Mallere |
| 02.  | 24 Apr 1665 | Trimelepnam | 1) Modda Wingeratri Chitty  
2) Kalastra chitty  
3) Orenida(?) Chitty,  
4) Kalapoa  
5) Wengetadrij  
6) Nagapa chitty  
7) Ire Chitty,  
8) Tanne Pille  
9) Wenderanem  
10) Teerawana chitty  
11) Wengetadaeri chitty  
12) Perre ammetic  
13) Perie tamly chitty  
14) Nyna tain modety chitty  
15) Siogo wandy chitty  
16) Dathie chitty  
17) Ariappa |
| 03.  | 24 Apr 1665 | Tammelepnam | 1) Kistna chitty  
2) Perye Saary chitty  
3) Tuce chitty  
4) Allegatre chitty  
5) Waalo chitty  
6) Salwande chitty  
7) Sannij Chitty  
8) Sanne poulie |
9) Ura chitty
10) Mommo chitty
11) Kayaly ure chitty
12) Kowala chitty
13) Meela trimele chitty
14) Chinatace chitty
15) Smgerj chitty
16) Wedammlele
17) Sungema chitty
18) Nangoure Wellee
19) Balapatte
20) Wali tadri wandy
21) Kommerj
22) Titarj
23) Narain poule
24) Kelloernage chitty
25) Tittere
26) Katiaale
27) Mooreiyeke
28) Kottemyna
29) Sorre Wengetratri
30) Scamgamma chitty
31) Kalastre chitty
32) Koenepa chitty
33) Walewareddde
34) Wengeredde cherijck
35) Wengeratri
36) Tamoelewante chitty
37) Kalapa chitty
38) Poelspiama (?)
39) Ritty Nagapa
40) Koujee chitty
41) Jillepe ur Wengeratri
42) Kondere Wengeratni
43) Saria poule
44) Perimmele Japouls
45) Wiera kouty Tiagapa
46) Nelle peramme
47) Pape chitty
48) Wengetratri mele (?)
49) Inlakaepo chitty
50) Wiera chitty
51) Karraejee
52) Nagoarure chitty
53) Nagoer Lagenna
54) Ain alche
55) Bedanerj
56) Amelgen Nieuta (?)
57) Chitty grejea
58) Wille poule wande
59) Cutue wingeralaj
<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Weavers</th>
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| 27 Apr 1665| Porwechery    | 1) Andiapa  
2) Citteambelon  
3) Perintourea  
4) Cilambannode  
5) Montatie  
6) Korinde  
7) Wandatsie  
8) Chtewanda  
9) Kannemlee  
10) Cettapen  
11) Aiyen pourmal  
12) Cingepourmal  
13) Petacouty |
| 27 Apr 1665| Mansiecoule   | 1) Pieteconty  
2) Leisiemende  
3) Teleimmenade  
4) Jawaharrea  
5) Tayla  
6) Celambraan  
7) Angie moddely  
8) Schiawerrij nellen  
9) Schienouweat  
10) Kosty moddely  
11) Manary |
| 4 May 1665  | Nagapattinum  | 1) All weavers  
2) Sammaga chitty  
3) Tiremde chitty |
| 4 May 1665  | Trimelepatnam | 1) All Koikola  
2) Weavers  
3) Kasta |
| 4 May 1665  | Trimelepatnam | 1) Kasta  
2) Schiena (?) |

### APPENDIX-C

**INDIGO**

*(WEIGHT IN DUTCH POUNDS)*

<table>
<thead>
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<th>Gujarat order sent</th>
<th>Coromondel</th>
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</tr>
<tr>
<td>Indigo Lauro</td>
<td>90,000</td>
</tr>
<tr>
<td>Indigo Circhees</td>
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</tr>
<tr>
<td></td>
<td>240,000</td>
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## APPENDIX-E

(TEXTILES FROM COROMANDEL)

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<td></td>
<td></td>
<td>(4.32%)</td>
<td>(0.36%)</td>
<td>(1.22%)</td>
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## APPENDIX-F
### (TEXTILES FROM COROMANDEL TO CEYLON)

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<th>S. No.</th>
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<th>Painted Chits from Tutucurin</th>
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<th>Pieremoenen-moelen’s Catches</th>
<th>Salempuris from Tutucurin</th>
<th>Ternatads Bethilles</th>
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# APPENDIX G  
## (BAFTAS)

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<td>Witte Smale Baftas Van Suratte</td>
<td>2,000 Blaue Baftas</td>
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<td></td>
<td>2,000 Coromandelse baftas Swarte</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,000 Coromandelse bruin blaeuwe</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>2,000 Coromandelse baftas Swarte</td>
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<td>1,000 Coromandelse bruin blaeuwe</td>
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<td>2,000 Coromandelse baftas Swarte</td>
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</table>
## APPENDIX-H
### COTTON YARN

<table>
<thead>
<tr>
<th>Order sent in</th>
<th>Gujarat</th>
<th>Coromandal</th>
<th>Others</th>
<th>Unidentified</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>17 Sept. 1633</td>
<td>200 bales</td>
<td>200 bales</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>25 Aug. 1634</td>
<td>-</td>
<td>-</td>
<td>400 bales</td>
<td>-</td>
<td>Mostly of Surat which is very well coveted.</td>
</tr>
<tr>
<td>12 Sept. 1635</td>
<td>-</td>
<td>-</td>
<td>400 bales</td>
<td>-</td>
<td>&quot;</td>
</tr>
<tr>
<td>24 Sept. 1636</td>
<td>-</td>
<td>-</td>
<td>60,000 lb.</td>
<td>-</td>
<td>From Surat as well as Coromandal but of Surat is well coveted.</td>
</tr>
<tr>
<td>9 Sept. 1638</td>
<td>-</td>
<td>-</td>
<td>40,000 lb.</td>
<td>-</td>
<td>&quot;</td>
</tr>
<tr>
<td>23 Sept. 1639</td>
<td>-</td>
<td>-</td>
<td>50-60,000 lb.</td>
<td>-</td>
<td>&quot;</td>
</tr>
<tr>
<td>18 Sept. 1640</td>
<td>-</td>
<td>-</td>
<td>50-60,000 lb.</td>
<td>-</td>
<td>&quot;</td>
</tr>
<tr>
<td>6 Sept. 1641</td>
<td>-</td>
<td>-</td>
<td>50-60,000 lb.</td>
<td>-</td>
<td>&quot;</td>
</tr>
<tr>
<td>22 Sept. 1643</td>
<td>20,000 lb.</td>
<td>10,000 lb.</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>29 Nov. 1642</td>
<td>30,000 lb.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>In case of lack of it, it should be supplemented by that of Coromandal a 9 stuiver a lb.</td>
</tr>
<tr>
<td>28 Aug. 1642</td>
<td>20-25,000 lb.</td>
<td>None</td>
<td>-</td>
<td>-</td>
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<tr>
<td>17 Sept. 1644</td>
<td>25,000 lb.</td>
<td>None</td>
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<td>4 Sept. 1645</td>
<td>50-60,000 lb.</td>
<td>None</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>7 Aug. 1646</td>
<td>60,000 lb.</td>
<td>None</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>8 Nov. 1647</td>
<td>80,000 lb.</td>
<td>None</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>22 Sept. 1648</td>
<td>80000 lb.</td>
<td>None</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>17 Sept. 1649</td>
<td>80000 lb.</td>
<td>None</td>
<td>-</td>
<td>-</td>
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<tr>
<td>8 Sept. 1650</td>
<td>80,000 lb.</td>
<td>None</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>7 Oct. 1656</td>
<td>80,000 lb.</td>
<td>None</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Date</td>
<td>Quantity</td>
<td>Origin</td>
<td>Notes</td>
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<td>------------------------------------------------</td>
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<tr>
<td>6 Oct 1657</td>
<td>100,000 lb.</td>
<td>None</td>
<td>-</td>
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<tr>
<td>29 Aug 1658</td>
<td>80,000 lb.</td>
<td>None</td>
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<tr>
<td>3 Sept 1659</td>
<td>70,000 lb.</td>
<td>None</td>
<td>-</td>
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<td></td>
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<tr>
<td>16 Aug 1660</td>
<td>80,000 lb.</td>
<td>None</td>
<td>6,000 lb. - Red cotton yarn (?)</td>
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<tr>
<td>30 Sept 1661</td>
<td>80,000 lb.</td>
<td>None</td>
<td>- 3-4,000 red cotton yarn as number</td>
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<tr>
<td>16 Sept 1662</td>
<td>40,000 lb.</td>
<td>None</td>
<td>50,000 lb. From Winguria</td>
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<tr>
<td>23 Aug 1663</td>
<td>40,000 lb.</td>
<td>None</td>
<td>50,000 lb. From Winguria</td>
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<tr>
<td>6 Oct 1664</td>
<td>50,000 lb.</td>
<td>None</td>
<td>30,000 lb. From Winguria</td>
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<tr>
<td>6 Nov 1665</td>
<td>50,000 lb.</td>
<td>None</td>
<td>25,000 lb. From Winguria</td>
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<tr>
<td>01 Oct 1666</td>
<td>37,500 lb.</td>
<td>None</td>
<td>37,500 lb. From Winguria</td>
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<tr>
<td>18 Nov 1667</td>
<td>33,335 lb.</td>
<td>66,665 lb.</td>
<td>- 12,000 lb.</td>
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<tr>
<td>21 Aug 1668</td>
<td>33,335 lb.</td>
<td>66,665 lb.</td>
<td>- 10,000 lb.</td>
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<tr>
<td>22 Aug 1669</td>
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<td>20,00 lb.</td>
<td>20,000 lb. Winguria</td>
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<td>2 Sept 1670</td>
<td>10,000 lb.</td>
<td>10,000 lb.</td>
<td>- 12,000 lb. Winguria</td>
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<tr>
<td>20 Aug 1671</td>
<td>20,000 lb.</td>
<td>60-70,000 lb.</td>
<td>20,000 - Winguria</td>
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<td>29 Sept 1672</td>
<td>10,000 lb.</td>
<td>20,000 lb.</td>
<td>10,000 lb. Winguria</td>
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<tr>
<td>3 Nov 1673</td>
<td>10,000 lb.</td>
<td>6000 lb.</td>
<td>6000 lb. Winguria</td>
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<td>1 Nov 1674</td>
<td>10,000 lb.</td>
<td>20,000 lb.</td>
<td>6,000 lb. Winguria</td>
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<tr>
<td>27 Sept 1675</td>
<td>4,000 lb.</td>
<td>10,000 lb.</td>
<td>6,000 lb. Winguria</td>
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<tr>
<td>20 Oct 1676</td>
<td>2,000 lb.</td>
<td>-</td>
<td>6,000 lb. Winguria</td>
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<tr>
<td>8 Oct 1677</td>
<td></td>
<td>-</td>
<td>6,000 lb. Bengal</td>
<td></td>
<td></td>
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<tr>
<td>28 Oct 1678</td>
<td></td>
<td>-</td>
<td>6,000 lb. Bengal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>Weight</td>
<td>Details</td>
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<tr>
<td>14 Nov. 1679</td>
<td>-</td>
<td>6,000 lb.</td>
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<td>28 Oct. 1680</td>
<td>10,000 lb.</td>
<td>Winguria</td>
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<tr>
<td>20 Nov. 1681</td>
<td>6,000 lb.</td>
<td>Tuticurin, Bengal</td>
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<tr>
<td>19 Dec. 1682</td>
<td>4,000 lb. 6,000 lb.</td>
<td>Tuticurin, Bengal</td>
<td></td>
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<tr>
<td>29 Nov. 1683</td>
<td>6,000 lb. 8-10,000 lb. 6,000 lb.</td>
<td>Tuticurin, Bengal</td>
<td></td>
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<tr>
<td>9 Dec. 1684</td>
<td>6,000 lb. 10,000 lb. 6,000 lb.</td>
<td>Tuticurin, Winguria</td>
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<tr>
<td>1 Oct. 1685</td>
<td>6,000 lb. 6,000 lb. 10,000 lb. 6,000 lb. 6,000 lb.</td>
<td>Bengal, Tuticurin, Winguria</td>
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<tr>
<td>25 Oct. 1686</td>
<td>6,000 lb. 6,000 lb. 10,000 lb. 6,000 lb. 6,000 lb.</td>
<td>Tuticurin, Winguria</td>
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<tr>
<td>5 Nov. 1687</td>
<td>6,000 lb. 6,000 lb. 10,000 lb. 6-8000 lb. 6,000 lb.</td>
<td>Bengal, Tuticurin, Winguria</td>
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<tr>
<td>26 Nov. 1688</td>
<td>10-15,000 lb. 6,000 lb. 5-6,000 lb. 6,000 lb. 6,000 lb.</td>
<td>Tuticurin, Winguria</td>
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<tr>
<td>9 Dec. 1689</td>
<td>10-15,000 lb. 6,000 lb. 10,000 lb. 6,000 lb. 6,000 lb.</td>
<td>Bengali, Winguria, Tuticurin</td>
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<tr>
<td>14 Dec. 1690</td>
<td>10-15,000 lb. 8-10,000 lb. 10,000 lb. 8-10,000 lb. 6,000 lb. 8000 lb.</td>
<td>Bengal, Tuticurin, Winguria</td>
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<tr>
<td>8 Dec. 1691</td>
<td>10-15,000 lb. 8-10,000 lb. 10-15,000 lb. 20-25,000 lb. 6-8,000 lb.</td>
<td>Bengal, Tuticurin, Winguria</td>
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<td>6 Dec. 1692</td>
<td>10-15,000 lb. 8-10,000 lb. 15,000 lb. 6,000 lb.</td>
<td>Bengal</td>
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<tr>
<td>Date</td>
<td>Weight (lb.)</td>
<td>Port</td>
<td></td>
<td></td>
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<td>--------------</td>
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<tr>
<td>18 Nov. 1693</td>
<td>10-15,000</td>
<td>Tuticurin</td>
<td></td>
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<tr>
<td></td>
<td>8-10,000</td>
<td>Winguria</td>
<td></td>
<td></td>
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<tr>
<td>11 Maart 1694</td>
<td>10-15,000</td>
<td>Bengal</td>
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<tr>
<td>8 Nov. 1694</td>
<td>-</td>
<td>-</td>
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<tr>
<td>21 Maart 1695</td>
<td>10-15,000</td>
<td>Bengal</td>
<td></td>
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</tr>
<tr>
<td>5 Dec. 1695</td>
<td>15,000</td>
<td>Tuticurin</td>
<td></td>
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</tr>
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<td></td>
<td>8-10,000</td>
<td>Java</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27 Maart 1697</td>
<td>-</td>
<td>Java</td>
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<td></td>
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<tr>
<td>24 July 1698</td>
<td>5-6,000</td>
<td>Java</td>
<td></td>
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<td>6 Maart 1699</td>
<td>-</td>
<td>Java</td>
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<td>17 Feb. 1700</td>
<td>20,000</td>
<td>Java</td>
<td></td>
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### APPENDIX-I

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<th>Year</th>
<th>Name of the merchants/Dalas/Weavers</th>
<th>Place</th>
<th>Amount of the Contract (Rs.)</th>
<th>Reference</th>
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<tr>
<td>29 April 1680</td>
<td>Weavers of Chandanis</td>
<td>Malda</td>
<td>15,000.00</td>
<td>&quot;Makda Diary &amp; Consln&quot; p.9</td>
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<tr>
<td>29 April 1680</td>
<td>Weavers of Sazzies Or Oungshies</td>
<td>Malda</td>
<td>7,660.00</td>
<td>&quot;Makda Diary &amp; Consln&quot; p.9</td>
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<td>29 April 1680</td>
<td>Weavers of Elatches</td>
<td>Malda</td>
<td>5,547.00</td>
<td>&quot;Makda Diary &amp; Consln&quot; p.9</td>
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<tr>
<td>29 April 1680</td>
<td>Weavers of Nehallewars</td>
<td>Malda</td>
<td>4,500.00</td>
<td>&quot;Makda Diary &amp; Consln&quot; p.9</td>
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<td>29 April 1680</td>
<td>Weavers of Charcoonaes</td>
<td>Malda</td>
<td>3,000.00</td>
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<tr>
<td>29 April 1680</td>
<td>Weavers of Seersuckers</td>
<td>Malda</td>
<td>1,710.00</td>
<td>&quot;Makda Diary &amp; Consln&quot; p.9</td>
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<td>7 May 1680</td>
<td>Shripal Dalal</td>
<td>Malda</td>
<td>3000.00</td>
<td>&quot;Makda Diary &amp; Consln&quot; p.9</td>
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<td>7 May 1680</td>
<td>Muniram Dalal &amp; Weavers</td>
<td>Malda</td>
<td>1,000.00</td>
<td>&quot;Makda Diary &amp; Consln&quot; p.9</td>
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<td>Muniram Dalal</td>
<td>Malda</td>
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<td>Malda</td>
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<td>Malda</td>
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<td>Malda</td>
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<td>&quot;Makda Diary &amp; Consln&quot; p.54</td>
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<td>Malda</td>
<td>500.00</td>
<td>&quot;Makda Diary &amp; Consln&quot; p.59</td>
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<td>7 May 1680</td>
<td>Muniram Dalal</td>
<td>Malda</td>
<td>50.00</td>
<td>&quot;Makda Diary &amp; Consln&quot; p.59</td>
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<td>7 May 1680</td>
<td>Muniram Dalal</td>
<td>Malda</td>
<td>2,475.00</td>
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<td>7 May 1680</td>
<td>Muniram Dalal</td>
<td>Malda</td>
<td>315.00</td>
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<tr>
<td>7 May 1680</td>
<td>Muniram Dalal</td>
<td>Malda</td>
<td>1,740.00</td>
<td>&quot;Makda Diary &amp; Consln&quot; p.59</td>
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<tr>
<td>7 May 1680</td>
<td>Muniram Dalal</td>
<td>Malda</td>
<td>450.00</td>
<td>&quot;Makda Diary &amp; Consln&quot; p.59</td>
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<tr>
<td>7 May 1680</td>
<td>Muniram Dalal</td>
<td>Malda</td>
<td>450.00</td>
<td>&quot;Makda Diary &amp; Consln&quot; p.59</td>
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<tr>
<td>7 May 1680</td>
<td>Muniram Dalal</td>
<td>Malda</td>
<td>550.00</td>
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<td>Malda</td>
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<td>7 May 1680</td>
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<td>Malda</td>
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<tr>
<td>Year</td>
<td>Name of the merchants/Dalals/Weavers</td>
<td>Place</td>
<td>Amount of the Contract (Rs.)</td>
<td>Reference</td>
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<tr>
<td>--------------</td>
<td>--------------------------------------------</td>
<td>--------------------</td>
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<tr>
<td>14 Aug. 1680</td>
<td>Shripal dalal</td>
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<td>1,057.00</td>
<td>&quot;Molda Diary &amp; Consin&quot; pp.62, 66</td>
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<tr>
<td>16 Aug. 1680</td>
<td>Ghanshyamdas to provide Tanjeebs, Mimal from</td>
<td>Shahbazpur</td>
<td>1,000.00</td>
<td>&quot;Molda Diary &amp; Consin&quot; p.62</td>
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<td>1,223.00</td>
<td>&quot;Molda Diary &amp; Consin&quot; p.64</td>
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<td>450.00</td>
<td>&quot;Molda Diary &amp; Consin&quot; p.66</td>
</tr>
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<td>Ghanshyamdas</td>
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<td>&quot;Molda Diary &amp; Consin&quot; pp.68, 70</td>
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29 Aug. 1682 | Shambhoonath on 400 ps of Mullmulls |  | 2,850.00 | "Malda Diary & Consbn" p.193
1 Sept. 1682 | Jessodunundun (Yashodananda and Soodanud on Cossaes) |  | 3,000.00 | "Malda Diary & Consbn" p.199
29 Sept. 1682 | Weavers of Chandanis |  | 1,680.00 | "Malda Diary & Consbn" p.199
Weavers of Orungshies |  |  | 403.00 | "Malda Diary & Consbn" p.199
Weavers of Charconnaes |  |  | 420.00 | "Malda Diary & Consbn" p.199
Weavers of Elatches |  |  | 239.00 | "Malda Diary & Consbn" p.199
Total: |  |  | **2,742.00** | 
5 Oct. 1682 | Weavers of Rumals |  | 925.00 | "Malda Diary & Consbn" p.208
5 Oct. 1682 | Shambhoonath |  | 2,000.00 | "Malda Diary & Consbn" p.208
24 Oct. 1682 | Shambhoonath |  | 750.00 | "Malda Diary & Consbn" p.208
24 Oct. 1682 | For Mullmulls |  | 437.00 | "Malda Diary & Consbn" p.208
APPENDIX-J
A DUTCH MEMOIR OF 1603 ON INDIAN TEXTILES

The importance of textile production in the Mughal period was well underlined by Moreland. This is especially true of silk, cotton and wool industries. Textiles had few rivals among other industries, none of which could compete with them in terms either of their contribution to the national product or of geographical diffusion.

It is, then, of some interest that there exists a Dutch ‘Memorie’, dated November 1603, prepared by Stalpaert van der Wiele, on the kinds of textile products, especially such as were expected to find a market in South-east Asia on the basis of exchanged with spices.

The Memoir lists the following commodities:

(1) ‘Cayn Tourias’ (Kain Turia), coarse printed/dyed cotton cloth. Generally, thise had a length of 3 fathoms and width of 4 spans. Some times they were dyed with red or green stripes, roses or round ‘daalders’. The red were known as ‘Tourias Meera’ in Malaya and were much in demand. The green coloured were called ‘Tourias Itchu’ and were purchased for 3 or 4 Rials per corge (i.e. 20 pieces) and were sold in


2. Memorie van November 1603 over den toenmaligen handel, voornamelyk met lijnwaden, in Voor Indie, uitgezonderd Cambay en Chaul (Tjasel), op het Maleische Schiereiland, en in den Maleishe Archipel. The original is to be found under ‘Kamer van Zeeland 41 G’ in the Algemeen Rijksarchief, s-Gravenhage, The Netherlands. On the parchment is written, ‘Artikelen ende Instruction op de Schepen’. The whole Memorie has been carefully reproduced in G.P. Rouffaer and H.H. Juynboll, De Batikkunst in Nederlandsch-Indie en haar Geshiedenis, Utrecht, 1914, Bijlage III, pp.xi-xxv. This was partly published by J.K. J. de Jonge, ed. De Opkomst van het Nederlandsch Gezag in Oost Indie, 1595-1610, III, ’s-Gravenhage/ Amsterdam, 1875, p.149. F.W. Stapel has used this Memorie in explaining some textile terms in Van Dam, (relevant volumes). Tapan Raychaudhuri, Jan Company in Coromandel, 1605-1690. A Study in the Interrelations of European Commerce and Traditional Economies, s-Gravenhage, 1962, Appendix C, pp.221-22, has made use of this memoir to elucidate some varieties of Coromandel cloth.
Banda for 150 to 200 ‘catti’ nutmegs.  

(2) ‘Baftas’ (baftas), purchased for ¾ to 5/4 Rial per piece and in Banda fetching 40 to 80 catti nutmegs. 

(3) Carycam, red and blue cloths: red were much in demand, 20 pieces being sold for 8 to 10 Rials, and blue for 7 to 8. In Banda they fetched 10 to 20 Catti nutmegs. 

(4) Osinani (Osmani) (asmani) a coarse cloth: could be purchased for 3-4 Rials (5) camykyn (Canykyn) (Kannekin), white cotton cloth, length 7 & 8 fathoms, sold for 1 ¾ to 1 ½ Rials; could procure 30 to 35 ‘catti’ nutmegs in Banda.

(6) ‘Mecanis’, finer than Canikins’, but slightly more expensive. 

(7) Tajauanis’ (chaveni), white cotton cloth but smooth, 5 fathoms long and 2 spans wide and sold for 4 to 6 Rials per 20 pieces; fetched in Banda 25 to 40 ‘catti’ nutmegs. 

(8) ‘Tschyndes’ (Chindis) (Chintz), a multi-coloured (Bonte) silk cloth, sold in Banda for 40-50 ‘catti’ nutmegs per piece. These were sent to Arabia and Persia to be sold in exchange for silver and gold. 

Since St. Thome and Mylapore were under Portuguese control, the dutch procured their supplies of cloth from places like Calliture and Armagon, the procurements being controlled from Paleacat. The sorts listed are as follows: 

(9) ‘Dragons’, with two colours either red and white, red and green or red and blue. They were sold for 130 and 150 Rials per ‘basta’ which consisted of 160 pieces. 

(10) ‘Pattas’, also called ‘Tschemalleyas’. This was woven red or green for about half fathom, and further in the middle had red or blue stripes. It was sold for 13 to 16 Rials per corge, and fetched 30 to 45 ‘catti’ of nutmegs in Banda. 

(11) Tapisarassi (Tapi Sarassa), painted cloths with figures of foliage or birds and purchased for 10 to 13 Rials per corge, 25 to 30 ‘catti’ of nutmegs (in Banda). 

(12) ‘Sarasses tsechramalais’, the best and smoothest, and fetched 60 to 70 Rials per corge. The lesser quality could fetch 40 to 50 Rials and 50 to 90 ‘catti’ nutmegs (in Banda). Similarly, (13) ‘Sarassa gobaer’, purchased for 70 to 80 Rials per corge. 

(14) ‘Tschelleyes’, (chelas) (shela) were white checkered cotton textiles with black stripes. 

From Nagapatnam the following cloths could be procured for trade in Banda, Amboina, Seeram and other places: 

(15) ‘Salalous’ (Sallalos), black and dark blue cloths, purchased for 6-8 Rials per corge. 

(16) ‘Balatscher’ (Ballatios), white, black and blue cloths, purchased for 15-17 per corge: these fetched nutmegs according to the quality of the cloth. 

(17) ‘Poleng’ (Pelong), 2-3 fathoms long and 5 spans wide, purchased for 12-15 Rials per corge. 

(18) Touloupoucan (Tulupucan), 1 ½ fathoms long and 4 ½ spans wide, purchased for 6-7 Rials per corge, and 10,11,

3. ‘Memorie van 1603’, p.xi. 

4. Ibid.
or 12 pieces fetched in Banda 1 *baar* of nutmegs.

Masulipatnam provided: (20) ‘Mouryn’ (*Mui*), 4 fathoms long, a cheap striped cotton cloth, of two qualities, purchased for 10 Rials per corge; 6-8 pieces fetched *bahar* of nutmegs in Banda. (21) Soutars (*Chautars*), 7-8 fathoms long, purchased for 20-25 Rials per corge; 1-5 pieces could procure 30-40 catti nutmegs. (22) Salimpournis (*Salempuris*), 8 fathoms long, white cotton cloth, bordered with red stripes, purchased for 25-30 Rials per corge, fetched in Banda 30-40 catti nutmegs. (23) ‘Cayn Mogo’ (*Kain Mogo*), yellow cotton cloth in the Malaya style, 2 fathoms long and 3 ½ span wide, purchased for 8 Rials per corge, and 1 corge sold for 1 ½ *baar* nutmegs. (24) ‘Pattamalam’, 2 fathoms long and 5 spans wide, purchased for 10-12 Rials per corge; 1 corge could procure 2-4 *baar* nutmegs. (25) ‘Cain Mandil’ (*Kain Mandil*), blue cloth with white stripes, 1 ½ fathoms long and 4 spans wide, purchased for 7-8 Rials per corge; 2 pieces sold for 10-20 catti nutmegs in Banda; (26) Distaers (dastar), red dyed cotton cloth, 3 fathoms long and 3 ½ spans wide, purchased for 8 Rials per corge, and a corge sold for 1 ½ ‘baar’ nutmegs. (27) ‘Cain Coobaer’ (Main Gover), cotton cloth of ‘brownish blue with whitish blue stripes’, 1 ½ fathoms long and 5 spans wide, could be purchased for 13-14 Rials per corge; in Banda sold 10 pieces for 1 ‘baar’ nutmegs. (28) ‘Cassiopes’, half cotton, half silk, striped cloth, 4 fathoms long ad 5 spans wide, purchased for 30-35 Rials per corge and sold in Banda a piece for 40-50 ‘Cattis’ nutmegs.

From Bengal came: (29) ‘Sattou pacooras’, white cotton cloths, 6-6 ½ fathoms long and 5 spans wide, purchased for 16-18 Rials per corge and sold 3-8 pieces for 1 *baar* nutmegs. (30) ‘Cassa bassar’ (*Khasa Bazar*) red striped cloth, 8 fathoms long and 5 spans wide; 1 piece could fetch 30-40 ‘cattis’ cloves in Moluccas. (31) ‘Gassa Kytgii’ (*Khasa Kitgil*), 5 fathom long and 3 spans wide, purchased for 25-30 Rials per corge; in Banda it procured 20-40 ‘catti’ nutmegs for 1 piece of cloth. (32) ‘Rambouty’ (*Rambuti*), white cotton cloth, 8 fathoms long, sold in Makassar for 90-100 Mass = 1 Rials) by the Portuguese to the Malays and Javanese. (33) ‘Beiraram’ (*bhairon*) white cotton cloth, which cost 160-180 Rials per corge at Malacca or Makassar.

This list is abstracted from the document with the modest aim of contributing to the elucidation of Mughal period textile terms, towards which only tentative attempts have so far been made.5

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Plate II: Cotton-ginning: the roller-and-board: Mahmūd Shāhībādī, Miftāhu‘l Fuzalā, British Library MS Or. 3299, f. 100a, 1468-69 A.D.
Plate IV: Cotton-carding: the bow-string device and the mallet: Mahmūd Shādībādī, Miftāhu’l Fuzalā, British Library MS Or. 3299, f.126b, 1468-69 A.D.
Plate V: Cotton-carding: the bow-string device and the mallet: Mahmūd Shādiābādī, Miftāhu‘l Fuzalā, British Library MS Or. 3299, f.259a, 1468-69 A.D.
Plate VI: Spinning-wheel, Mahmūd Shādfābādī, Miftāhu’l Fuzalā, British Library MS Or. 3299, f.151a, 1468-69 A.D.
Plate X: Cage-spool: Mahmūd Shāftimeštādi, Miftāh fuzalā, British Library MS Or. 3299, f.240a, 1468-69 A.D.
Plate XI: "Idris giving instruction to Mankind in the Art of Weaving, 1590-1600". Note especially the beating of cotton with stick at the left corner (below), and the two cage spools, the preparation of yarn for dyeing, the sizing of the warp and treadles. Reproduction in colour, T. Falk and M. Archer, *Indian Miniatures in the India Office Library*, London, 1981, p.47, cat. 4, Pl.3.
Plate XIII: Pit loom with warp winder at work, from Tutinama, 1580-85 A.D. The Chester Beatty Library MS 21, f.79r, reproduction in The Indian Heritage, Court Life and Arts under Mughal Rule, Balding/Mansell, 1982, p.32, Pl.23, "Zarir the weaver of silk garments at his loom in Nishapur, 1580-85 A.D."
Plate XIV: Artisan sizing the warp: Mahmūd Shādībādī, Miftāhu’l Fuzalā, British Library MS Or. 3299, f.271b – 272a, 1468-69 A.D.
Plate XVI: Dyer (rangrez) at work, Mahmūd Shādfābādī, Miftāhu’l Fuzalā, British Library MS Or. 3299, f.133b, 1468-69 A.D.