

# The Establishment of the Modern Cotton Textile Industry in late Nineteenth Century China A Comparison with Japan\*

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The cotton textile industry was the world's first mechanized industry. It once played a leading role in the history of the industrial revolution. When the industrial revolution spread across the world, the cotton industry was given top development priority. From the nineteenth century onwards the modern cotton industry in non-Western countries was established by introducing technology from the West. In Asia, from the mid-nineteenth century, India, Japan and China successively set up their cotton mills. Due to the different conditions and prevailing international settings in these three countries, the development of their respective cotton industries differed somewhat. The modern cotton industry in India began in 1854, and in 1876 it already had one million spindles and 9,000 looms. By the end of the nineteenth century, India processed 193 cotton mills with 40,000 looms and five million spindles.<sup>1</sup> In 1867, Japan introduced cotton technology from Great Britain and set up a small spinning mill. The modern cotton industry in Japan, however, did not develop at a rapid rate until 1883 when the Osaka Spinning Mill commenced production. In 1900, there were 65 cotton mills in Japan and over one million spindles.<sup>2</sup> The Chinese cotton manufacturing industry got off to a relatively late start. Its first cotton mill did not go into production until the end of 1889. As a result, for quite a long time, China became a market for India and Japan to dump their cotton yarn and cloth.<sup>3</sup> Moreover, in

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\* I am indebted to Dr. Leonard Blussé of Leiden University and Professor Luo Rongqu of Beijing University for their helpful comments and practical improvement of my English.

1 S. D. Mehta *The India Cotton Industry: An Economic Analysis* (Bombay 1953).

2 Takako Sanpei *Nippon Mengyo Hattatsu Shi* [The development of the cotton industry in Japan] (Tokyo 1941) 66.

3 From 1874 to 1912, the export yarn from India into China made up 83.3 to 94.6% of the total export of yarn from India; in Japan, its export yarn into China amounted to 84.3 to 91.2% of total export from 1902 to 1909. See Yan Zhongping *Zhongguo Mianfangzhi Shi Gao* [Draft history of the cotton industry in China] (Beijing 1955) 84, 146.

the early twentieth century, taking advantage of certain privileges stipulated in some pacts, Japan built a number of cotton mills in China.<sup>4</sup>

The similarities and differences, as well as the interrelations among cotton textile industries in India, Japan and China attracted the attention of economists and historians.<sup>5</sup> We, as Chinese, are of course more concerned with the development of the modern cotton industry in China. Many scholars claim that textile handicrafts were responsible for the late development of the Chinese cotton industry.<sup>6</sup> Some scholars even maintain that traditional hand-spinning caused the late development of China's modern cotton industry.<sup>7</sup> There is some sense to these viewpoints, but they reflect only one aspect of the question. They fail to pay enough attention to the process of the establishment of China's modern cotton textile industry and are inclined to come to a simple conclusion on a complicated question. This paper will focus on this process so as to discuss the reason why China fell behind in introducing modern cotton textile technology. It will also consider the social factors which affected China's import of modern cotton technology from the West. These questions will be studied by comparing the development of the modern cotton textile industry in China with that in Japan.

## 1. Cotton-related Imports and Foreign Attempts to Launch Cotton Mills in China

Ancient China had highly developed textile technology. Prior to the Opium War (1840), China had the largest hand-spinning textile industry in the world and it was also one of the major textile exporters. China native cloth, especially nankeen, was once very popular in Europe and the United States for its durability. However, the traditional Chinese cotton textile industry remained, for a long time,

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<sup>4</sup> The Japanese-owned spinning mills in China had 111,936 spindles in 1913 and 2,485,352 in 1936; in the same period the number of spindles in Chinese-owned mills increased from 484,192 to 2,919,708. See Yan, *Op. cit.*, 354-55. For the development of Japanese-owned mills in China, see Takafusa Nakamura *Kindai Nihon Mengyo to Chugoku* [Modern Japan's cotton industry and China] (Tokyo 1982).

<sup>5</sup> See for example: Keijiro Otsuka, Gustav Ranis & Gary Saxonhouse *Technology Choice in Development: The India and Japan Cotton Industries* (Hong Kong 1988); T. Nakamura *Op. cit.*

<sup>6</sup> See Roman H. Myers 'Cotton Textile Handicraft and the Development of the Cotton Industry in Modern China', *Economic History Review* 18:3 (December 1965) 614-32; Albert Feuerwerker 'Handicraft and Manufactured Cotton Textiles in China, 1870-1910', *Journal of Economic History* 30:2 (June 1970) 338-78; Mark Elvin 'High Level Equilibrium Trap: The Course of the Decline of Invention in Traditional Chinese Textile Industry', in W. E. Willmott, ed. *Economic Organization in Chinese History* (Stanford 1972) 137-72; Kang Chao 'The Growth of a Modern Cotton Textile Industry and the Competition with Handicraft', in Dwight H. Perkins, ed. *China's Economy in Historical Perspective* (Stanford 1975) 167-201.

<sup>7</sup> Xu Xingwu 'Zhongguo he Riben Mianfangzhiye Zibenzhuji Mengya de Bijiao Yanjiu' [The seeds of capitalism in traditional cotton industry in China and Japan: a comparative study], *Lishi Yanjiu* 6 (November 1981) 69-80.

at the level of household hand-spinning and its techniques were backward. A hand spinning wheel with one spindle was the predominant piece of equipment throughout China. While one bolt of cloth could be woven in one workday (10 or 12 hours), an average of only 250 grams of yarn could be spun in the same amount of time. Therefore, a bolt of cloth was supplied by yarn spun in 3.5 workdays.<sup>8</sup>

In the first half of the nineteenth century, the small-scale peasant economy in China was challenged by the civilization of Western modern industry. After 1830, the export volume of Chinese native cloth decreased drastically and, after the Opium War, cloth and yarn imports from Britain and the United States suddenly increased. During the period of 1850 to 1853, China became one of the most important overseas markets for cloth produced in the United States. Cloth exported to China accounted for 32 to 40% of the total cotton fabric exports in the United States.<sup>9</sup> From 1843 to 1867, the value of China's cotton-related imports increased from 2.6 million to 13 million taels of silver. During the period from 1867 to 1894, China's cloth imports increased in value from 12 to 31 million taels, while the import of yarn sharply rose to 21.4 million taels from 1.46 million taels. Originally, yarn was mainly imported from Britain, but from 1870 onwards, Indian coarse yarn overtook China's market due to its low price and suitability for hand weaving.<sup>10</sup>

Certain features stand out regarding imports of cotton goods to China from 1860 to 1890: first of all, the growth rate of yarn imports was much higher than that of cloth imports; secondly, the value of yarn imports was much smaller than that of cloth imports. For instance, between 1871 to 1873, the import value of cloth accounted for 30.2% of China's total imports, whereas the value of yarn accounted for a mere 2.8%. From 1881 to 1883, the import value of cloth was 22.8% of China's total import value, but that of yarn accounted for 5.8%.

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<sup>8</sup> See Wu Chengming 'Wuoguo Shougong Mianfangzhiye Weishenmo Changqi Tingliu zhai Jiating Shougongye Jieduan' [Why did the Chinese handicraft cotton industry stand in the state of cottage industry from ancient to modern time?], *Wen Shi Zhe* 1 (January 1983) 26-33; Dieter Kuhn 'Textile technology: spinning and reeling', in Joseph Needham, ed. *Science and Civilization in China* 5. 9 (Cambridge 1986) 220-35.

<sup>9</sup> Shü-lun Pan *The Trade of the United States with China* (New York 1927) 206.

<sup>10</sup> See Yang Duanliu and Hou Houpei *Liushiwu Nian lai Zhongguo Guoji Maoyi Tongji* [Statistics of China's foreign trade during the last sixty-five years] (Nanking 1931) 20. See also Wang Jingyu 'Chong Mianfangzhiping de Maoyi Kan Zhongguo Zibenzhuyi de Chansheng' [On the origin of capitalism in China as viewed from the cotton textile trade], *Zhongguo Shehui Jingji Shi Yanjiu* 1 (1986) 1-18. Masaki Koyama, in his 'Shinmatsu Chūgoku ni okeru Gaikoku no Ryūnyū' [The inflow of foreign cotton goods in the late Qing], in *Kindai Chūgoku Kenkyū* 4 (1960) 1-108, gives a detailed account of the market for imported cloth and yarn.

**Table 1.**  
**Quantity & Value of Cotton Yarn & Cloth Imports, 1871-1903<sup>11</sup>**

Year	Yarn			Cloth		
	1,000 piculs	1,000 Haiguan taels	% of the total import value	1,000pieces	1000 Haiguan taels	% of the total import value
1871-1873	188	5,796	2.8	25,669	62,514	30.2
1881-1883	585	13,975	5.8	38,582	56,824	22.8
1891-1893	3,497	61,000	14.6	46,458	90,137	20.5
1901-1903	7,459	171,542	18.6	58,918	184,276	19.7

While exporting their cloth and yarn to China, British and American businessmen began to set up cotton mills in China in pursuit of even greater profits.<sup>12</sup> In 1868, Britain's Glover and Company organized a steam cotton mill company in Shanghai and attempted to collect shares amounting to 75,000 taels to set up a weaving factory. It should be noted that the factory was expected to produce machine woven Chinese native cloth in line with Chinese tastes, instead of weaving foreign-type cloth. However, this plan fell through due to firm resistance from textile handicraft businesses in Shanghai. In 1877, C. T. Skeggs from Britain established the Shanghai Steam Cotton Mill Company in Shanghai and he prepared to purchase shares totalling 200,000 taels to set up a cloth weaving factory with an annual capacity of 600,000 bolts. His plan was also opposed by textile handicraft businesses in the city. Some foreign businesses, though, were successful in their attempts to launch cotton mills. In 1871, an American businessman, Vrooman, and a few Chinese businessmen jointly started a small-sized spinning mill in Guangzhou. The mill had 1,280 spindles and employed steam-driven machines. As the first modern cotton mill in China, it could spin fifteen counts of rove. It was closed down, though, after half a year of production due to its small size and low operation efficiency.<sup>13</sup>

Imports of foreign yarn and cloth resulted in great changes in China's traditional textile handicraft industry. Those at the treaty ports were first to suffer, with hand spinning in other areas being affected next. Prior to 1985, though, the foundation of the traditional cotton industry remained stable. Meanwhile, imports

<sup>11</sup> Yang Duanliu & Hou Houpei *Liushiwu Nian lai Zhongguo Guoji Maoyi Tongji* [Statistics of China's foreign trade during the last sixty-five years] (Nanking 1931) 20, 46. Yan Zhongping, et. al., eds. *Zhongguo Jindai Jingjishi Tongji Zhiliao Xuanji* [Selected statistical materials of modern Chinese economic history] (Beijing 1955) 76.

<sup>12</sup> Wang Jingyu *Shijiu Shiji Waiguo Zibenzhuayi dui Zhongguo de Jingji Qinlue* [Foreign capitalism's economic invasion of China in the nineteenth century] (Beijing 1983) 390-410.

<sup>13</sup> *Jiaohui Xingbao* [Mission news] 4.159 (October 28, 1871) 44-45, and 6.251 (September 6, 1873) 6.



of foreign yarn in great amounts stimulated the development of hand-weaving and hand-weaving workshops emerged in some areas.<sup>14</sup> On the other hand, the import of foreign cotton goods and foreign attempts to set up mills also promoted the establishment of the modern machine cotton textile industry in China.

## 2. The Establishment of the Shanghai Cotton Cloth Mill

Imports of foreign cotton textiles to China helped the Chinese people realize the importance of developing their own cotton industry. A scholar, Feng Guifen, stipulated this in as early as 1861.<sup>15</sup> Nevertheless, the government of the Qing Dynasty was concentrating on the development of the military industry, and thus, the civil industry was not put on the agenda until the 1870's.<sup>16</sup>

In 1874, some senior officials of the Qing Government held a meeting to discuss the question of coastal defense. During the discussion, the question of the textile industry aroused their interest. Li Hongzhang, a member of the Self-strengthening Movement, pointed out that, "Woolen goods and cloth imported from Britain cost about 30 million taels each year, and these imports encroach on the interests of China's textile industry. Why don't we purchase machines to produce the cloth ourselves?"<sup>17</sup> In the early part of 1876, Li sent one of his assistants, Wei Lunxian, to Shanghai to collect shares and make preparations for setting up a weaving factory. However, Wei failed to win support from businessmen in Shanghai and this plan to set up a weaving factory was unsuccessful as they failed to collect enough shares.<sup>18</sup>

Wei's failure did not mean that Chinese businessmen were reluctant to invest in the cotton industry. In fact, they were already active in the operation of foreign businessmen's mills in China.<sup>19</sup> In the companies of Skeggs and Vrooman, there were some Chinese businessmen who actively took part in management and who also held shares. In 1877, in response to a suggestion of Britain's Jardine, Matheson and Company, some compradore businessmen established the Anglo-

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<sup>14</sup> Chen Shiqi 'Jiawuzhanzheng qian Zhongguo Nongchun Shougong Mianfangzhiye de Bianhua he Zibenzhuayi Shengchan de Chenzhang' [The change and the development of capitalistic productions in Chinese rural handicraft cotton textile industry], in Institute of History, Amoy University, ed. *Zhongguo Jingji Shi Lunwen Ji* [Papers on Chinese Economic History] (Fuzhou 1981) 343-349.

<sup>15</sup> Feng Guifen 'Chai Xixue Yi' [On the adoption of Western learning], in his *Jiaobinglu Kangyi* [Straightforward Words from the Lodge of Early Zhou Studies] 2 (Taipei 1967).

<sup>16</sup> See Zhang Guohui *Yangwu Yundong yu Zhongguo Jindai Qiye* [The Self-strengthening Movement and modern enterprises in China] (Beijing 1979).

<sup>17</sup> Li Hongzhang 'Pengliao Hangao' [Letters], in *Li Wenzhonggong Quanji* [Complete papers of Li] 16 (Nanking 1905) 3.

<sup>18</sup> Zhang Guohui *Op. cit.*, 117-24.

<sup>19</sup> Wang Jingyu *Jingji Qinlue* 393-410.

Chinese Shanghai Cotton Cloth Mill Company.<sup>20</sup> They planned to collect 350,000 taels to purchase 800 looms. The mill was to be managed by Jardine, Matheson and Company. However, the plan encountered resistance from the Chinese authorities as the Qing Government had aspirations of controlling this industry themselves. Obviously, any industrial plan which failed to obtain the support of the Chinese authorities at that time would be unlikely to succeed. However, the Qing Government was short of funds and without investment from businessmen, it could not set up its own cotton mills.

Just as Jardine, Matheson and Company's plan was rejected, Peng Rucong, an official who was removed from office, raised a proposal to establish a cotton mill to Li Hongzhang, Governor-General of Zhili at Tientsin, and Shen Baozhen, Governor-General of Liangjing at Nanking. Peng intended to follow the example of the China Merchants' Steam Navigation Company, set up in the form of a joint stock company, when establishing a cotton mill. He planned to collect 500,000 taels to purchase 800 looms and to hire technicians from abroad. He estimated that when the mill went into normal operation, annual profits would be 150,000 taels. Peng asked Li and Shen to support his mill and to assign officials to manage the mill with him.<sup>21</sup> On Peng's behalf, the plan could be used, in the name of the government, to suppress opposition from the handicraft industry; and for Li, this new industry would be put under his control. Thus, the plan agreed with the interests of both sides. In October 1878, Li Hongzhang approved the plan and appointed Peng as general director and Zheng Guanying and others as managers.<sup>22</sup> The mill was to be named the Shanghai Cotton Cloth Mill. It should be noted that in Chinese, the name of the mill was "Shanghai Jiqi Zhibu Ju". The Chinese word "Ju" means bureau or administration. Thus, the utilization of "Ju" in the naming instead of "mill" or "company" suggested that it was a new agency under the supervision of the Qing Government instead of an ordinary enterprise.

However, Peng did not want the government meddling in the mill's management. He merely wanted them to protect his enterprise and have the merchants manage the mill independently. This was against the intentions of Li Hongzhang and other officials who wanted to control the mill. Thus, Sheng Xuanhuai, one of Li's trusted followers, deliberately made it difficult for Peng to

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<sup>20</sup> Edward LeFevour *Western Enterprise in Late Ch'ing China: A Selective Survey of Jardine, Matheson and Company's Operation, 1842-1895* (Cambridge, Mass. 1970) 36-37.

<sup>21</sup> Translations of Peng's petition and of the regulations which he enclosed, are printed in the *North-China Herald* (Feb. 21, 1879) 168-171. See Sun Yutang *Zhongguo Jindai Gongye Shiliao, 1840-1895* [Sources materials of the history of modern industry in China, 1840-1895] (Beijing 1957) 1037-39.

<sup>22</sup> *North-China Herald* (Feb. 21, 1879) 170-71.

collect funds and purchase a site for the mill. In the end, Peng was forced to resign from his post in the autumn of 1879.<sup>23</sup>

After Peng's resignation, Li Hongzhang reorganized personnel. In 1880, an official, Gong Shoutu, was appointed general manager in charge of all official matters (*guan-wu*); Zheng Guanying was in charge of all business matters (*shang-wu*) and also a general manager. Zheng Guanying and Jing Yuanshan, who both represented merchants, were also trusted followers of Li Hongzhang. Via this reorganization, the Shanghai Cotton Cloth Mill became a real "guandu shangban" enterprise.<sup>24</sup> In April 1882, based on a petition presented by Li, the Qing court gave special approval to the mill enabling it to enjoy a monopoly of power for a decade. Within that decade, other Chinese and foreign businessmen would not be allowed to launch new textile mills in China. Chinese could, though, invest in the Shanghai Cotton Cloth Mill. Meanwhile, the mill was also deemed the privilege of being tax exempt.<sup>25</sup>

Zheng Guanying and his colleagues revised plans for setting up the mill. They planned to equip the mill with 400 looms and some gins and spindles at first, adding equipment as time went on according to business growth. In October 1880, the mill published "Regulations on Collecting Shares". It planned to collect 4,000 shares (each share was worth 100 taels).<sup>26</sup> Chinese merchants competed with one another to buy shares and within one month, the mill collected 300,000 taels. In the beginning of 1881, the collection of shares was completed with total shares amounting to 500,000 taels, 100,000 taels more than the original plan.<sup>27</sup>

In August 1881, A. W. Danforth, an American engineer, was invited to Shanghai and appointed chief engineer of the preparatory technical work for the mill.<sup>28</sup> Results of his investigations led him to feel that since the fiber of Chinese raw cotton was shorter, it would be necessary to reset weaving and spinning machines made in Europe and the United States, so as to produce cloth of the same quality as Western cloth. In the autumn of 1881, Danforth took Chinese new cotton with him to the United States and Britain and conducted experiments on this so as to order appropriate equipment. After about one year he returned to

<sup>23</sup> See Chen Meilong 'Lun Wan-Qing Shanghai Jiqi Zhibuju de Xingzhi' [On the characteristics of the Shanghai Cotton Cloth Mill in the late Qing], *Jindaishi Yanjiu* 3 (1986) 77; Sun *Op. cit.*, 1039-41.

<sup>24</sup> For the "guandu shangban" policy, see Albert Feuerwerker *China's Early Industrialization: Sheng Hsuan-huai and Mandarin Enterprise* (Cambridge, Mass. 1958) Ch. 1.

<sup>25</sup> Li Hongzhang *Quanji*, *Zhougao* [Memorials] 43, 43-44.

<sup>26</sup> The regulations are printed in *Sen Bao* (October 13, 1880). See Sun *Op. cit.*, 1041-48.

<sup>27</sup> Sun *Op. cit.*, 1048-50.

<sup>28</sup> Institute of Modern History, Chinese Academy of Sciences, et al., eds., *Yangwu Yundong* [The Self-strengthening Movement] 7, 489; see also Xia Dongyuan, ed., *Zheng Guanying Ji* [Collected works of Zheng Guanying] 1 (Shanghai 1983) 715-18.

Shanghai in the autumn of 1882. Between summer and autumn in 1883, the equipment, including 53,000 spindles and 500 looms, was shipped to Shanghai in three batches. The gins and looms were made in Britain, and the spinning frames and steam engines were made in the United States. The spinning machines were advanced newly-made ring spinning frames.<sup>29</sup>

While preparations were being carried out, Shanghai experienced a serious financial crisis.<sup>30</sup> The Shanghai Cotton Cloth Mill was also short of funds. It turned out Zheng Guanying had lent the money collected in shares to private banks (*qianzhuang*, old style Chinese banks) to earn interest while at the same time placing mortgage loans on the rubber shares of the mill. During the period of the financial crisis, at the end of 1883, the mill could neither withdraw its money nor repay its loans. It suffered severe losses. This resulted in the construction of the mill being suspended. In February 1884, Zheng Guanying was transferred to Guangzhou. Before Zheng left Shanghai, Gong had already left and his brother Gong Yitu had succeeded him in his previous position. Zheng's position was taken over by Jing Yuanshan. Internal investigations conducted by Jing found that Gong Shoutu had misappropriated 8,000 taels. He reported the matter to Li Hongzhang, demanding that Gong return the money. However, the Gong brothers disclosed the inside story of the mill and, shirking all responsibilities, and blamed all on Zheng Guanying.<sup>31</sup> In order to resume the setting up of the mill, Jing Yuanshan proposed a new plan to enhance the power of the merchants and to resell shares. He also insisted on appointing talented people to take charge of the management of the mill.<sup>32</sup> His intention was to remove the Gong brothers who had long been at odds with the merchant shareholders. Nevertheless, Li Hongzhang did not approve of this plan. Before long, Jing resigned from his post and the construction of the Shanghai Cloth Mill was suspended for four years.

In 1887, under the direction of Li Hongzhang, construction of the mill resumed. Gong Yitu and Gong Shoutu were appointed general managers and Yang Zonglian was named assistant manager. The mill reissued stocks and the old shares depreciated in value by 30%. Due to the efforts of Gong and Yang, the mill was able to collect sufficient funds. In April 1888, the construction of

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<sup>29</sup> See Sun *Op. cit.*, 1059-65. A. W. Danforth himself changed the number of pieces of ordered equipment and he purchased more than planned. See Zheng Guanying to Sheng Xuanhuai, (March 2, 1884) in Sheng Xuanhuai Papers, Shanghai Library; see also Xia Dongyuan, *Zheng Guanying Zhuan* [A biography of Zheng Guanying] rev. ed. (Shanghai 1985) 48.

<sup>30</sup> See Du Xuncheng *Mingzu Ziben-zhuyi yu Jiu Zhongguo Zhengfu* [National capitalism and the former Chinese governments] (Shanghai 1990) 19-28.

<sup>31</sup> Zheng Guanying to Sheng Xuanhuai (Feb. 15, 1884) in Sheng Xuanhuai Papers, Shanghai Library. See Wang Xi 'Lun Zheng Guanying' [On Zheng Guanying], *Lishi Yanjiu* 1 (January 1982) 34; Xia Dongyuan *Zheng Guanying Zhuan* rev. ed. (Shanghai 1985) 65-67.

<sup>32</sup> Jing Yuanshan *Juyi Chuji* [Collected works] 2, 34-36; see also Chen Meilong *Op. cit.*, 85-86.

workshops resumed. A. W. Danforth was still the chief engineer.<sup>33</sup> The construction of workshops was completed in April 1889 and by December, installation of equipment was also completed. On December 28, 1889, the mill commenced operations.<sup>34</sup> A total of eleven years had been spent on the construction of the Shanghai Cotton Cloth Mill.

Production at the mill yielded considerable profits. In 1893, the bonus rate per share reached 25%.<sup>35</sup> In particular, yarn spinning was profitable. Li Hongzhang then decided to implement spinning equipment on a large scale and to construct a new spinning mill within the Shanghai Cotton Cloth Mill. However, before the construction of the new mill was completed, a fire broke out in the scratching room of the mill in October 1893, destroying all the workshops.<sup>36</sup> Considering the high profit potential of the mill, Li Hongzhang immediately assigned Sheng Xuanhuai to plan for a new mill. Sheng collected one million taels, mostly from government enterprises, and reconstruction of the mill progressed smoothly. In September of 1894, production resumed. The reconstruction enlarged the scale of the mill which now had 64,566 spindles and 750 looms. The name of the mill was changed to Huasheng Spinning and Weaving Mill.<sup>37</sup>

### 3. Lost Opportunities

A comparison between the modern cotton industry in China and Japan shows that China lost an important opportunity to develop its cotton manufacturing industry in the 1880's. This was to exert adverse effects on the development of the cotton textile industry in China.

The development of the mechanical cotton textile industry in Japan occurred slightly earlier than in China. However, this was not necessarily a smooth development. In as early as the late years of the Shogunate, the Satsuma domain established a textile mill with 100 sets of looms and 2,640 spindles at Kagoshima. From 1870 to 1871, another two spinning mills were respectively built in Sakai and Kashima, but these mills were neither successful technologically nor managerially. After the Meiji Restoration, Japan made efforts to develop the cotton manufacturing industry. At the turn of the 1870's, the Meiji Government

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<sup>33</sup> Sun *Op. cit.*, 1052-55.

<sup>34</sup> *Shen Bao* (December 27, 1889); *Yangwu Yundong* 7, 475-476; Sun, *Op. cit.*, 1055-60.

<sup>35</sup> Imperial China Maritime Customs *Decennial Reports, 1892-1901* 1 (Shanghai 1904-06) 513; Zhang Guohui *Op. cit.*, 279-80.

<sup>36</sup> Sun *Op. cit.*, 1069-72.

<sup>37</sup> Xia Dongyuan *Sheng Xuanhuai Zhuan* [A biography of Sheng Xuanhuai] (Chengdu 1988) 169-170.



invested in model spinning mills, including those in Aichi and Hiroshima. The Government also provided ten-year interest loans to support the setting up of ten spinning mills and to help them import foreign equipment. The size of the mills, however, was small and each mill had only 2,000 spindles. Water was used as the driving power, technology was comparatively backward and there was a shortage of technicians and engineers. Eventually, the mill with 2,000 spindles closed down due to financial difficulties.<sup>38</sup> Meanwhile, imports of yarn continued to increase and from 1868 to 1888, imported yarn increased from 12,000 bales to 158,000 bales, reaching an all time high.<sup>39</sup> It was not until the Osaka Spinning Mill was established and large-scale spinning technology was imported and introduced that Japan's cotton industry headed toward success.<sup>40</sup>

The Osaka Spinning Mill was planned in 1879, almost at the same time that preparation work for the Shanghai Cotton Cloth Mill commenced. Work on the site of the Osaka Spinning Mill and its construction began even later than that of the Shanghai Mill. It is thus clear that, although China's modern cotton industry was born a few years later than Japan's, Japan's modern cotton industry was unsuccessful in its early stage of development. By the end of the 1870's, China and Japan were both ready to import modern cotton textile technology. However, the progress of actual construction of the two mills differed greatly.

Led by Eiichi Shibusawa, the Osaka Mill set up a joint stock company—the Osaka Spinning Company—and collected 250,000 yen. The construction of the mill, directed by Takeo Yamabe, proceeded smoothly. In January 1882, the mill ordered spinning machines from the Platt Company of Britain. Construction commenced in June of the same year, being completed in July 1883. From December 1882 to April 1883, equipment was shipped to Japan. It took over a year to install the machines. In July 1883, a number of the machines went into operation and, in the following April, all of the machines were operating. Driven by steam engines, the fifteen sets of spinning machines were self-acting spinning mules produced by Platt of Britain. Each of them had 700 spindles. The mill had two shifts, operating day and night. It made profits in its very first year of operation and the dividend rate reached 18% in the second year. The success of this mill not only put an end to the slump situation in the spinning mills using 2,000 spindles each, but also immediately promoted the development of the cotton manufacturing industry in Japan. From 1886 to 1891, eleven large-sized spinning

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<sup>38</sup> Nakaoka Tetsuro, et al. *Kindai Nihon no Gijutsu to Gijutsu Seisaku* [Technology and technology policy in modern Japan] (Tokyo 1986) 47-77.

<sup>39</sup> G. C. Allen *A Short Economic History of Modern Japan* 4th ed. (London 1981) 72.

<sup>40</sup> Haruma Kandaichi 'Kindai Bosekigyo no Ishoku to Ringukata Kojo no Seiritsu' [The transplantation of the modern cotton industry and the establishment of ring spinning mills], in Unno Fukuju, ed. *Gijutsu no Shakaishi* [A social history of technology] 3 (Tokyo 1982) 132-166.

mills went into operation in Japan, with a total of 176,153 spindles. Meanwhile, the self-acting spinning mules were gradually eliminated and replaced with imported advanced ring spinning frames. The eleven mills had ring spinning frames with 119,330 spindles, accounting for 67.7% of the total. The Osaka Spinning Company also established a second mill with both self-acting mules (16,800 spindles) and ring spinning frames (4,020 spindles). A third mill with ring spinning frames (30,000 spindles) was set up in 1889.<sup>41</sup> By the end of the 1880's, the mechanical cotton industry was firmly established in Japan.

**Table 2: Chronological Table of the Establishment of the Shanghai Cotton Cloth Mill & the Osaka Spinning Mill, 1878-1889**

Year	Shanghai Cotton Cloth Mill	Osaka Spinning Mill
1878	October: Peng Rucong raises proposal; Li Hongzhang approves plan and appoints Peng as general director.	
1879	Autumn: Peng forced to resign from post.	Shibusawa Eiichi proposes tentative plan. April: Yamabe Takeo authorises to investigate the technicalities involved.
1880	Gong Shoutu & Zheng Guanying appointed as general managers. October: "Regulations on Collecting Shares" published.	July: Yamabe returns to Japan. October: Osaka Spinning Company organised.
1881	Collection of shares completed early in year. August: Danforth arrives in Shanghai. In same year, takes raw cotton to U.S. & Britain	July 1881-November 1882: four workers trained at model mills. October: site for the mill chosen & decision to use steam engines made.
1882	Autumn: Danforth returns and construction of workshops begins but is soon halted.	January: spinning machines & steam engines ordered. June: construction of workshops commences.
1883	September: equipment shipped to Shanghai. Mill suffers severe losses at end of the year & construction suspended for four years.	December 1882-April 1883: equipment shipped to Osaka. January: installation of equipment begins. July: a number of spinning mules begin operation.
1884	February: Zheng Guanying leaves Shanghai.	April: all spinning mules in operation.
1887	Li Hongzhang reorganises personnel at end of the year.	
1888	April: construction resumed.	
1889	April: construction completed. Operation commences December 28.	

Sources: Shanghai Cotton Mill, see text. Osaka Spinning Mill, Unno Fukuju, ed. *Gijutsu no Shakaishi* [A social history of technology] 3 (Tokyo 1982) 147.

<sup>41</sup> Kato, K. 'Takeo Yamabe and the modern cotton industry', in Keiji Nagahara, et al., eds. *Nippon Gijutsu no Shakai Shi* [A social history of technology in Japan] (supplemental 2) (Tokyo 1986) 189-218; Kandaichi, H. *Op. cit.*, 151-52.

In China, however, the construction of the Shanghai Cotton Cloth Mill was postponed from time to time and it took as long as eleven years to complete construction. It took only four years, on the other hand, to complete construction of the Osaka Mill. The slow pace of the Shanghai Mill and the relative success of the Osaka Mill provide an interesting contrast. By explaining some differences between the two mills, an insight as to why China remained backward in the establishment of a modern cotton industry might be attained.

First, there were striking differences between the managers of the two mills. The organizer of the Osaka Mill was Eiichi Shibusawa who after inspecting European countries, took up a major position in the Ministry of Finance. He took part in the financial and economic reforms led by the Meiji Government. In 1873, he resigned from his post to establish Japan's first national bank. Shibusawa was one of the most famous entrepreneurs in modern Japan. Takeo Yamabe, in charge of construction of the Osaka Mill, majored in economics at London University. When he accepted the task of setting up the mills he changed his major to textile technology. He spent time in Lancashire to study the British textile industry and to acquire technical knowledge and managerial experience in the cotton industry.<sup>42</sup> Unlike Eiichi Shibusawa and Takeo Yamabe, Zheng Guanying was once a comprador who had acquired a scanty knowledge on industry in foreign countries. As a patriot, he actively advocated reform and the introduction of technology from foreign countries. He was unaware, however, of the importance of the development of the textile industry.<sup>43</sup> As for the Gong brothers, they were old-fashioned feudal bureaucrats with little knowledge and experience, even concerning the Self-strengthening Movement. Like the Gongs and Zheng, Li Hongzhang, who controlled the Shanghai Mill, possessed little knowledge of textile technology and he was unaware of the urgency of cotton industry development. Thus, it could be said that the managers at the Shanghai Mill were inferior to their counterparts at the Osaka Spinning Mill.

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<sup>42</sup> Kato, K. *Op. cit.*, 195-204.

<sup>43</sup> In his early work *Jiushi Jieyao* [Outline for contemporary relief, 1872], Zheng Guanying did not mention the textile industry. In 1880, he mentioned, in passing, the launching of cotton manufacturing in a chapter of his book *Yiyan* [Words of changes]. At the same time, he had been invited to take part in the preparation for the setting up of the Shanghai Cotton Cloth Mill. In *Yiyan* he devoted special chapters to ships, the telegraph, trains and the mining industry. Thus it can be seen that he did not pay equal attention to the cotton textile industry. After the Shanghai Cotton Cloth Mill went into production and made profits, he wrote on the textile industry in his book *Shengshi Weiyan* [Warning words on the time of peace] (1894) suggesting the setting up of cotton mills in treaty ports and inland provinces. See Xia Dongyuan, ed. *Zheng Guanying Ji* [Collected works of Zheng] 1.

Second, differences in the training of technical personnel between the two countries are also conspicuous. Although the Shanghai Mill had Liang Qiyan accompany A. W. Danforth to the United States to learn textile techniques in 1881, his efforts were too late in coming to be of any help. Therefore, when the mill was under construction, all technical problems had to be solved by Danforth.<sup>44</sup> Japan, however, had cultivated a group of technical personnel by sending students to foreign countries and by running model textile mills. Technical workers at the Osaka Mill trained at these model mills. Takeo Yamabe, who had studied in Britain, was the chief engineer in charge of construction. Until installation of equipment began, W. Nield, an English technician, was invited to guide work at the mill.<sup>45</sup> The construction rate at the Osaka Mill was naturally faster than that of the Shanghai Mill. Japan's cotton industry developed faster due to the country's emphasis on the training of technical personnel. The development of China's cotton industry, however, was restricted, due to a lack of technical personnel. For example, in around 1890, when Zhang Zhidong, Governor-General of Hubei-Hunan at Wuchang, was setting up the Hubei Government Cotton Cloth Mill, construction had to be suspended due to an insufficient number of foreign technicians.<sup>46</sup>

Third, the basic reason behind the suspension of construction of the Shanghai Mill was poor operation and management. I have pointed out above that the mill was run in line with the principles of "guandu shanban". This meant that merchants were responsible for collecting funds and mill operation, while the government sent officials in to control and guide the enterprises. This kind of management method was once used to promote the start of a new type of enterprise. The government's participation was beneficial when collecting funds, in surmounting opposition from conservative forces and in enhancing an enterprise's competitiveness with foreign firms. New type enterprises set up in the 1870's and 1880's were mostly run in line with the "guandu shanban" principle. The authority for decision-making at this kind of enterprise, lay in the hand of the officials who were sent there by the government. Thus, these enterprises were supported by the official circle, but were also encroached upon and extorted by it. The officials also introduced some official pernicious habits of the government and its officials to the enterprises.<sup>47</sup> The Shanghai Mill was

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<sup>44</sup> Sun *Op. cit.*, 1068-69.

<sup>45</sup> Kato, K. *Op. cit.*, 208-09.

<sup>46</sup> Yan *Op. cit.*, 110.

<sup>47</sup> See A. Feuerwerker *China's Early Industrialization* (Cambridge, Mass. 1958) Ch. 1. See also Wang Xi 'Lun Wan-Qing de *guandu shanban*' [On 'guandu shanban' of the late Qing] 1 (*Lishixue* 1979) 95-124.

originally a private enterprise, but Li Hongzhang turned it into a “*guandu shangban*” enterprise. Therefore, while the mill was like a feudal *yamen* (a government office in ancient feudal China) benefitting from favoritism and discriminating against those who held different views, conflicts between the officials and merchants were also conspicuous. The Gong brothers, on behalf of the government, and Zheng Guanying and Jing Yuanshan, representing the merchants, were at odds for quite some time. It was this contradiction between the two sides which suspended the construction of the mill. Later, based on their own experiences, Zheng Guanying and Jing Yuanshan criticized the policy of “*guandu shangban*”. Zheng pointed out that the policy appeared to protect the merchants, but, in fact, it exploited them.<sup>48</sup> After the late 1880’s, the “*guandu shangban*” policy was subjected to increasing criticism.<sup>49</sup> However, Li Hongzhang clung to this policy stubbornly in order to maintain a monopoly on new industries and to expand his own power. This notorious policy was not given up until after the Sino-Japanese War of 1894-94.

If this resulted in the delay of the construction of the Shanghai Cotton Cloth Mill time and again, then Li Hongzhang’s ten-year monopoly of the mill further restricted the growth of a mechanized cotton industry in China. The ten-year monopoly was granted to the mill based on a petition presented by Zheng Guanying. Zheng proposed that Chinese and foreigners should not be permitted to establish cotton industries for the next ten years in treaty port cities. His original intention was to resist foreign attempts to launch cotton mills in China so as to protect the industry run by Chinese people.<sup>50</sup> However, Li utilized this chance to gain a monopoly in the cotton industry by extending the restricted area from the treaty ports alone to China as a whole.<sup>51</sup> This monopoly greatly hindered the development of the cotton manufacturing industry in China. During the decade of the Shanghai Mill monopoly, many attempts by Chinese merchants to establish cotton mills were also thwarted. The only exception was the Hubei Government Cotton Cloth Mill which was tacitly recognized by Li Hongzhang.<sup>52</sup> After the term of the ten-year monopoly expired, Li issued a scheme for developing China’s cotton textile industry in order to continue his monopoly over the new industry. The main contents of this were: reconstruction of the Shanghai Cotton Cloth Mill and changing it to the Huasheng Spinning and Weaving Mill;

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<sup>48</sup> Zheng Guanying *Luofushiheshanren Shigao* [Collected poems] (Shanghai 1909) Ch. 2.

<sup>49</sup> Wang Tao, ed. *Gezhi Keyi Huipian* [Essays of the Shanghai Polytechnic Institution] 13 (Shanghai 1897) 38-48.

<sup>50</sup> *Yangwu Yundong* 7, 484-88.

<sup>51</sup> *Ibid.*, 472-75.

<sup>52</sup> *Ibid.*, 477.



the setting up of ten sub-mills in Shanghai, Ningpo and Zhenjiang; and restricting the scale of the cotton industry in the country to 400,000 spindles and 5,000 looms for the next decade.<sup>53</sup> This was simply a continuation and expansion of the monopoly of the Shanghai Mill, and Li Hongzhang exerted his influence to have the scheme approved by the Qing court. By doing so he therefore set up another obstacle to Chinese national capital investment in the cotton industry. After the Sino-Japanese War of 1894-95, this monopoly was finally broken.

The Qing Government's policy of "guandu shangban" and the ten-year monopoly granted to the Shanghai Mill had their greatest effect on the development of the cotton industry in China during the period of the Self-strengthening Movement. Thus, mistakes of the Qing Government in industrial policy were responsible, to a great extent, for the delayed development of China's cotton manufacturing industry. The delayed construction of the Shanghai Mill was directly responsible for China's delay in introducing cotton textile industry technology. Compared with Japan, in the 1880's China lost good opportunities to develop the cotton manufacturing industry. In the 1890's, with a deterioration in the international and domestic environment, room for development of this new industry became increasingly smaller.

**Table 3. China's Modern Spinning Mills in 1895**

<i>Name of Mill</i>	<i>Locality</i>	<i>Year Commenced Operation</i>	<i>Capital (taels)</i>	<i>Number of Spindles</i>	<i>Number of Looms</i>
Huaxing	Shanghai	1891	450,000	15,000	350
Hubei	Wuchang	1892	800,000	40,592	1,000
Huasheng	Shanghai	1894	800,000	64,556	750
Yuyuan	Shanghai	1894	400,000	25,000	
Yujing	Shanghai	1895	300,000	15,000	
Dachun	Shanghai	1895	400,000	20,392	
<i>Total</i>			3,150,000	180,540	2,100

**Source:** The Editorial Committee of the Economic History of Modern China Series, ed. *Zhongguo Jindai Jingjishi Yanjiu Ziliao* [Research materials on the economic history of modern China] 6 (Shanghai 1987) 87.

Soon after the Shanghai Cotton Cloth Mill went into production, China experienced the first development period of its modern cotton textile industry. In 1892, the Hubei Government Cotton Cloth Mill was established in Wuchang, with 30,440 spindles and 1,000 looms. In addition, by 1895, the Shanghai Cotton Cloth Mill had set up four sub-mills with 67,400 spindles. Meanwhile, another three

<sup>53</sup> *Ibid.*, 478-79.

Huasheng sub-mills (with 88,614 spindles) were under construction.<sup>54</sup> Since yarn spinning was more profitable than cloth weaving, in the early 1890's, a number of spinning mills emerged in China but cloth weaving was relatively overlooked. This shows that China's cotton textile industry was in a period of formation. Unfortunately, the industry was soon severely affected by the Sino-Japanese War of 1894-1895. Due to the huge sum of war reparations of 230 million taels on the Chinese side, it was very difficult for China's cotton textile industry to collect capital to establish cotton mills. Secondly, the Treaty of Shimonoseki, signed after the war, granted foreigners the right to set up factories in China. Foreign businessmen entered the country to set up mills soon after the treaty was signed. In 1897 alone, businessmen from Britain, the United States and Germany built four large spinning mills in Shanghai, with 160,548 spindles. Their capital amounted to about 4.22 million taels. At the same time, the total number of spindles in Chinese-owned mills stood at 234,304.<sup>55</sup> Thus, the new cotton textile industry of China was in an unfavorable situation as it was not only seriously hit by imported yarn and cloth but also squeezed by foreign-owned spinning mills possessing strong capital and technical power. Although the Qing Government abolished the Huasheng monopoly and encouraged the development of private enterprise in the cotton textile industry, after its approval of the Treaty of Shimonoseki, the development of the cotton industry, in fact, was still limited. By 1900, there were 336,722 spindles in Chinese-owned spinning mills, but in the five years from 1896 to 1900, only 73,544 new spindles had been introduced. This was far lower than the growth rate during the years from 1891 to 1895. In 1906, the total number of spindles in Chinese-owned spinning mills had still not reached 400,000, which was a target set for 1904 by Li Hongzhang.<sup>56</sup> Therefore, the Sino-Japanese War of 1894-95 had a dire effect on China's cotton manufacturing industry. It should also be noted that the 1880's was really an opportunity for China to develop its cotton industry, but China missed out. If China's cotton manufacturing industry had been established before the Sino-Japanese War, its modern cotton textile industry may have turned out much differently.

#### 4. Concluding Remarks

Like other industrially underdeveloped countries, China's modern cotton manufacturing industry was typically a "transplanted" industry. This paper discusses, in particular, the role the Chinese government played in establishing

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<sup>54</sup> Yan *Mianfangzhi Shi* 149.

<sup>55</sup> *Ibid*, 134-36.

<sup>56</sup> *Ibid*, 141.

the industry in late nineteenth century China and, at the same time, touches on some of the international factors which had an impact on the birth and development of China's cotton manufacturing industry. The government undoubtedly played a central role in the establishment of the industry, but the influence of international factors cannot be ignored. Impacts from these two factors determined the characteristics of technology transfer in the course of establishing China's cotton textile industry.

China's mechanized cotton textile industry was established to boycott imports of foreign machine-made cotton goods. Since the value of imported cotton cloth was much higher than that of imported cotton yarn in the 1860's to 1880's, China gave priority to importing cloth weaving technology rather than to yarn spinning technology. This was precisely against the proper order for development in the cotton manufacturing industry. Yarn spinning industry was easier to develop than the cloth weaving industry, as yarn spinning technology in the West at the time was fairly advanced, while cloth weaving was relatively backward with low efficiency. Only after the Shanghai Cotton Cloth Mill was established was it found that yarn spinning could earn higher profits than cloth weaving. It was after this that the priority of China's cotton industry shifted from cloth weaving to yarn spinning. Since Japan knew the cotton industry in Britain well, it placed importance on the cotton spinning industry from the beginning, thus avoiding the round about course which China took.

Meanwhile, China's mechanized cotton textile industry was also established so as to resist foreign attempts to set up mills in China. During the time when the Shanghai Cotton Cloth Mill was under construction, foreigners were continuously trying to acquire the right to set up mills in China, but their rights were not legalized until the Treaty of Shimonoseki was signed. The ten-year monopoly of the Shanghai Cotton Cloth Mill was implemented simply to prevent foreigners from setting up mills in China. It was effective as such, but at the same time, it also restricted investment in the cotton manufacturing industry by Chinese merchants also.

This import of technology and industrialization of the cotton textile industry is an example of China's modern industrialization in the late nineteenth century. Due to misjudgments made by the Qing Government in industrial policies, industrialization of the cotton industry in China was delayed. A deterioration in the international environment also restricted chances for development in this new industry in China. The history of China's cotton textile industry in the latter half of nineteenth century showed that the success of technology transfer and industrialization is determined by the comprehensive influences of social, economic and technological factors. In addition, for a

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successful technology transfer to occur, a suitable international environment is essential.