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Brenda M. King

Orchard House, brendaking@handbag.com

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The Transformation of Tusser Silk

Brenda M. King
Orchard House, Bollington Cross
Macclesfield, Cheshire, SK10 5EG, UK
Tel: ++ (0)1625 573928
brendaking@handbag.com

At the Paris Exposition of 1878 there was a display of printed and dyed Indian tusser silk. This was a striking and important display in a prestigious section of this major international exhibition.

The Prince of Wales had successfully appealed to the French organisers of the Exposition, for a prominent position for the India Court. He was granted the western half of the grand transept; the position of honour among the foreign departments. The Indian Court was a series of elaborate pavilions designed by architect Casper Purdon Clark. The displays of India's goods in the court, were thought to be far superior to those of the Great Exhibition of 1851, and were awarded many honours. The English silk dyer and printer Thomas Wardle produced the Indian tusser silk display in the British India Section of the India Court. It was tusser transformed.

In this paper I will discuss why that display of wild silk was significant then and what significance the transformation of tusser holds today.

Thomas Wardle is generally known as the man who taught William Morris to dye and print cloth. Although that was an important aspect of his career, there is much more to Wardle. He spent many years of his long life trying to overcome many of the problems that beleaguered India's silk production. In particular he experimented tirelessly with India's tusser silk, a wild silk abundant throughout the sub-continent. Why was he so obsessed with this? There were a number of reasons.

Like many Victorian textile manufacturers Wardle thought globally. He was aware that the European silk industry was under threat from increasing exports of silk from China and Japan. Indian silk manufacturers were also importing raw silk from China and Bokhara as their indigenous silks were causing them great problems.

Furthermore, although India had the widest range of wild silks, as well as cultivated silk, they were under-utilised for a number of reasons. Traditional methods of reeling silk in India produced yarn of an uneven thickness, making it difficult to weave. Moreover, although Indian dyers had perfected their techniques over centuries, and were widely acknowledged as second to none, they had never succeeded in dyeing tusser silk. This limited its use even though it was in plentiful supply. Tusser silk was used in its natural golden state in India and was valued as such, there was, however, no export market for it. The natural tones, from pale gold to brown, were not fashionable in Europe; furthermore it was slubbed. Wardle felt that if he could only dye tusser yarn he could open up an export market with huge potential for India's raw silk producers.

Acting on advice from Wardle and using the latest technology from Europe, which he recommended, some of the silk reeling problems were solved by India's producers. Wardle and other English manufacturers in Macclesfield, Cheshire, then experimented

with weaving the improved yarn in its undyed state. Eventually satisfied they succeeded in producing fine, self-coloured patterns.¹

After using microscopic investigation over many years, Wardle eventually understood why tusser yarn was so resistant to dyes and he started to overcome the problems. He established that raw tusser yarn was coated in a protective gum, different to other silk gums, and which prevented dyes from permeating the yarn. After years of experimenting in England, using natural dyes sent to him from India for the purpose, Wardle learnt to remove the gum and dye the yarn in delicate tones, his persistence had paid off. By the time of the Paris international exhibition of 1878 he could produce yarns in almost any shade required.

Wardle dyed tusser silk yarn using both Indian dyestuffs and aniline dyes to maximise its potential at Paris. The fourteen rich 'jewel colours' were exhibited in a small display case, which I subsequently 'discovered' in the Department of Economic Botany, the Royal Botanical Gardens in Kew, London. It had lain there since 1881, undiscovered and unrecognised until a few years ago. It has Wardle's name and the date 1881 on the underside. The colours are still rich and glowing, with no evidence of fading at all.

Paris was well chosen for the launch of transformed tusser, the dyed yarns were immediately introduced to the large and prestigious French silk industry on its home ground and French manufacturers swiftly became aware of its new potential. Throughout the period of the Exposition, Thomas Wardle actively marketed the yarn to the French. He had a number of French business contacts, which he used to great effect. This was done despite the fact that imported French silks were the cause of great concern to English silk manufacturers. They experienced great difficulty in competing with French goods as English consumers favoured French designs over British ones.

Wardle's 38-page article, in French, for the official exhibition catalogue described the yarn and Indian dyestuffs in scientific detail for the first time. It became an influential work of reference for the global silk industry and earned the respect of French silk manufacturers.

The display in Paris also included moths, cocoons, and hand-block printed tusser silk. The tusser cloth was hand-woven in India, but block-printed with fast dyes at Wardle's dye works in Staffordshire, England; it represented another transformation. This was the first time that anyone had succeeded in printing onto wild silk cloth of any kind, either in the East or Europe. It was a major breakthrough. The use of printed indigo, was a particular triumph. Indigo dyeing is a notoriously difficult procedure and it was usually applied as a 'pencil' blue.

A number of the block printed designs were by William Morris, already known as the leading British textile designer. This was the period when Wardle and Morris were experimenting with natural dyestuffs at Wardle's dye works². Thinking that Indian designs were the most appropriate Wardle used Indian wood blocks to print the other samples.

A further display of Indian tusser silks, dyed and printed in the new 'Art' colours by Wardle, for Liberty & Co., was also shown at the Exposition, many of which were also inspired by Indian designs. The response in Paris was overwhelmingly enthusiastic.

After the exhibition the silk samples went to South Kensington Museum [now the Victoria & Albert Museum] where they were used to promote trade with India. Wardle produced a *Handbook of the Collection Illustrative of the Wild Silks of India in the Indian section of the South Kensington Museum, with a Catalogue of the Collection and Numerous Illustrations*.³ The learned publication was aimed at silk manufacturers in Europe in the hope that they would be better informed and overcome their resistance to India's wild silks.

As if that wasn't enough Wardle & Co also displayed his new product 'Sealcloth.' It was produced from waste tusser yarn, which was previously discarded. Tusser silk is particularly strong [3 times the strength cultivated silk] and the durable yarn had a lustrous finish. Wardle experimented with waste tusser in Germany and developed a new technique, which wove the waste yarn on to a cotton backing. The result was a washable, breathable, waterproof fabric with a short glossy pile that resembled sealskin. Sealcloth. It proved highly suitable for women's capes, rugs and other out door clothing. Although Wardle didn't manufacture the new product himself, woollen manufacturers in Yorkshire took up the production of Sealcloth.

The Paris displays visibly demonstrated to a huge international audience the vastly increased potential of Indian tusser. The transformation of tusser silk meant it could now be dyed and printed, spun and used for clothing, upholstery, passementerie, sewing and embroidery thread.

The display earned Wardle & Co a gold medal, the highest accolade from the French. He passed this to the Indian government, as he felt it was rightly theirs as the raw materials were from India.

Wardle was proactive and determined in his promotion of silk to the French, as he knew their raw silk consumption could be huge. French manufacturers responded positively and requested their own study collection of India's silks. Wardle formed a collection at his own expense, including all his detailed technical data, for the Chamber of Commerce in Lyon, the heart of French silk production. It was displayed there for many years.

In the event French manufacturers began trading with Indian suppliers directly and the demand for tusser grew so large that demand outstripped supply. This gave greater security for Indian producers. India had a long-standing history of exporting textiles and raw materials and this was encouraged to continue.

Encouraged by his successes Thomas Wardle worked with his wife Elizabeth to extend the use of tusser yarn in Europe even further. Mrs Wardle was founder and Director of the Leek Embroidery School in Staffordshire (1879).

Elizabeth Wardle perfected a method of stitching which exploited the qualities of tusser floss yarn to great effect. The long lustrous fibres meant it was particularly suitable for needlework.

A distinctive Leek style developed which used simple, but densely packed stitches to develop rich tones and shading. The main appeal lay in its beautiful colouring. Using vegetable dyes Thomas dyed the yarn in rich subtle colours, this was emphasised by

couched gold thread in some designs, used to outline motifs, emphasising the opulent treatment.

Generally, there were two distinct types of Leek embroidery. Designs for ecclesiastical use, many by leading Arts and Crafts architects, were usually worked on a brocaded silk ground. More domestic items were hand- block printed by Wardle & Co on to tusser cloth woven in India. Morris other leading designers provided designs for the Leek school, while Indian textiles inspired many other designs. The two dimensional and scrolling nature of Indian designs were eminently suitable for embroidery and utilised well the rich tones of the vegetable dyes. The Leek Embroidery Society became a notable one; at one stage embroidery kits were produced to be worked at home.

Throughout this period, and fostered by the Arts and Crafts movement, there was a growing demand for embroidery thread in subtle colours, a reaction against increasing use of garish synthetic dyes. Tusser yarns dyed by Wardle with vegetable dyes filled a large gap in the market. This new use of tusser silk was to have a major impact on its demand and significantly increased exports from India

Conclusion

Thomas Wardle was an ethical and socially responsible manufacturer who upheld many Arts and Crafts principles. He believed in the power of beauty to enrich everyday life. His intention was always to produce goods of the highest standard using craft skills were possible. He was also deeply concerned to protect the skilled workforce in Britain and India.

His concern for well made and designed goods was rooted in his anxiety over an unstable global silk industry and the elimination of poverty that was so often a feature of it. He was only too aware that if the Indian and English silk industries declined further then many thousands of families would suffer. As a citizen of the Empire he used his skills to support its fellow members. He also wanted people to use what natural products lay in front of them, for the good of the whole. Through his concerted efforts the improved raw silk that was so abundant in India found new markets in India and Europe. England secured a supply of improved yarn from within the empire, India's silk producers greatly extended their domestic and export markets.

At that time the European silk trade was characterised by small firms and the sharing of expertise. By banding together Thomas Wardle knew that European silk manufacturers would be better able to protect themselves from the increasing threats, caused by the massive increase in silk production in the Far East. He studied the latest reeling technology in Italy, sericulture in France, cloth development in Germany, adding his knowledge of dye chemistry to this pool of expertise. He took these advances to India where the declining silk industry benefited from the spread of ideas. In turn he promoted improved Indian silk to his rivals, as the French market was important to India even though a rival for English manufacturers.

Employment for thousands was more important than one company's profit. In 1897 Thomas Wardle received a knighthood for his work for the British silk industry, France's highest honour the Legion d'Honneur, for his work for the international silk trade, and many accolades from India. The results of his efforts lasted until the 1930s when silk

went into decline globally in the face of competition from synthetic yarn production and the massive influx of silk from Japan.

Researching the Anglo/Indian silk trade transformed many of my ideas about the history of empire. One purpose of this paper is to indicate that it is made up of many histories; many of which are the histories of individuals. Trade was the realm for a rich, two-way cultural exchange and spread of ideas. Creativity, innovation and entrepreneurship were nurtured through mutually beneficial collaboration

Through this short history of tusser silk we can demonstrate how the Anglo/Indian silk trade was symbiotic, mutually supportive and beneficial. The relationship here was one between equals addressing aesthetic and technical problems against a background of shared values and mutual respect. Furthermore, throughout his long working life Wardle, along with many other leading theorists, upheld Indian designs as exemplary in every respect. He often stated that British designers had much to learn from them concerning the use of colour, dye technology and deep understanding of design principles.

Wardle's actions exemplify the healthy relationship between two cultures: East and West, Art and science. Indian textiles were clearly more the subjects of admiration than appropriation.

Note: Taken from a larger body of research, this paper is one of several case studies.

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¹ There are a number of manufacturers pattern books, which contain examples of the woven tusser silk, in Macclesfield Museums Trust, Macclesfield, Cheshire, UK.

² The Whitworth Art Gallery, Manchester, England, has a number of Wardle pattern books containing colour trials from this period. The books contain samples of William Morris designs printed by Wardle on to tusser cloth. We can see from these samples the painstaking efforts that both men went to get the exact shades required.

³ Published by Eyre and Spottiswood, for HMSO, London 1881.