

# Textile of Tang-Song Dynasty

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# 1. Textile Production

## 1.1 Textile Production

Before middle of Tang Dynasty, silk production is developed best in Yellow River, the second best area is in 四川. At the same time, fiber crops cloth is the main levy in South East area. However, during Song dynasty, the development of textile production in South area of China is fast than North area and the core of economy gradually moved to south, although textile in North developed steadily.<sup>1</sup>

In Northern Song, government require more cloth than Tang government did, thus government encourage silkworm rearing and textile since the emperor, 趙匡胤, came in.<sup>2</sup>

A modern research shows that the amount of Song government's cloth levy, which is used on military, negotiate peace, reward and so on, is a very huge number. This research points that that textile industry developed very well in Song Dynasty. Moreover, it considers that textile production is mainly for government use under centralization, however, producing textile for civil market is getting developed.<sup>3</sup>

Another research considers that textile production in 四川 during Song Dynasty developed better than that in Tang Dynasty and Five Dynasty (五代) because of following reasons. First, the place of production spreads. According to some Chinese old books, the number of textile production sites in 四川 increased from 22 to 30 between the Tang and Song dynasties. Also, mulberry tree growth and silkworms rearing spread in whole county. Second, the number of large textile production centers increased from 1 to 2 between Tang and Song dynasties (In Tang, only 成都地區 was a major production center. ) In the new center, silkworm market and other silkworm activity are held, too. Third, the kinds of textile products increase and the quality of products rise.<sup>4</sup>

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<sup>1</sup> 魏天安 (1982),p 100。

<sup>2</sup> 赵承泽 (2002),p 16。

<sup>3</sup> 趙雅書 (1984),p 170。

<sup>4</sup> 贾大泉 (1982),pp 114-117。

## 1.2 Division of textile production in Tang-Song Dynasty

Textile production in Tang-Song Dynasty is divided into three different parts, governmental production, private workshop production and farm family production. In Sui-Tang Dynasty, governmental textile production is with a strict system and the scale of workshop is large. For example, in 武則天's time, there are 365 artisans, 83 workers and 150 workers (two different types of workers) in only a part of governmental workshop. In Song Dynasty, government set large scale workshop in textile-well-developed areas. Thousands of workers were hired in each of the workshops in 杭州, 蘇州 and 成都 by Southern Song.<sup>5</sup> Furthermore, Song governmental workshop is with efficient division of whole production, "in 成都 brocade workshop, there set 54 machines, 64 workers for bending silk, 54 workers for using looms, 21 workers for dyeing and 110 workers for weaving cloth."<sup>6</sup>

Song government also employs 機戶 in civil because the amounts of production in governmental workshop can't meet the demand of government. This productive style (employ 機戶 producing for government) make civil 機戶 become governmental workers and cause 機戶 produce passively because their products can't be sold in the market but for the governmental use.<sup>7</sup>

Some modern scholar consider that governmental handmade industry took most percentage in whole handmade industry in city in feudal society, especially in 夏商周 Dynasty. After 戰國 period, individual handworkers and individual farmers appeared, but the dominant role of governmental handmade industry didn't change until Sui-Tang Dynasty. From Tang-Song Dynasty, private handmade industry was firstly become more important than governmental handmade industry, which is showed that the private handmade industry is developed and starts to challenge the government's position in the textile industry. The government industry also changed their methods of administration.<sup>8</sup>

Private workshop appeared in Tang Dynasty. After middle Tang, private workshop increased with the increase in urban prosperity and commodity circulation, including dyeing workshop, silk weaving workshop, rug workshop and so on. These workshops hire many artisans. These examples tell that handworkers have more choice and

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<sup>5</sup> 赵承泽 (2002),pp 28-29。

<sup>6</sup> 魏天安 (1982),p 104。

<sup>7</sup> 魏天安 (1982),pp 106-107。

<sup>8</sup> 葛金芳 (1991),pp 245-246。

freedom than before.<sup>9</sup> In the capital 開封 in Northern Song, any kinds of workers would gather on the bridge, streets, and markets to wait for employment, which showed that there are many workers who can decide their own masters at that time.<sup>10</sup>

Private workshop developed well in 開封 in Northern Song, and in 杭州 in Southern Song.<sup>11</sup> The main two different characteristics of development on private workshop in Song Dynasty (relative to Tang) are: The number of workshop increase and scale is larger and the employment increases.<sup>12</sup> There is a description recording the textile product in the late Northern Song, "Cloth in capital city and women's clothes, jewels are with seasonal figures such as peach blossom, apricot flowers, lotus flowers, chrysanthemum flowers and plum blossom." General farm family can't produce such clothes with complicated figures and many kinds of cloth.<sup>13</sup> Another example is described private workshop in Southern Song, in 唐仲友's home, who is a official, there are four parts in his silk workshop, including dyeing, printing, weaving and selling.<sup>14</sup>

Private workshop is owned by government officials and rich man, who have financial strength and are powerful. They build workshop in their home, some for their luxury material desire and some for market supply.<sup>15</sup> In Song Dynasty, government put a ban against officials doing business, however, which didn't really work well. It is worth to be mentioned that traditional thoughts, braking development of business, is changed. 李觏, a philosopher in Northern Song, thought that government should positively make policy on business. In Southern Song, there appeared a concept that "four jobs are people's basic jobs — officials, farmers, workers, merchants...workers are good at skill work and they can earn their livelihood by their skill. Merchants are good at trade and they can save accumulate their fortune by trade." This shows some social acceptance of workers and merchants in the Southern Song, which was different from the rigid social hierarchy of pre-Song period, when workers and merchants were considered socially inferior to officials and farmers.<sup>16</sup>

There is another organization called 機戶, which is a part of private production. We will describe 機戶 later. (paste below)

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<sup>9</sup> 赵承泽 (2002),p 16。

<sup>10</sup> 王棣 (2001),p 131。

<sup>11</sup> 魏天安 (1982),pp 107-108。

<sup>12</sup> 王棣 (2001),p 130。

<sup>13</sup> 魏天安 (1982),pp 107-108。

<sup>14</sup> 王棣 (2001),p 131。

<sup>15</sup> 赵承泽 (2002),pp 17-18。

<sup>16</sup> 曹福铉 (2002),pp 358-359。

Handwork is the second career of farm family. Farm family produces cloth for two purposes, one is for government and the other is for self-consuming.<sup>17</sup>

### 1.3 Specialization and Division

From silkworms rearing to getting a sheet of silky cloth, the whole work took many steps: It took 7 days for one worker to remove cocoons from 10 bamboo trays, which were used to raise silkworms. It took 10 days for a worker to turn these cocoons into spools of thread, a process which included cooking the cocoons. From the spools of thread produced, it took a worker 6-12 days to make one sheet of cloth.<sup>18</sup> Thus, specialization is necessary.

According to some description from old Chinese books, we use the appearance of 機戶 as an example to give the idea how specialization and division worked in Song Dynasty.

#### 1.3.1 機戶:

In the middle of Song Dynasty, there are people whose occupation called “機戶”, who have become main producers on weaving.<sup>19</sup> “機戶” mainly appeared in city and the number increased throughout the Song Dynasty. There are different scale of 機戶, small scale 機戶 owns one or two weaving machine, large scale 機戶 owns hundreds of weaving machine.<sup>20</sup> There are four characteristics of “機戶”: First, they are a unit of family. Second, they have almost got rid of ground and farming working. (but some 機戶 only do weaving as their second job.) Third, they have own productive tools, weaving machine. Forth, they earn their livelihood by weaving. Some 機戶 prepare weaving machine and hire labors; some 機戶 hire labors who need to prepare machine by themselves.<sup>21</sup>

Some 機戶 produce cloth for the use of business, which is different with the case in the past that family produce cloth for self consuming and for business if there are surplus. Some 機戶 buy the input and produce output, which means that the appearance of 機戶 in city shows the division between agriculture and manufacture

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<sup>17</sup> 赵承泽 (2002),p 17。

<sup>18</sup> 傅宗文 (1989),p 266。

<sup>19</sup> 葛金芳 (1991),p 246。

<sup>20</sup> 葛金芳 (1991),pp 246-248。

<sup>21</sup> 葛金芳 (1991),p 248。

has developed more in Song Dynasty.<sup>22</sup> In a Chinese old novel “新橋市韓五賣春情”, there is an example to show us that in Southern Song, there was a man open a shop in the city. He sell silk and cotton to 機戶.<sup>23</sup> In addition, there is another example in “嘉泰吳興志”, a Chinese old book, recorded there is a 機戶 owns dozen of acreages of mulberry trees, and hundreds of trays of silkworms.<sup>24</sup> Although in Song Dynasty, some 機戶 still relied on farming to a degree. The thoughts that traditional economic role of farming in a family is major and textile is secondary changed during Song.<sup>25</sup> Moreover, man start to join textile working which was different than the traditional division, “man doing farming working and woman doing textile”.<sup>26</sup>

機戶 can be divided by the different outputs they made into “錦戶” (brocade), “綾戶” (a very thin silk fabric) and so on.<sup>27</sup> Some small cities also start to have a represented function according to their famous production— regional specilization. For example, 白土 City produced gauze. Another example in 蘇杭州, some areas within this region mainly produce rice, while some areas mainly produce cloth. These examples show that specialization happened not only between agriculture and textile, but also across regions.<sup>28</sup>

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<sup>22</sup> 王棣 (2001), p124, 魏天安 (1982),p 104。

<sup>23</sup> 梁庚堯 (1997, 上),p 610。

<sup>24</sup> 斯波義信 (1968),p 284。

<sup>25</sup> 傅宗文 (1989),p 263。

<sup>26</sup> 葛金芳 (1991),p 249。

<sup>27</sup> 魏天安 (1982),p 104。

<sup>28</sup> 斯波義信 (1968),pp 283-285。

## 2. Technology of Textile

### 2.1 The development of cotton growing & The improvement of textile tools (Cotton)

In the beginning of 12<sup>th</sup> century, cotton growing was not common in the south of Yangtze River where mulberry working was flourish. Until the late Southern Song, cotton growing was limited in 閩南 and 廣東 and cotton spinning technology there hadn't improved, moreover, the steps of cotton spinning working hadn't been separated to be specialized, which means that cotton spinning was still done in the household by whole family members and had low-efficiency.<sup>29</sup>

Cotton growing spread out in late Southern Song Dynasty tells not only cotton production skill but planting skill is improved as well. Because cotton is a tropic plant, there should be a shift of planting skill in order to let cotton grow in different environment, such as in most areas of China, where the weather is warm and temperate unlike the hot south.<sup>30</sup>

The introduction of cotton in China occurred a big change of major material of cloth. From the Southern Song, cotton growing spread throughout China while replacing hemp and other fiber crops as clothing material. In the Yuan Dynasty, cotton became a major crop used for clothing on a scale comparable to or greater than that of hemp and other fiber crops for clothing production. In the Ming-Qing period, cotton had completely substituted hemp and other fiber crops for clothing materials.<sup>31</sup>

#### **Following we introduce the improvement of production skill in cotton spinning by its productive process:**

1. The first step is to take off cottonseed so that the ginned cotton can be used for spinning. Before Song Dynasty, people took off cottonseed by hands, and then, in the Song Dynasty, people in some areas start to use iron bar. Afterward, a cotton gin called “木棉攪車” appeared.<sup>32</sup> (following is the figure “木棉攪車”, which was originally showed in 王禎's book “農書”)

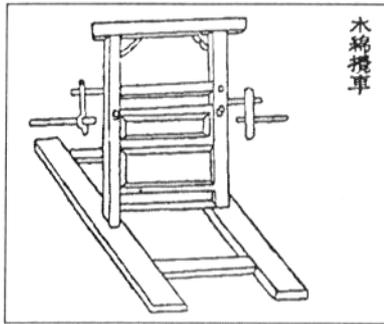
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<sup>29</sup> 赵承泽 (2002),pp 65-66。

<sup>30</sup> 陈维稷 (1984),pp 150-151。

<sup>31</sup> 汪建平等 (1999),pp 393-394。

<sup>32</sup> 赵承泽 (2002),p 151。



<Figure<sup>33</sup>>

According to a Chinese book “農書”(before 1313)<sup>34</sup> written by 王禎 (who was born around 1271)<sup>35</sup> in Yuan Dynasty, the cotton gin is “It is made of wood...two people turn the axles and one person put the cotton into the room between two axles, then the cottonseed will took off from cotton. The efficiency is many times more than using bars.”<sup>36</sup>

2. The second step is to spring the ginned cotton for two purposes: one is to loosen the cotton for easy to be spun; the other is to take off the sand or dirt in the cotton and rise the material of cotton.<sup>37</sup>

In Song Dynasty, people used small bow made by bamboo to spring cotton and the bow string was thin. In the beginning to Yuan Dynasty, the bamboo bow is twice or three times bigger than before, and the strings made of a rope so that the spring power is stronger and the productive efficiency rises.<sup>38</sup> (following figure is a “bow”, which is originally showed in “農書” )

<sup>33</sup> 赵承泽 (2002),p 152 ◦

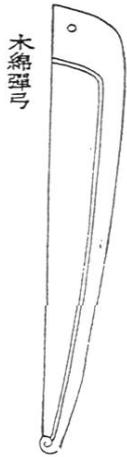
<sup>34</sup> 華覺明 (2004),p 544 ◦

<sup>35</sup> 杜石然 (1997),p 709 ◦

<sup>36</sup> 赵承泽 (2002),pp 151-152 ◦

<sup>37</sup> 陈维稷 (1984),p 154 ◦

<sup>38</sup> 赵承泽 (2002),p 153 ◦



<figure<sup>39</sup>>

After the cotton is sprung, we need to comb the cotton to separate the fibers and make them even and wrap the thread onto spool.

3. The third step is to twist and combine the spools of thread to make it become yarn. This step is the third step and the spinning wheel was got improvement in Song Dynasty, too.<sup>40</sup>

Before Song Dynasty, spinning wheel moved by foot appeared which rise labor's efficiency twice to four time more than hand-moved spinning wheels.<sup>41</sup> However, foot-moving spinning wheel is not suitable to be used on cotton spinning because cotton fiber is short but the speed of wheel turning is fast, which makes tearing cotton easy. A woman, 黃道婆 (who was born in late Southern Song, Middle 13<sup>th</sup> century) improve the spinning wheel by narrowing the diameter of wheel so that the new spinning wheel can be suitable for cotton spinning work.<sup>42</sup>

Ms. Huang was born in a poor family. When she was a teenager, she was sold to be someone's wife. Unfortunately, her mother-in-law and husband abused her. While she could bear anymore, she escaped from this terrible family. Later, Ms. Huang left her hometown, 松江 (now is Shanghai) to Hainan (海南).<sup>43</sup> She learned cotton spinning skill from 黎族 (a main tribe there) and she return hometown around 1295-1296, before Huang returned, cotton growing and production skill was behind Hainan a lot

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<sup>39</sup> 赵承泽 (2002),p 153 °

<sup>40</sup> 赵承泽 (2002),p 87 °

<sup>41</sup> 张春辉等 (2004),p 145 °

<sup>42</sup> 张春辉等 (2004),p 147 °

<sup>43</sup> Website:

<http://zh.wikipedia.org/w/index.php?title=%E9%BB%83%E9%81%93%E5%A9%86&variant=zh-tw>

and people lived in poverty in 松江. Huang taught people new skill and new tools including cotton gin, cotton spring and spinning wheel. Huang also combine 黎族 (tribe)'s cotton weaving style and the silk weaving skill south of Yangtze River to create her own style. Afterward, 松江 become the center of cotton production in China. Huang play an important role in the development of cotton textile in 松江, now there is still a monument in Shanghai, showing that people respect her very much.<sup>44</sup>



<Figure: this is the entrance of Huang's monument. <sup>45</sup>>



<Figure: This is a hall for exhibition of Huang's daily using stuffs and recording her contribution and life story.<sup>46</sup>>

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<sup>44</sup> 赵翰生 (1997),pp 682-684。

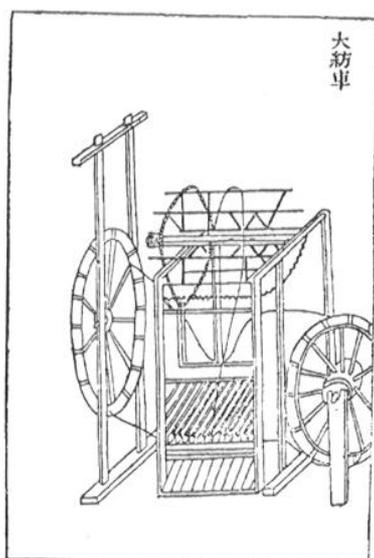
<sup>45</sup> From the website “上海印象”: <http://www.shimpress.com/>

<sup>46</sup> From the website “上海印象”: <http://www.shimpress.com/>

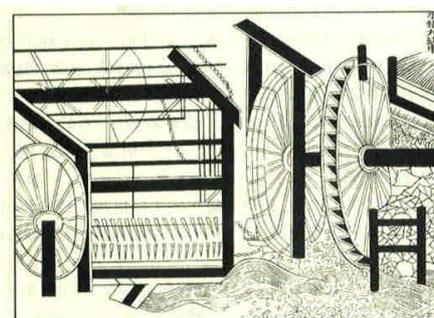
## 2.2 Big Spinning Wheel (大紡車)

Around the Northern Song, the big spinning wheel first appeared. Water powered versions appeared not long thereafter. By Yuan Dynasty, the big spinning wheel was widely used throughout China.<sup>47</sup>

During Tang-Song period, the demand of textile product increased because of the development of society economy and commodity trade. At same time, textile producer appeared, who get away from farming, so that hand-moving and even foot-moving spinning wheel can't satisfy the market. Meanwhile, a machine with 32 spools of thread appeared, called 大紡車 (Big spinning wheel).<sup>48</sup> Following figures are individually Big spinning wheel and water power Big spinning wheel. Two figures are originally showed in “農書.”



<Figure<sup>49</sup>>



<Figure<sup>50</sup>>

大紡車 is used to twist and combine threads into yarn, especially for hemp or other fibers crops. According to 農書 (1313), 王禎 referred that hemp and other fiber crops are mainly grown in the Central plains, 大紡車 are set in the place where water is flowing. 大紡車 is widely used in Yuan Dynasty , therefore, it may start in Northern Song or earlier.<sup>51</sup>

<sup>47</sup> 金秋鹏 (1999),pp 177-178。

<sup>48</sup> 金秋鹏 (1999),p 177。

<sup>49</sup> 赵承泽 (2002),p 150。

<sup>50</sup> 张春辉等 (2004),p 150。

<sup>51</sup> 汪建平 (1999),p 395。

### 2.2.1 Machine Structure:

The length of 大紡車 is around 7 meters, the wide and height are around 1.7 meters.<sup>52</sup> The whole structure of 大紡車 can be divided into three parts:

First is twisting and combining part, including spinning frame, spools, bars to guide the gauze or other fibers. The main characteristic in this part of 大紡車 is the setting of 32 spools of thread so that in some book, 大紡車 also called “32 錠大紡車”.

Second is transmission part including two guiding wheels and transferring belts.<sup>53</sup>

Third is the drive wheel, which included a bamboo wheel with a big diameter. At beginning, 大紡車 work by human power to turn round the bamboo drive wheel. However, turning round the bamboo diver wheel is very power-consuming, so that animal-power and water-power 紡車 appeared soon.<sup>54</sup> 王禎 admired water-power 大紡車 very much, he said “This machine is more efficient and convenient than human or animal power.”<sup>55</sup>

### 2.2.2 Efficiency:

大紡車, especially water-power 大紡車 can do both combination and twisting at same time and hemp production increase. According to estimation, the productivity of 大紡車 (which had 32 spools of thread) is 30~50 times more than past spinning wheel, which only used 3 spools of thread.<sup>56</sup> Another estimation is that the productivity of 大紡車 with 32 spools of thread can compared with 5.4 small spinning wheels each with 5 spools of thread. In 王禎’s book”農書”, a description related to the productivity of big spinning wheel is “Originally, we got 1~3 kg gauze each day. However, we can got 100kg and more gauze one night by using a big spinning wheel.”<sup>57</sup> Moreover, the ratio of speed in combining and twist is steady, the quality of output improves.<sup>58</sup>

Some farmers take their thread to the workshop which owns 大紡車 to twist and

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<sup>52</sup> 刘仙洲 (1962),p 54、金秋鹏 (1999),p 177。

<sup>53</sup> 张春辉等 (2004),pp 149-151。

<sup>54</sup> 张春辉等 (2004),p 151。

<sup>55</sup> 曾雄生 (1998),p 218。

<sup>56</sup> 张春辉等 (2004),p 151。The author cites numerous estimates by other scholars in coming up with this figure.

<sup>57</sup> 赵承泽 (2002),p 174。

<sup>58</sup> 张春辉等 (2004),p 151。

combine them into yearn, and then the workshop return these yarn back to farmer by the weight. Thus, farmer can continue to produce hemp cloth or hemp lines and sale to the market. The appearance of 大紡車 shows that textile technology improved and the output, “hemp yarn”, is standardized.<sup>59</sup>

Water-power 大紡車 is an outstanding developmental achievement in Song Dynasty, however, it's use declined in Ming-Dynasty. There are some reasons why 大紡車 didn't continue spread out and developed. First, the material of clothing is getting to be changed while cotton is introduced in Southern Song.大紡車 is suitable on hemp and silk twisting and combining (big size for hemp; small size for silk) because their fiber is stronger than cotton. While the cotton growth increase and hemp growth decrease, the importance of 大紡車 falls, too.<sup>60</sup> Second, water-power resource is not common in some areas.<sup>61</sup>The third one is about the limitation of environment. In Song-Yuan Dynasty, there appeared some larger scale workshop for hemp production, so that application of 大紡車 is necessary. After Yuan Dynasty, the production of hemp decreased rapidly, especially in the North area. In addition, cotton production at this time is composed by family and some small-scale workshop in the city.<sup>62</sup>

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<sup>59</sup> 陈维稷 (1984),p 187。

<sup>60</sup> 赵承泽 (2002),pp 168-169、汪建平等著 (1999),p 395。

<sup>61</sup> 陈维稷 (1984),p 108。

<sup>62</sup> 赵承泽 (2002),p 176。

## 2.3 Other productive technology in textile:

### 2.3.1 Mulberry tree grafting

After 北魏 Dynasty, and during 隋 and Tang Dynasty, the technology of propagation of mulberry tree stopped at the seed growing and layering (botany term—according to dictionary, layering means “to form roots where a stem comes in contact with the ground”).<sup>63</sup> Around late half of the Northern Song, farmers in south area of Yangtze River invented grafting skill of mulberry tree, which is a big revolution in cultivation of mulberry tree. This also increased the development of silk production.<sup>64</sup>

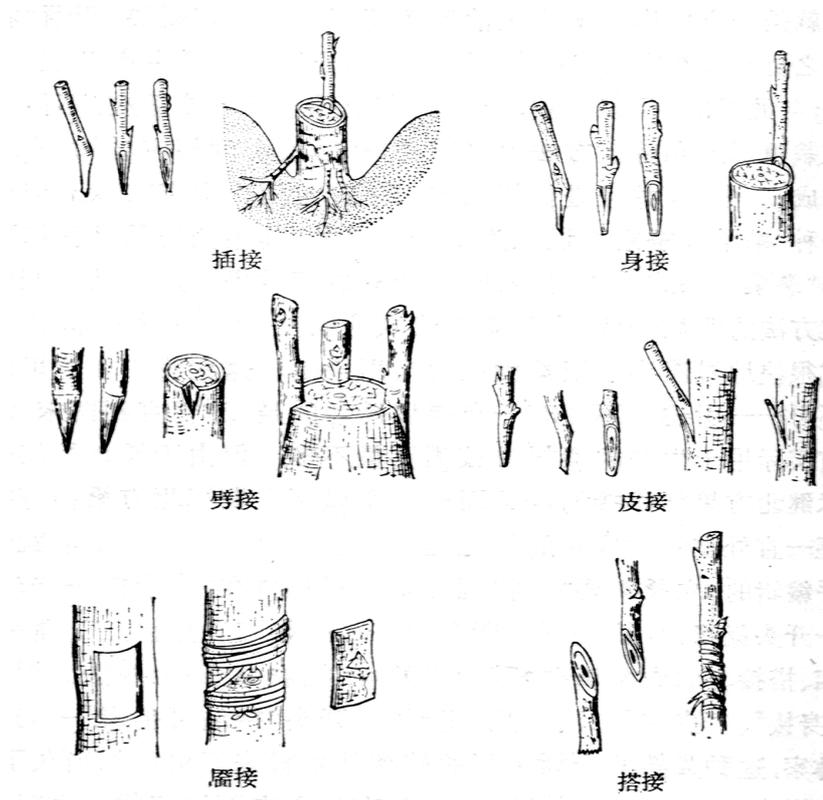
Grafting is a kind of propagating method with a theory of agamogenesis (reproduction without sexual union as in budding.), which used on several purposes including old mulberry trees re-strong, keeping good character of trees, speed up the propagation of mulberry tree seed and cultivation of good species. In the old Chinese book “農書” written by 陳敷 in Song Dynasty (not same as Wang Zhen’s Nung Shu), there appeared some clear descriptions of mulberry tree grafting skills: “Choosing healthy mulberry tree connect with original one and cutting in 3 or 4 寸 (a unit of length equal to one-third decimeter.)....” In addition, in 農書 by 王禎 in Yuan Dynasty, he introduces six method of grafting which are 身接、根接、皮接、枝接、壓接 and 搭接 (Figure shows below). Moreover, 王禎 introduced the advantage of these methods. It is worth to be mentioned that 王禎 refers that “荆桑 (a specie of mulberry tree) 可接魯桑 (another specie of mulberry tree)”, which show that people graft two different species of mulberry trees to improve the character of mulberry tree.<sup>65</sup>

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<sup>63</sup> 周匡明 (1983),p 203。

<sup>64</sup> 葛金芳 (1991),p 262。

<sup>65</sup> 陈维稷 (1984),p 120-121。



<Figure<sup>66</sup>>

In addition, a reference in Southern Song recorded “拳桑”, which was any kind of mulberry tree which was cut into a particular shape in order to increase the number of mulberry trees that could be raised on a plot of land (e.g. some trees were cut and grafted together).<sup>67</sup>

Grafting skill increased the species of mulberry tree. In the end of Song Dynasty, there are 8 or 9 species recorded in references and the amounts of species continued increasing in Ming and Qing Dynasty.<sup>68</sup>

<sup>66</sup> 周匡明 (1983),p 206。

<sup>67</sup> 周匡明 (1983),p 205。

<sup>68</sup> 周匡明 (1983),pp 209-210。

### 2.3.2 Raising Silkworms

Before Song, Chinese had noticed silkworm sick (蠶病) and had knew method to prevent this sickness. During the Song, research progressed on preventive measures to avoid silkworm sickness and silkworm farmers have knowledge that disinfection on rearing tools is very important during whole silkworms raising process in Song Dynasty. Following description shows the steps of disinfection on rearing tools, which was recording in the book “蠶桑要旨” (published in Jin-Yuan Dynasty). ”at the bottom of bamboo trays, put two paper or cloth or other material. When silkworms were born, take one of the paper or cloth or other material out to dry in the sun. Reset Sunned paper in the bottom of bamboo trays and take the other paper or cloth or other material out to dry in the sun next day.” This is a application of solarization.<sup>69</sup>

Choosing good and strong species and then raising them is a way to rising the quality of species of silkworms and rising the quality of silk. There are some instructions related to choosing good quality of species of silkworms. In Chinese old book, “陳敷農書” (published in late Northern Song Dynasty), there is a description that “the process of raising cocoons, moth, silkworm eggs and silkworms is related to the result of quality of silkworms. Having a fixed sleeping time every day is important for raising good silkworms.”<sup>70</sup>

After silkworms become cocoons, there are several steps before getting the silk, including taking cocoons, selecting cocoons for silk production, selecting cocoons for further breeding, preserving cocoons and killing pupa. From, 戰國 period, the skill of domestic cocoon raising improved, however, the skill of raising wild cocoon (a different species) did not mature until Song-Yuan Dynasty.<sup>71</sup>

Wild cocoon rearing is more complicated than domestic cocoon rearing. In Song Dynasty, people have overcome the difficulty and developed a system of wild cocoon rearing. Song people know another way to take silk form wild cocoons, which is soaking the cocoons in vinegar.<sup>72</sup>

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<sup>69</sup> 陈维稷 (1984),p 124。

<sup>70</sup> 周匡明 (1983),p 167。

<sup>71</sup> 陈维稷 (1984),p 126。

<sup>72</sup> 陈维稷 (1984),pp 128-129。

### 2.3.3 Technology of Ramie Cloth Production

Ramie is originally grown in the south of China. In Song Dynasty, the growth of ramie moves north. According to a Chinese old book, there is a description which is described the high quality of ramie cloth in 靜江府 (south area) and the skill people there used for ramie cloth production, "Burning rice straw into dust and adding the dust into ramie and then cook them. Then, smear the cooked ramie cloth with a particular lime. The ramie cloth will finally be strong."<sup>73</sup>

After Southern Song, the growth of ramie declined while cotton became widespread. However, cotton can't completely replace ramie cloth because ramie cloth is good at absorbing moisture and breaths well and cotton does not have these characteristics.<sup>74</sup>

### 2.3.4 Dyeing Technology

While technology of textile production is developed, dyeing technology is also improved at Song Dynasty. Plants which were used as color dyes were commonly grown in countryside, such as blue grass, red flowers, yellow foxgloves, and so on. Labors created skill that improving the material of silk to make it easy for dyeing. There is an example in a Chinese old book that "A man took many kinds of cloth home, and meet a plum rains on his way home. He found that only the cloth made in 四川| didn't fading."<sup>75</sup>

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<sup>73</sup> 周藤吉之 (1962),pp 351-352。

<sup>74</sup> 赵承泽 (2002),p 135。

<sup>75</sup> 贾大泉 (1982),p 117。

## 2.4 The Development of Textile Tools

During Qin-Han Dynasty to Ming-Qing Dynasty, textile tools improvements included: spinning wheel and a machine which is used to taking out the silk while cocoons are cooked are changed from hand-moving to footing-moving, spinning wheel is also changed from single spools setting to complex spools settings, spinning wheels is change from human-operating to water-power and animal-power and weaving machine become more complicated. These improvements rise both quantity and quality of textile output.<sup>76</sup>

Before Song, there was an improvement of machine which was used to take out the silk while cocoons are cooked. (Chinese name is 纛車) 纛車 is set on the top of pot which cocoons are soaked in or are cooked in. The process of silk-taking is drawing three thin silks from pot and across a hole (錢眼) to gather the silks, then winding silks around a big spool.<sup>77</sup> Hand-moving 纛車 takes two people working. One person throws the cocoons into the pot and looked for the head of silk and so on. The other person turns around the big spool and so on.<sup>78</sup>



<Figure<sup>79</sup>: hand-moving 纛車>

Foot-moving 纛車 is getting replaced hand-moving 纛車 when it appeared by Song-Dynasty. Foot-moving 纛車 only took one person working and the efficiency rise.<sup>80</sup>

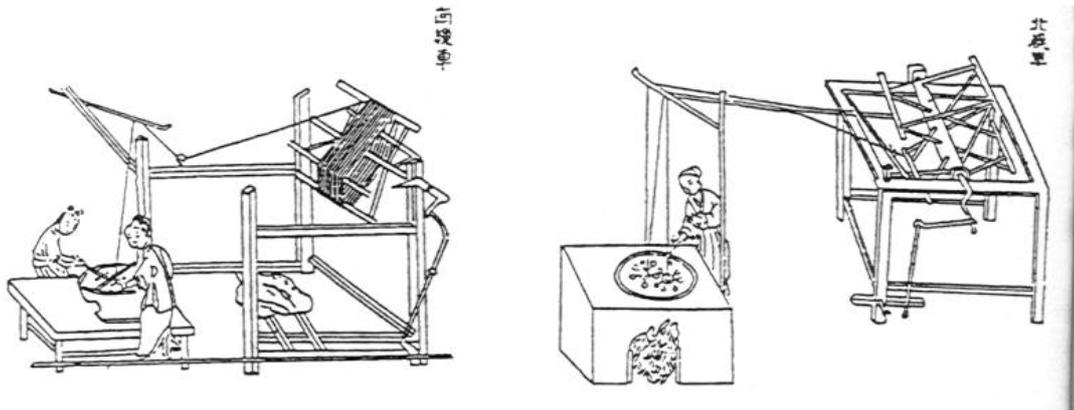
<sup>76</sup> 张春辉等 (2004),p 123。

<sup>77</sup> 赵承泽 (2002),p 160。

<sup>78</sup> 张春辉等 (2004),p 139。

<sup>79</sup> 陈维稷 (1984) , p 162。

<sup>80</sup> 赵承泽 (2002),p 158。



<Figure<sup>81</sup>: Foot-moving 纛車 in South and North China. This figure is originally in 王禎 ”農書”.>

Next, we introduce the improvement of spinning wheels. Foot-moving spinning wheels appeared before Song Dynasty and widely used in Song-Dynasty.<sup>82</sup> A Worker treads upon a pedal and the wheel moves, at same time work can operate more than one spool of thread by hands. As estimation, the productivity of foot-moving spinning wheels with multiple spools is twice to four times more than hand-moving spinning wheels with single spool.<sup>83</sup>

<sup>81</sup> 赵承泽 (2002),p 160。

<sup>82</sup> 葛金芳 (1991),p 239。

<sup>83</sup> 张春辉等 (2004),p 145。

### 3. Others

#### 3.1 Silkworms Market:

In 成都 City in Song Dynasty, there were many kinds of market which were took place in different area by times. For example, according to “成都古今記”, a Chinese old book, festive lantern market is held in January, flower market is in February, Silkworms market is in March, brocade market is in April, fan market was in May and so on. Among these market, silkworms market, medicine market and treasure market are related to people’s lives most.<sup>84</sup>

Following, we introduce silkworms market in Song Dynasty.

Silkworms market is a kind of seasonal fair which provides not only tool, input in farming and mulberry works but also flowers, fruits and medicine.<sup>85</sup> According to description related to silkworms market, which is recorded in some old books, silkworms market was took place in different streets in 成都 City eight times one year: at 州南門 (a city gate ) in January 5<sup>th</sup>, at 經壽寺 (a temple ) in January 22<sup>nd</sup>, at 寶歷寺 (a temple) in 2<sup>nd</sup> February, at 大慈寺 (a temple) in 8<sup>th</sup> and 15<sup>th</sup> February, at 龍橋 (a bridge) in 3<sup>rd</sup> March, at 大慈寺 (a temple) again in 9<sup>th</sup> March and at 睿經夫人廟 (a temple) in 27<sup>th</sup> March. 成都 government held “Silkworms market” frequently because farming was the most important thing in 成都, so that when the spring comes, government would held silkworms market for the purpose that people can buy tools and input for productive need such as different kinds of silkworms species, tools for raising silkworms, mulberry tree seeding and silk thread.<sup>86</sup> Moreover, farmers can exchange their experience on farming and textile working in the market and it promotes improvement of production.<sup>87</sup>

In Song Dynasty, the silkworm market was a retail market. Because merchants also sold silkworm stuffs to distant village and countryside residents, the silkworm market was also a wholesale market.<sup>88</sup>

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<sup>84</sup> 傅宗文 (1989),pp 209-210。

<sup>85</sup> 鞠清遠 (1936),p 28、陈国堂 (2001),p 49。

<sup>86</sup> 张金花等 (2006),p 111。

<sup>87</sup> 傅宗文 (1989),pp 210-211。

<sup>88</sup> 鞠清遠 (1936),p 33。

### 3.2 Middle Men

After giving government the products and satisfying self, farm family will sold their products for business. Between farm family (producers) and consumers in city or government, there are middle men to deal with the circulation of commodities. Here we introduce a kinds of middle man “牙人”, who are in charge of the circulation between farm family and businessman, or between businessman and shop. First case is business may give money for 牙人 to request him build a warehouse for storing products which are bought from farm family. Second case is that business may entrust another 牙人 to look for good shop to sell them the products. Business can have many 牙人 for deal with the business in different areas.<sup>89</sup>

牙人 government licenses, which is a assurance of their business ship. There are several roles relating to 牙人’s duty.<sup>90</sup>

First, 牙人 can’t trade commodities which are not government authorized (taxed). Authorized products are stamped with a government mark or seal. Second, if seller and buyer can make bargain by themselves, 牙人 can’t obstruct them. Third, 牙人 can’t rise the price or postpone the bargain time. If the business uses credit, 牙人 must make a clear contracts with deadline, price on it, and have to look for guarantors.<sup>91</sup>

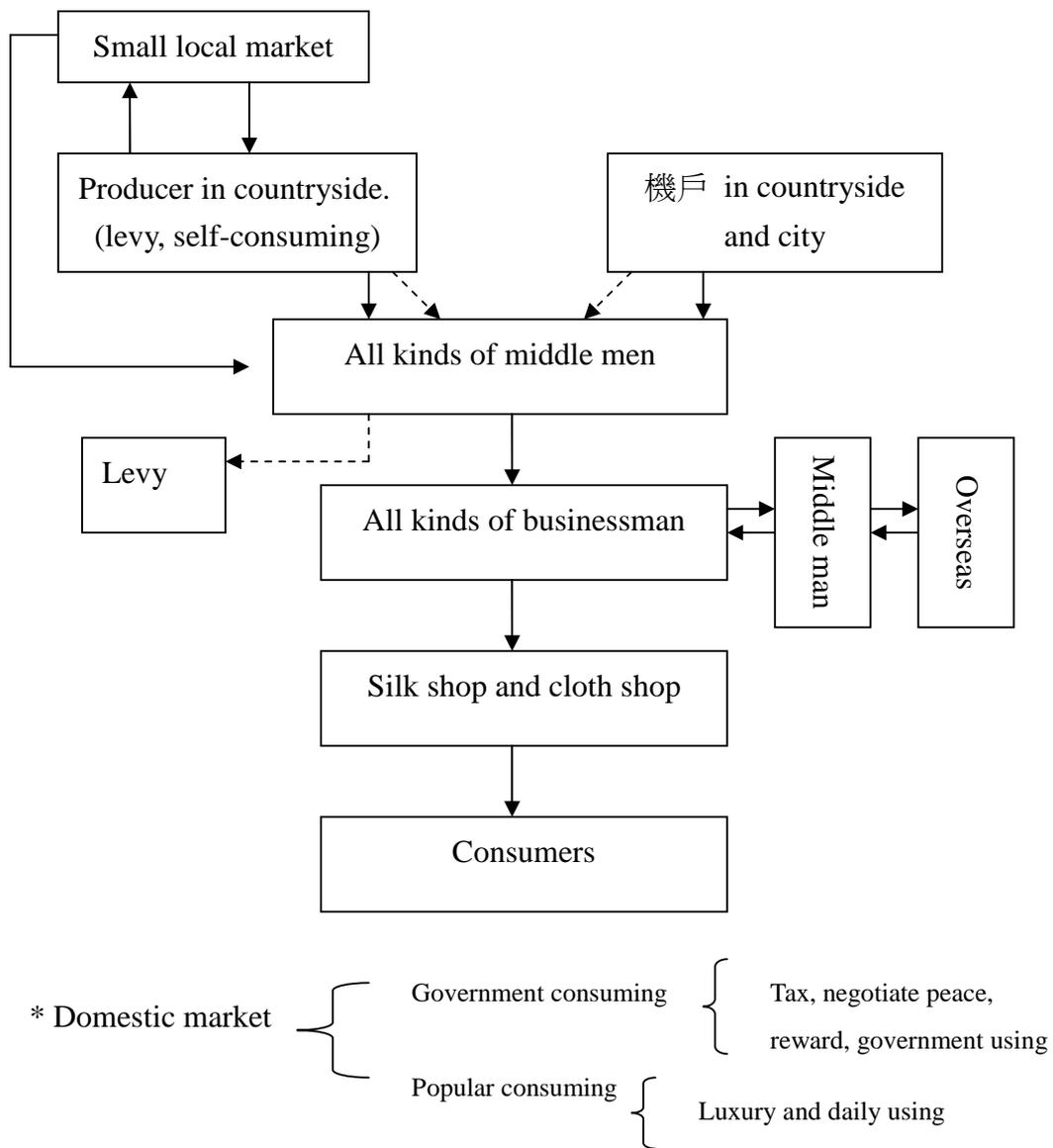
Following is a figure showing the circulation of textile products from productive place to market.

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<sup>89</sup> 周藤吉之 (1962),pp 353-357 ◦

<sup>90</sup> 周藤吉之 (1962),pp 354-355 ◦

<sup>91</sup> 周藤吉之 (1962),pp 354-355 ◦



\* Overseas (Liao, Jing, Japan, 大理, 高麗, 西夏, 西羌, 南海)

<Figure<sup>92</sup> >

<sup>92</sup> 斯波義信 (1968),p 291。

### 3.3 The background of 行 During Tang-Song dynasty

During Tang-Song dynasty, the system of cities and administrative centers rapidly changed. The closed city system which established in Tang Dynasty was broken, while some new cities and towns near rivers, bridges and the city gates developed and a vivid city living style follows. There are many reasons which caused the historical change. One of the main reasons is the rapid increase of population in city. When population rose, the demand of their daily necessary goods rose, too. Then, the development of business, trade caused many kinds of industries appeared. The number of 行 increases.<sup>93</sup> The meaning of 行 become different with previous dynasty. In Tang Dynasty, most of the “行” were regional organization (i.e. based on location), but “行” in Song Dynasty was meant an industrial organization (independent of location).<sup>94</sup>

#### 3.3.1 行 in Tang Dynasty

行 may be the original organization which was called 會館 or 公所 in Ming-Ching Dunasty.<sup>95</sup> There are not many references describing the beginning time when 行 appeared. However, there are some references which described the distribution of 行 in some particular areas in Sui Dynasty. References which recorded 行 in Tang Dynasty supported the idea that 行 was not only referred to the unit of business areas where stores which sell same commodity were gathering but also the industrial category. For example, Eastern market (東市) and Northern market in 長安 city consisted by 120 行 and there were many industrial category recorded in references in Tang Dynasty such as 肉行, 鐵行, 太衣行, 藥行, 絹行 and so on.<sup>96</sup> According to system of Tang, there was a plate which was written the title of 行 setting before every entrance of 行.<sup>97</sup> Some areas which was named with 行 such as 蔥行橋 (which might meant the bridge where 蔥行 was located) and 竹行橋 (which might meant the bridge where 竹行 was located).<sup>98</sup>

In Tang Dynasty, there established Eastern market (東市), Western market (西市), Southern market (南市), Northern market (北市) in each of two capitals and some large counties. Moreover, there are some small markets periodically held but only

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<sup>93</sup> 楊寬 (1993),p 248。

<sup>94</sup> 王棣 (2001),p 142。

<sup>95</sup> 加藤繁 (1952),p 423。

<sup>96</sup> 加藤繁 (1952),pp 426-427。

<sup>97</sup> 加藤繁 (1952),p 429。

<sup>98</sup> 加藤繁 (1952),p 430。

limited in their area. In addition to stores, there were warehouses established in markets (市). The system and structure of markets in cities is closed, organized and steady. Stores open in sunrise and close in sunset.<sup>99</sup> However, the situation in the end of Tang Dynasty began to be different, there were other stores which set up in different locations — not only the designated area.<sup>100</sup>

### 3.3.2 行 in Song Dynasty

From the end of Tang Dynasty, the system (setting stores into particular places) began to be destroyed. 加藤繁's opinion was that this system which was followed from 秦 Chin Dynasty to Tang Dynasty was totally break down some time after the middle of Northern Song.<sup>101</sup> The way of stores (stores in a 行) distribution could be divided into two kinds. First kind was that stores were asked to be set in some particular areas, such as in some markets (市) and their movement was limited. The other kind was that stores were able to be set without locational limitation.<sup>102</sup> In Song Dynasty, there was no limitation whether on the trading place, trading time. Stores can independently be built inside or outside the capital. Periodical markets were able to held in not only their region, but the side of river, under the bridge and transportation-well-developed places. Warehouse is setting randomly in the city.<sup>103</sup>

In Song Dynasty, markets which were hold by same 行 could divided by trading time, commodities, participating people and location. We introduced them below.<sup>104</sup>

By trading time:

- (1) Daily markets. Such as fruit 行 in 開封 (開封的果子行), rice market in 臨安 (臨安的米市), and fish 行 where sold daily necessary goods.
- (2) Once ten days. Or several times in ten days. Such as markets at 相國 temple in 開封 (開封相國寺的市), where sold daily necessary goods, and luxury goods.
- (3) Several times a year. Such as medicine markets in 成都 (成都的藥市), silkworms markets (蠶市), where sold luxury goods, and productive tools.

By commodity:

- (1) Market where selling particular commodity. Such as 米市, 藥市, 蠶市 and so

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<sup>99</sup> 加藤繁 (1952),pp 374-375。

<sup>100</sup> 加藤繁 (1952),p 433。

<sup>101</sup> 加藤繁 (1952),p 430。

<sup>102</sup> 加藤繁 (1952),p 430。

<sup>103</sup> 加藤繁 (1952),p 375。

<sup>104</sup> 加藤繁 (1952),pp 375-377。

on.

- (2) Market where selling many commodities. Such as markets at 相國 temple in 開封 (開封相國寺的市).

By participating people:

- (1) Businessmen (商人同志), wholesale traders and so on. Such as rice market in 臨安 (臨安的米市), and fish 行.
- (2) General businessmen and general people. Such as markets at 相國 temple in 開封 (開封相國寺的市).

By location:

- (1) Markets which were hold in 行's location. Such as fruit 行 in 開封 (開封的果子行).
- (2) Markets which were hold in streets, river sides, near the city gates.
- (3) Markets which were hold in front of temple. Such as 開封相國寺 and 成都玉局觀.<sup>105</sup>

While the traditional system was destroyed, the system of markets is getting opened, businessmen belonged to the same industry worried about their monopoly rights which they enjoyed in Tang Dynasty when central government limited the openness of markets and admitted these businessmen's monopoly rights. These businessmen from the late Tang were eager to organized their 行 in order to protect their monopoly rights. Therefore, from sometime after the middle of Tang Dynasty to sometime after the middle of Song, when the system of markets (市) was gradually destroyed, 行 was well-developed.<sup>106</sup> Categories of 行 were divided into more numbers and the specializations was shaped obviously. Moreover, the organization “行會” was getting systematical.<sup>107</sup>

### 3.3.3 The category of 行

The category of 行 increased in Song Dynasty. According to the record from Southern Song, there were many categories of 行 in the capital city, which were more than that in Northern Song. Also both inside and outside of the capital city the 行 were more widely distributed during Southern Song than in Northern Song and

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<sup>105</sup> 加藤繁 (1952),pp 375-377。

<sup>106</sup> 王棣 (2001),p 139, 加藤繁 (1952),p 443 (Both the authors viewed the 行 from the late Tang as being organized by businessmen to protect their monopoly rights.)。

<sup>107</sup> 王棣 (2001),p 139。

their social and economic impact were even greater.<sup>108</sup> We divided these industries into three categories, daily goods, handwork and labor.

First category is daily goods, including fish 行 (魚行), meat 行 (肉行), fruit 行 (青果行), vegetable 市 (菜市), crab 行 (蟹行), and in summer iced foods 行 (涼水, such iced sweet green beans and lizhi jelly). Business in this kind of 行 mainly did the trade of goods. There also were comb 行 (方梳行), clothes 行 (布行) and flower 行 (花團), bookstore 行 (書房), antique 行 (骨董行) and furniture 行 (金漆桌凳行).<sup>109</sup> There also was a title “銀行街” appeared in Chinese old references which described the society of Song Dynasty. 銀行街 might refer to a street where many 銀行 located. However, 銀行 might not refer to the bank but refer to “銀商店” (store selling silver-making goods).<sup>110</sup>

Second category is handwork, which was mainly providing service. This 行 also called “作”. For example, there were shoes making 行 (雙線行), painting 行 (漆作, including house painting service and also painting items), sewing 行 (裁縫作), printing store 行 (打紙作) and nailing 行 (釘鉸作).<sup>111</sup>

Third category is labor. The function of this 行 was mainly to provide human resource for market. The leader of 行 (also called 行老) would guide the labor to employers. In Southern Song, if employers needed any kind of skilled workers, they had to ask for assistance and approval of the leader of 行. For example, actors for performances.<sup>112</sup>

According to some description from old Chinese books, there appeared beggars 行 (乞兒行) and schools 行 (教學行), which was indicated a place which beggars or schools gathered in. These were less formal and less organized groups, and probably better described as associations (not guilds).<sup>113</sup>

Between 行 and 行, there were some interactions, for example, they would offer sacrifice to Buddha together. Each 行 offered different goods and food in this sacrifice, for instance, 七寶行 provided 七寶 (utensils which used in sacrifices),

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<sup>108</sup> 楊寬 (1993), p 376。

<sup>109</sup> 楊寬 (1993), pp 376-378。

<sup>110</sup> 加藤繁 (1952), p 431。

<sup>111</sup> 楊寬 (1993), p 382。

<sup>112</sup> 楊寬 (1993), p 383。

<sup>113</sup> 加藤繁 (1952), p 431。

青果行 provide fruits, and 魚兒活行 provided fish.<sup>114</sup>

There is one more thing have to be mentioned that the there could be more than one 行 in a capital city. For example, in Tang Dynasty, there were Eastern market (東市) and Western market (西市) in 長安 capital city. Both markets had same kinds of 行. There could be two independent organizations of one kind of 行 with two leaders, and the two organizations have authority of monopoly on business. However, these two organizations could actually become one organization with one leader. This situation happened especially in Song Dynasty, after the 市 system was destroyed, one organization among them might unified the other one.<sup>115</sup>

### 3.3.4 行會 (Guild. Leadership organization within 行)

#### 3.3.4A The development of 行會

People in 行 established their leadership organization which some people of in Song Dynasty called 行.<sup>116</sup> Modern scholars today call this organization 行會. 行會, is a civil organization and also called “市” and “團行”.<sup>117</sup> The main function of 行會 is to organize businessmen with same industry into group to protect the interests of the group and better their welfare. 行會 probably appeared before Tang Dynasty. Then, in Song Dynasty, 行會 was getting important, well-organized and the number increased.<sup>118</sup>

After mid-Tang Dynasty, especially in Song Dynasty, 行會 had become a kind of monopoly organization through handwork industry and business industry, and was established into most of industry.<sup>119</sup>

#### 3.3.4B The system and function of 行會

Each 行會 has their own system to operate. For example, each 行會 has a particular gathering place. Some 行會 even has particular language (unique ways of saying things by members of the group — names of things or descriptions), clothing,

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<sup>114</sup> 加藤繁 (1952),p 441。

<sup>115</sup> 加藤繁 (1952),pp 446-447。

<sup>116</sup> 加藤繁 (1952),p 433。

<sup>117</sup> 葛金芳 (1991),p 252。

<sup>118</sup> 王棣 (2001),p 139。

<sup>119</sup> 葛金芳 (1991),p 252。

organization symbol, and their special day.<sup>120</sup> The modern scholars, 戴靜華, 楊德泉, pointed out that the system of 行會 is like a hierarchy system transferring from countryside or rural areas to city. There are some characteristic of 行會: 行會 is controlled strictly by government. The governing rules within the 行會 among its members were also strict, but less so than the government rules. (i.e. 行會 rules are more flexible than government rules.) Also, rich businessman is a dominant role in 行會.<sup>121</sup>

Here are some functions of 行會:<sup>122</sup>

First, set and standardize the price of commodity. We took a sentence from an old Chinese book as an example, “Stores took this price of rice, which was made by the leader of 行會.”

Second, disallow other people with same industry entering the market in order to avoid their competition.

Third, manage the demand from government, called 科索. The supplies have to be fit with the definition from government. Government will pay the price lower than market price. Sometimes, government will bully them. However, after the policy, 免行錢 is established in 1073, the situation improved. We will introduce 免行錢 below.<sup>123</sup>

However, in Song Dynasty, not all businessmen could enter 行會. Some poor and small business probably were not able to enter 行會. (i.e. 行會 was exclusionary at times).<sup>124</sup>

Although the purpose of establishing 行會 might to protect businessmen in the same industrial category from losing their rights. The purpose that government supported establishment of 行會 might be that government could control businessmen by 行會 and got more tax. 行會 had to contribute goods to government and accomplish duties which government asked them to do.<sup>125</sup> Sometime government would taxed 行 goods

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<sup>120</sup> 葛金芳 (1991),p 253 , 漆俠 (1988),p 970 。

<sup>121</sup> 葛金芳 (1991),p 253 。

<sup>122</sup> 漆俠 (1988),pp 970-973 。

<sup>123</sup> 漆俠 (1988),pp 970-973 。

<sup>124</sup> 加藤繁 (1952),p 435 。

<sup>125</sup> 王棣 (2001),p 140 。

heavily, buying their goods with price lower than market price.<sup>126</sup> Moreover, government would ask people who transported goods to government to do other works and picked fault of provided goods. For example, a references recorded that “Recently, vice-ministers of 三司 punished twenty people because of the low quality of shoes fur (靴皮).”<sup>127</sup> With this background, 免行錢 was created. Before 王安石’s reform, there was a man, called 徐中正, who was belonged to 開封 meat 行 (肉行). 徐中正 gathered several powerful people and was supported by businessmen in each 行, then he suggested government that changing tax goods to tax money, which meant that instead of giving goods every month or season, 行 changed to contribute money, called 免行錢, which was the conversion from the regular goods by market price. 徐中正’s idea was accepted by government. The adoption of 免行錢 was spread widely from 熙寧 8<sup>th</sup> year (1075) to 元豐 8<sup>th</sup> year (1085), with the number grew in 開封. However, 免行錢 was abolished in the end of 紹興 year (紹興: 1131~1162) in Southern Song. Monetary system might be the reason.<sup>128</sup>

### 3.3.4C 行老 (行頭、行首)

Leaders of 行會, called 行老 during Tang-Song Dynasty (it is called 行頭 and 行首 in Tang Dynasty), whose position was taken took by big businessman (大商人) in 行會. The leaders have four main duties: First, they are represented to manage affairs with government. Second, they are represented to develop business. Third, they help government control 行會. For example, when sheriff was appointed into a new county, he will appointed 行老 in tea house (茶房), wine house (酒肆), prostitute place (妓館), restaurant (食店), 櫃坊, 馬牙, 解庫, (silver stores)銀舖 and hotel (旅店). These 行老 could provided information for officials. Moreover, if 行老 concealed the truth, he would be punished heavily. For example, if 行老 concealed the crime person’s hiding place, 行老 would be punished.<sup>129</sup> The forth duty is also the main one ,they manage the 行會. They regularly gather to discuss the affairs in 行會, such as the division of rights of location of businesses, the right and obligation of members, and intermediate the arguments between members.<sup>130</sup>

The serving period of 行老 was different by industry. For example, serving period of 行老 in 米行 might be the shortest, one round every ten day (一旬). 加藤繁’s opinion is that 行老 was not a powerful person in 行會 but a person who was

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<sup>126</sup> 加藤繁 (1952),p 438。

<sup>127</sup> 王棣 (2001),pp 141-142。

<sup>128</sup> 加藤繁 (1952),pp 438-439。

<sup>129</sup> 加藤繁 (1952),pp 436-437。

<sup>130</sup> 王棣 (2001),pp 142-143，加藤繁 (1952),p 437。

sometimes appointed by government (not all 行老 were appointed by government. Government would appointed 行老 in some particular industry or places where crime people would hide easily.). Generally speaking, 行老 was a person who has to manage routine works and followed powerful people's ideas and official's request.<sup>131</sup>

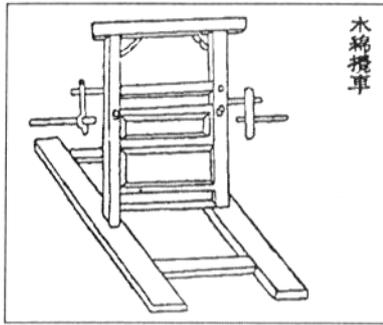
In short, system of 行會 was well-developed. 行會 was a civil organization, that was able to protect 行 members from government squeezing, but 行會's force was limited. It is worth to be mentioned that 行會 was able to avoid and constrain the competition in commodity market, which brought bad effect on the development of productivity.<sup>132</sup>

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<sup>131</sup> 加藤繁 (1952),pp 447。

<sup>132</sup> 王棣 (2001),p 144。

## Figures



<Figure<sup>133</sup>>



<figure<sup>134</sup>>



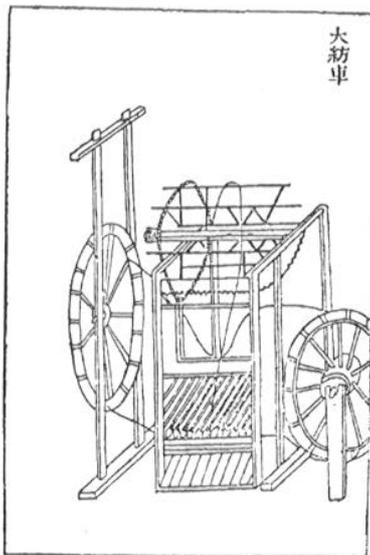
<Figure<sup>135</sup>: this is the entrance of Huang's monument. >

<sup>133</sup> 赵承泽 (2002),p 152 ◦

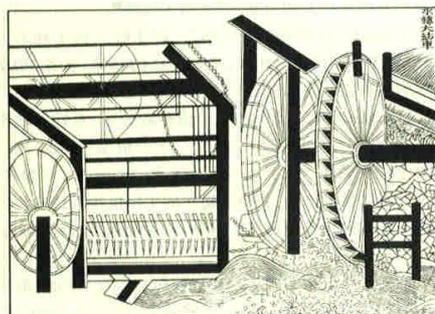
<sup>134</sup> 赵承泽 (2002),p 153 ◦



<Figure<sup>136</sup>: This is a hall for exhibition of Huang's daily using stuffs and recording her contribution and life story. >



<Figure<sup>137</sup>>

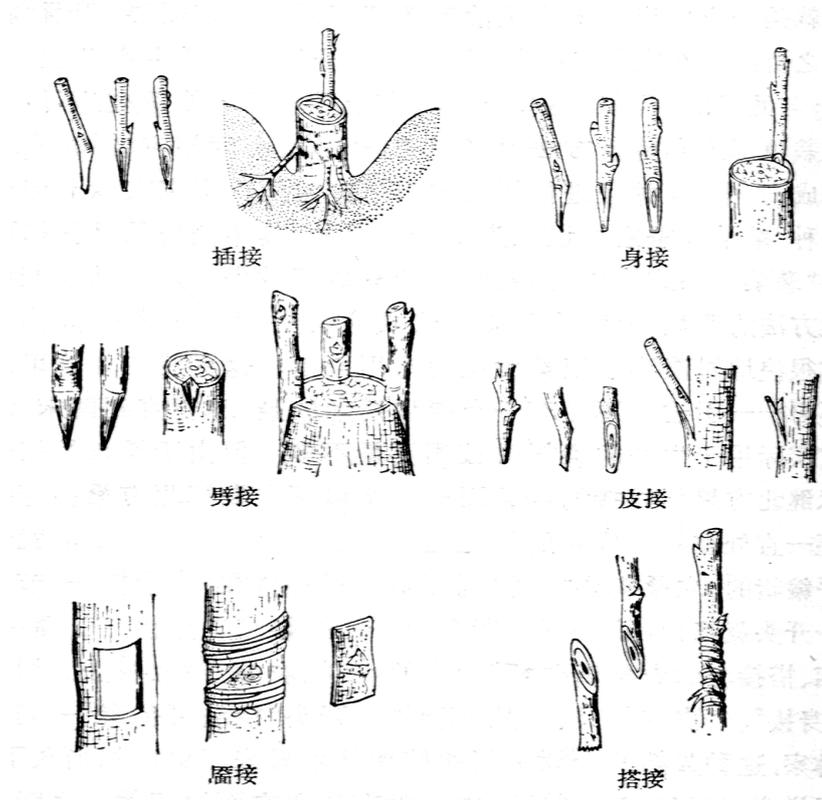


<sup>135</sup> From the website “上海印象”: <http://www.shimpress.com/>

<sup>136</sup> From the website “上海印象”: <http://www.shimpress.com/>

<sup>137</sup> 赵承泽 (2002),p 150。

<Figure<sup>138</sup>>



<Figure<sup>139</sup>>

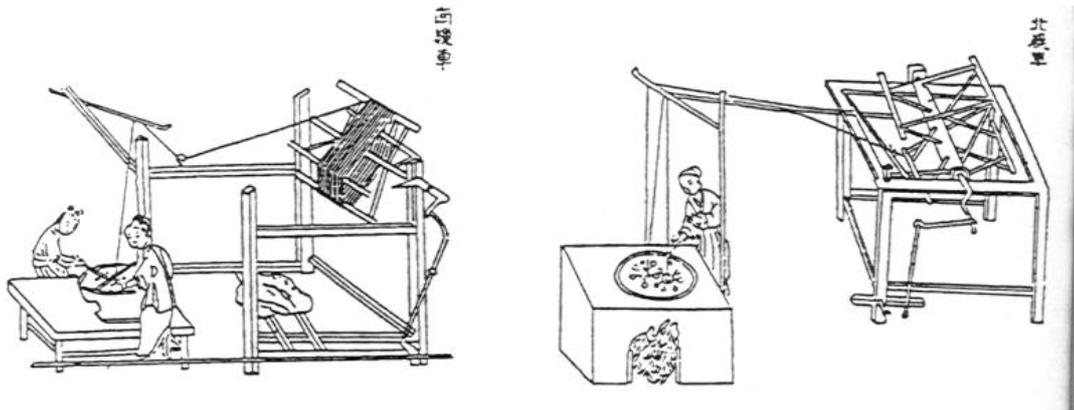


<Figure<sup>140</sup>: hand-moving 縲車>

<sup>138</sup> 张春辉等 (2004),p 150。

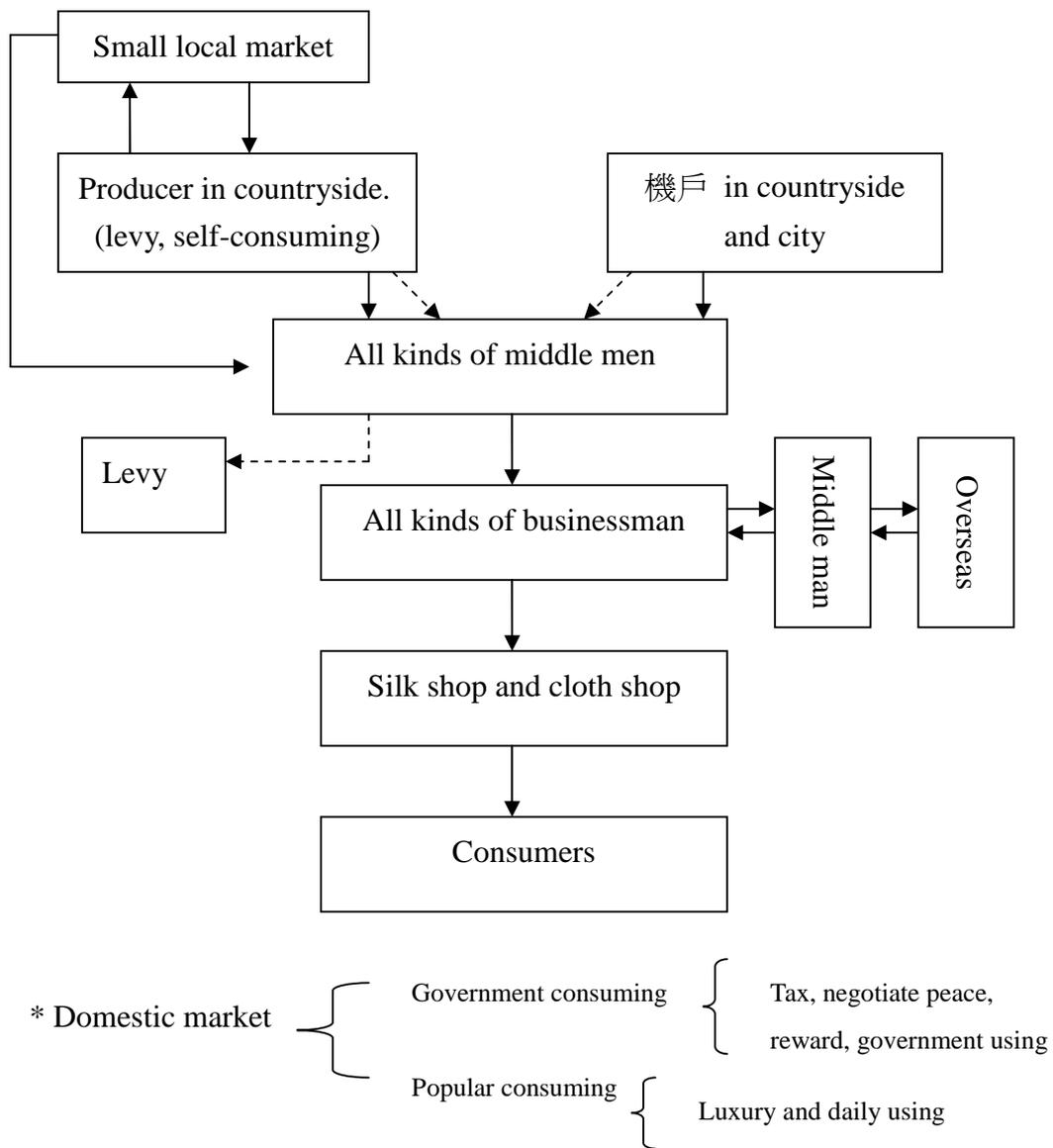
<sup>139</sup> 周匡明 (1983),p 206。

<sup>140</sup> 陈维稷 (1984), p 162。



<Figure<sup>141</sup>: Foot-moving 纜車 in South and North China. This figure is originally in 王禎 ”農書”.>

<sup>141</sup> 赵承泽 (2002),p 160。



\* Overseas (Liao, Jing, Japan, 大理, 高麗, 西夏, 西羌, 南海)

<Figure<sup>142</sup> >

<sup>142</sup> 斯波義信 (1968), p 291。

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