

THE SILK REELING INDUSTRY IN SHANGHAI

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the Shanghai Industrialization Study fin-
anced by the Institute of Pacific Relations*

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FOREWORD

The present report is one of a series of studies made or to be made under the Shanghai Industrialization Project. The data are mainly based on those collected during the survey of May—July, 1931, and supplemented, in the case of the silk industry, by a second survey during the same months of 1932 and certain investigations in November—December, 1930, and September, 1931, as well as the data collected and published by other organizations for 1928, 1929, 1930 and 1931.

Since the silk industry was only one of the numerous industries surveyed at the same time in 1931, the schedule used was the same for all industries, but additional information was collected with supplementary schedules and instructions. Also, while in the Preliminary General Report on Shanghai Industrialization published simultaneously with this report, certain items could not be summarized for all industries because of the lack of a common unit, such data are tabulated for the silk industry in the present report. These refer to the quantity of raw material used, the quantity of silk produced, the productive capacity of the filatures, the number of reels in the filatures, etc., etc.

In addition to the original data, certain figures are worked out from them and tabulated in this report to show the relations between these figures as well as the conditions in the industry. For instance, capitalization per reel, monthly productive capacity per reel, actual production per reel, number of reels operated by one horse-power and number of workers per reel (Tables XI, XX, XXII, XXVI, and XXX) are worked out from these data by dividing them with the number of reels in each filature. As the number of reels determines the size of the filature, which sometimes varies considerably, these per reel figures give more reliable averages.

Similarly, the percentage relation tables (Tables XII, XIII, XIV, XXIII, XLIV, and XLV) are each worked out from two sets of data and show what relation they bear to each other. The price tables (Tables XVIII, XXIV and XLIV) are based on quantity and value data of cocoons and silk. An interesting set of figures is found in Table

XLIII, where the quantity of silk as produced from one picul of dry cocoons is worked out from the quantities of raw material and output in each filature. This corresponds to what is known in the industry as *tsiao-che*, and serves to check up the popular conception of that figure.

As writing of this report began in 1932, immediately after the second survey was completed, 1931 was referred to in the report as "last year" and 1932 as "this year" or "the present time." These expressions have not been changed although the report was completed in 1933, after much addition to and revision of its contents. Chapter II on developments in the two years covered by our surveys had in particular to be left over and completed after the year 1932 was at an end. In addition to the statistical data collected by ourselves and other organizations, reference has been made in preparing the report to nearly all available publications in China on the silk industry, as far as circumstances permit.

Acknowledgment is especially due to Mr. B. T. Chang, who wrote Chapters II and XII of this report, and Mr. Chongchi Chen, who prepared all the statistical tables based on data collected by ourselves. Messrs. Chung-pi Chang, Teh-lin Wu, Y. Y. Young and a number of other men were responsible for collecting the original data in the two surveys. The last-named as well as Messrs. Chin-lin Wang and Chia-tung Wang helped work on the statistical data too. Miss S. T. King and Mr. H. Y. Lieu read the proof, and the former also helped edit the report. My thanks are due to them all.

D. K. LIEU.

Shanghai, July 18, 1933.

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CHAPTER I

HISTORY OF MODERN FILATURES IN CHINA

(i) *The Beginning*

Although Chinese silk was first exported in 1516, it was manufactured by old-fashioned handicraft method. In 1867, however, a Chinese merchant, Chen Chi-yuan (陳啓元), first established a modern silk filature at Namhoi, Kwangtung, after the French pattern as it was then used in Siam. By 1881 there were already ten modern filatures with 2,400 basins in that province. The development in the Yangtze Valley came much later. The first modern filature was opened here in 1880, when certain Italians imported modern reeling machinery to Shanghai, installed it near the Pentanglung Bridge (now the Shansi Road Bridge) and brought some experienced Italian women here to teach Chinese girls to operate the machinery. In the following year, a merchant, Hwang Tso-chin (黃佐卿), installed the first modern Chinese filature in this city on the north bank of the Soochow Creek. It was called Kunghoyung (公和永), and had only 100 basins. At the same time Jardine and Matheson (怡和) and Kungping (公平) established each a filature with 108 basins, and it took a year to construct the three plants so that they opened at the same time in the next year. They jointly engaged an Italian to be their engineer. Thus the earliest Shanghai filatures were patterned after the Italian mills.¹

In the first five years of their operation these three filatures lost heavily, and the Kungping Mill was reorganized into Chichang (旗昌). However, in 1887 the silk industry became more prosperous, and the Chinese mill Kunghoyung was enlarged by the addition of 800 basins. Three more Chinese filatures were established eight years later—Juilun (瑞綸) by Wu Shao-chin (吳少卿), Sinchang (信昌) by Ma Mei-shu (馬眉叔) and Lunghwa (綸華) by Yeh Chen-chung (葉澄衷).² The second has been reorganized more than once, but

¹This account is based on two articles by T. S. Miao and An Lee in the *Foreign Trade Guide*, Vol. I, No. 3 and Vol. II, No. 1.

²*The Industries of Shanghai and Foreign Trade Guide*, Vol. 1, No. 3.

is still in operation this year, and is the best and one of the largest filatures in Shanghai. The first had 600 basins and was in operation as late as last year, but this year* the plant is dismantled and the site is used for the building of dwelling houses and business premises. The same fate fell to Lunhwa a couple of years ago, and it must have suspended operation or reorganized for a longer period, since there is no mention of this filature in any of the records as far back as 1928. Being located in sections which have now become flourishing business centers, the Juilun and Lunhwa mills are more valuable as business sites than as industrial plants, especially when the silk industry is at a low ebb. On the other hand, Sinchang is situated a little farther out, which explains in part the possibility of preserving it as a silk filature.

According to Messrs. Miao and Lee, the history of China's silk industry may be divided into three periods: (1) 1909-1916 when our silk industry first suffered a defeat from competition with Japan, (2) 1917-1926 when reforms were introduced through foreign influence, notably French and American, and (3) 1927-date when reforms have been introduced by our own initiative. A brief account of the developments in these three periods will be abstracted from their interesting article.³

(ii) *The Three Periods*

Previous to 1909, or the First Year of the Manchu Baby Emperor, Hsuantung, the quantity of Chinese silk exported had been larger than that of Japan, although sometimes, in 1907 for instance, the two were almost the same. It was only in 1909, however, that Japan's silk export began to exceed that of China, and this advantage the former has been able to keep up ever since. In fact, in recent years, the Japanese export was nearly three times that of this country. From the point of view of our own foreign trade, silk also decreased in significance since 1909. Before that date it used to constitute from 20 to 30 per cent of our total exports, but the average for the years 1909-1916 fell to 17 percent.

³T. S. Miao and An Lee, "Twenty Years of Chinese Silk", the *Foreign Trade Guide*, Vol. II, No. 1.

*1932.

The most important market for Chinese silk had been France. During the European War French purchasing power for silk dropped to nil, and Chinese silk export suffered greatly from it, although our total export increased during that period. Meanwhile, Japan developed the American market, which was least affected by the war, and her silk export grew by leaps and bounds. In spite of that, however, the number of silk filatures increased from 35 in 1909 to 61 in 1916, and the number of reels from 11,085 to 16,692. The authors did not give any explanation for this increase, but it is our surmise that it was due to increased demand for steam filature silk in preference to the hand-reeled product.

In 1917, on the joint initiative of the French Chamber of Commerce in Shanghai and the Kiangsu-Chekiang-Anhwei Silk and Cocoon Association, a meeting was held of representatives from these organizations as well as of the British, American and Japanese Chambers of Commerce and other foreign silk interests in Shanghai. A permanent body, known as the International Committee for the Improvement of Sericulture, was established. The Chinese Ministry of Finance contributed from the customs revenue a monthly sum of 4,000 Haikwan taels, which has since 1923 been increased to 8,000 taels (approximately \$11,200 silver), to the support of the Commission. Similar international bodies were organized in Canton and Chefoo, while the Nanking University and the Canton Christian College also maintained special sericultural departments. In February, 1924, the Shanghai International Testing House opened for business through the joint efforts of Chinese and American silk interests.

Two important features of this period are the marked increase in the export of steam filature silk relative to other kinds of silk, and the establishment of Chinese silk export companies and export departments in some filatures like Hwatung (華通), Weicheng (緯成) and Hulin (虎林). However, in these ten years, the number of Shanghai filatures grew very slowly from 70 to 81 and the number of basins from 18,386 to 18,664. More rapid growth was however witnessed in Wusih and other localities in Kiangsu and Chekiang, as may be seen from the following figures.

Although some sericultural reform was also introduced by Chinese institutions alone during the last two periods, such reform was most

TABLE I
FILATURES IN KIANGSU AND CHEKIANG

Locality	1917		1926	
	Filatures	Reels	Filatures	Reels
Shanghai	70	18,386	81	18,664
Wusih	8	2,532	20	6,621
Other places in Kiangsu & Chekiang	8	1,836	16	3,412

significant in the third period, since the National Government was established in Nanking. One of the most important reforms was the abolition of the limitation on the opening of cocoon houses in Kiangsu so that any person may open one in any part of the province, provided the total capacity of all such houses in the district did not exceed the total production of cocoons. A most up-to-date sericultural experiment station with a mulberry farm of 130 *mow* and a budget of \$360,000 was established by the government in Wusih (無錫). In Hangchow (杭州), Chekiang, a government sericultural institution installed a model silk filature of the latest Japanese type, as this type is now found to be superior to the Italian kind. Cooperative production and marketing of silkworm eggs and silk were introduced in many districts in Chekiang, notably Hsiaoshan (蕭山), where there is now a cooperative silk filature. For cooperation between silk exporters, an association of raw silk exporters was formed in Shanghai.

It is a pity that the same authors did not publish any statistical data of Shanghai filatures for the third period, although the total number of filatures in the whole country is given in the *Export Inspection Bulletin*, Vol. I, No. 2, published by the same office. However, from various sources, we are able to collect the necessary data to complete the Statistical Table of Shanghai Filatures (Table II) down to 1932. It will be seen from this table that the industry kept on growing until the latter part of 1930, when the sudden drop in silk prices abroad caused a large number of existing filatures to close down. In the two following years covered by our own surveys, the industry revived to a certain extent at the beginning of the season when new cocoons were available, but lapsed again towards the end of the calendar year.

TABLE II
STATISTICS OF SHANGHAI FILATURES

Year	Filatures	Reels	
1909	35	11,085	
1910	46	13,298	
1911	48	13,738	
1912	48	12,392	
1913	49	13,392	
1914	56	14,424	
1915	56	14,424	
1916	61	16,692	
1917	70	18,386	
1918	68	18,800	
1919	65	18,306	
1920	63	18,146	
1921	58	15,770	
1922	65	17,260	
1923	74	18,546	
1924	72	17,554	
1925	75	18,298	
1926	81	18,664	(1)
1927	93	22,168	(2)
1928	104	23,911	(3)
1929 (May)	104	24,423	(4)
1929 (August)	107	24,906	(5)
1930 (April)	107	25,395	(6)
1930 (September)	32	6,791	(7)
1931 (May-July)	70 (66)	18,326 (17,238)	(8)
1931 (September)	30	7,097	(9)
1932 (May-July)	46 (45)	12,262 (12,046)	(8)

(1) All data down to 1926 are taken from an article by T. S. Miao, Chief of the Silk Department, Bureau of Inspection and Testing of Commercial in the *Foreign Trade Guide*, Vol. II, No. 1.

(2) From *China Industrial Handbook*.

(3) From Association of Silk Filatures.

(4) From "The Industries of Shanghai", published by the Bureau of Social Affairs, Municipality of Greater Shanghai.

(5) From "Wages and Hours of Labor", compiled by T. Y. Tsha and published by the same Bureau.

(6) From an article by T. S. Miao in *Foreign Trade Guide*, Vol. I, No. 3.

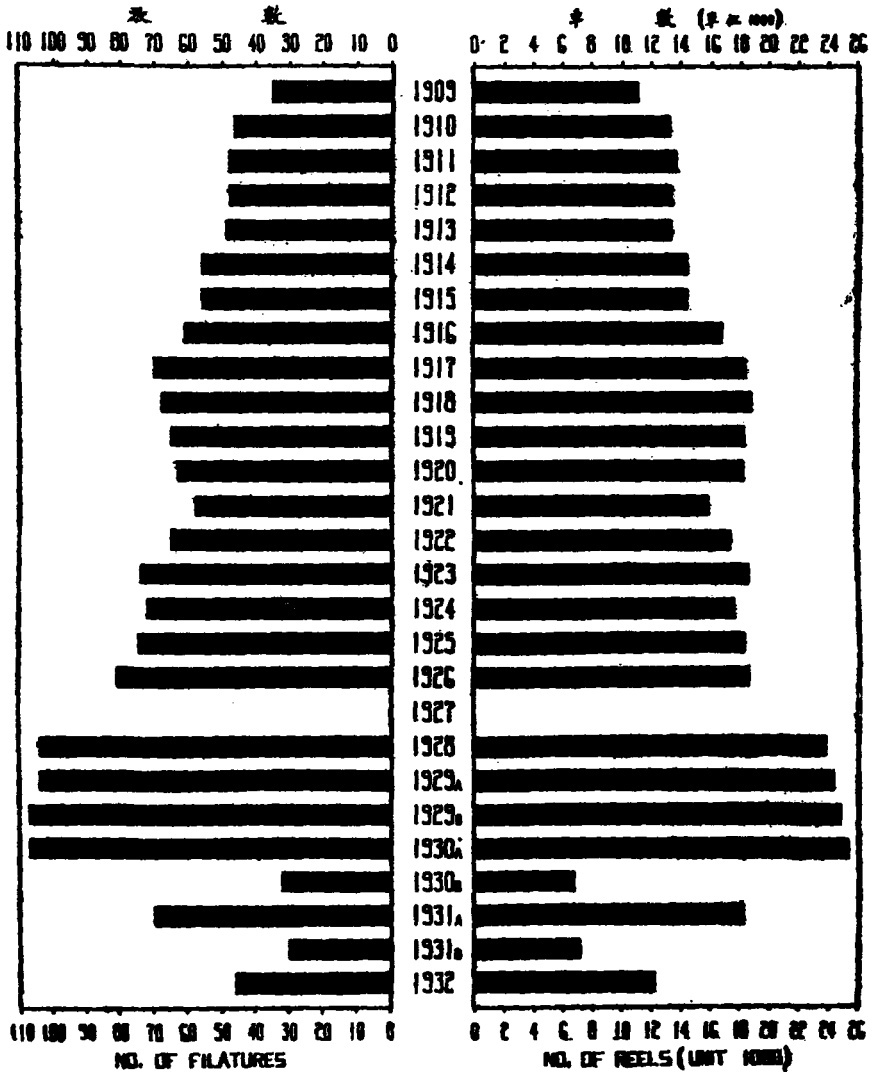
(7) From an investigation report in the same magazine, Vol. I, No. 8. The number of reels in two of the 32 filatures is not known, but we know that one of these two is a duplication.

(8) From our own surveys in these two years. Figures in brackets exclude duplion filatures.

(9) From the reports of factory inspectors of the Bureau of Social Affairs. The statistics are not complete because the filatures in the foreign settlements were not inspected, and even for those that were in Chinese territory and inspected, the number of reels in five filatures is not known.

FIG. 1. NUMBER OF FILATURES AND REELS IN SHANGHAI

上海歷年絲廠數及各廠絲車總數圖



(iii) *The Slump in 1930*

As the last three years are of special importance to us, 1930 as the last date of normal growth and the turning point, and 1931 and 1932 as the years covered by our surveys, we will give a more detailed account of these dates.

As may be seen from Table II on Statistics of Shanghai Filatures, the number of both filatures and reeling basins reached their maxima in April, 1930. But that was at the end of the 1929-1930 season when the silk industry of Shanghai reached its zenith. Since then many factors appeared which caused the downward turn until in November of the same year, 106 of the 107 filatures closed down on account of the trade depression, as reported in the *North China Daily News*. The industry, however, soon revived, and 35 or about a third of them reopened. The factors which caused this great slump were on the one hand the curtailed demand in the silk-consuming countries, and the over-production of raw silk in Japan, both of which affected the price of the finished product, and on the other, the poor spring crop of cocoons in Kiangsu and Chekiang, which brought up the cost of the raw material. As the last factor took effect first, we shall first give an account of the cocoon situation.

It is roughly estimated that, in order to supply all the filatures in Kiangsu and Chekiang with a sufficient quantity of cocoons for the whole year, 500,000 piculs of dry cocoons must be produced in these two provinces. So far the spring crop is the most important one, but in 1930 the crop was poor and Kiangsu produced only 110,000 piculs and Chekiang 250,000 piculs of dry cocoons. This means a shortage of 140,000 piculs. Although the summer crop followed two months later, as usual it added very little to the supply, being only a few thousand piculs for the two provinces. The autumn crop, on which much effort had been spent during the last few years, and which increased 100 per cent during the current year, yielded only 31,000 piculs. For lack of sufficient supply, the fresh spring cocoons were sold at from 50 to 65 dollars silver, which meant that the cost of raw materials per bale of raw silk amounted to 900 taels. Adding to that the manufacturing expenses of about 250 taels, the total cost of production was therefore at the beginning of the season 1,150 taels

per bale.⁴ This was a sufficient deterrent for many filatures to start operation in 1930.

Now about the price of silk which was affected by the two other factors. At the beginning of the calendar year, the Extra B grade of steam filature silk was sold at 1,110 taels. It rose to 1,160 in February and March, began to drop in April and reached the low level of 960 in May. Then it went up again in the latter part of May and reached a peak in June. From June to August it remained quite steady at 1,110, and even went up to 1,130, but the final slump came in September. Toward the end of that month the price was 990 and by December it reached the very low level of 850 taels. The course of the price of the Two Golden Stag Brand given in Table VII⁵ during the year shows similar fluctuations, in the same months.

The effect of this fall in price was that, in September, 1930, only 32 of the 107 Shanghai filatures and 6,791 of the 25,000 odd reels were in operation. It was less than one-third of the total. Were it not for the low silver value, the slump would have taken place much sooner, as in Japan the average price per bale of raw silk dropped from 1,140 yen to 800 yen in less than a week in June. At the same time, the spot price of best grade raw silk in Yokohama dropped from 1,190 yen in January, 1930, to 540 yen in October, the lowest point in the year. China apparently was affected only after the price abroad steadily declined.

The most important market for raw silk is America, which consumes approximately 70 per cent of the world production of silk. In 1929 her consumption was 620,000 piculs, when converted into Chinese weight units, but in 1930, when according to the trend of consumption in the past it should have grown to 650,000, it dropped to 580,000 piculs.⁶ It means a difference of 70,000 piculs, or nearly 70 per cent of the total production of the Chinese filatures. Fortunately for China,

⁴The information in this and the two following paragraphs concerning cocoon production and silk prices are largely taken from *Export Inspection Bulletin*, Vol. II, No. 2, pp. 1-3.

⁵The data in that table are from the National Tariff Commission. Department of Price Index Numbers.

⁶An Lee, "The Silk Panic in Japan", *Foreign Trade Guide*, Vol. II No. 8. As the information is apparently from Japanese sources, the figures about American consumption may not be accurate, although we have no better source of information to check them.

however, the effect was not as great as it might be, as may be seen both from the annual export figures of 1928-1930 and the monthly figures for the last year. There was of course a decrease of 34,000 piculs of all kinds of silk exported in 1930 as compared with 1929, and about 30,000 as compared with 1928, but the percentage decrease was only about 20. Similarly, although the monthly export figures decreased suddenly since September of that year, there was a revival in December. Hence the curtailed demand of the United States was perhaps more keenly felt in Japan which produced some 60 per cent of all silk, and which had the same gold standard as in America, than in China with her 30 per cent production and her silver standard.

TABLE III
EXPORTATION OF SILK⁷

	1928	1929	1930
White raw silk, all kinds	118,183	124,120	98,603
Yellow raw silk, all kinds	29,484	26,395	22,061
Wild raw silk, filature and non-filature...	28,372	29,519	26,198
Total	176,039	180,034	146,862

The Chinese Customs Report also gives a concise account of the silk industry and trade in 1930. It is quoted in brief below:—

“The prospect of better trading conditions and the tendency towards a rise in price with which the year 1929 closed were not destined to be fulfilled, and the period under review as a whole must be considered to have been an exceptionally bad one for both producers and exporters alike. . . . It was only the fall in the value of silver which made trading possible and maintained tael prices at a comparatively steady level despite the slump in gold prices on the New York and other markets. In the silk-growing districts of Kiangsu and Chekiang climatic causes had a disastrous effect on the spring crop of cocoons, and it was necessary to import a considerable quantity of cocoons from Japan in order to keep filatures in operation. . . . In the Shanghai and adjacent areas the year was characterized by frequent strikes in many filatures, some being of long duration, but in most cases these strikes have proved a blessing in disguise rather than a hindrance to the trade, and have prevented large unsold stocks accumulating and further depressing the market. . . . An item of more than passing interest, however, is that the local consumption

⁷*Foreign Trade of China, 1930, Part I, p. 56.* All quantities are in piculs.

of raw silk by Chinese appears to have increased considerably during the past year, and many middle grades spun by raw silk filatures which were refused by exporters were thus absorbed with direct benefit to the trade.”⁸

With regard to foreign trade and prices, the Report has also this to say about silk:—

“As regards distribution of trade America accounted for approximately the same quantities of steam-filatured raw white and yellow silk as in the preceding year. Exports to France again declined heavily, the Lyons market being unable to adjust prices to meet producers’ demands. . . . The following comparative summary for Extra B 13/22 steam filatures shows the general trend of prices on the Shanghai, New York and Lyons markets, the figures in francs and gold dollars being the gold equivalents per kilo and per pound respectively at current rates of exchanges:—

	Sh. Taels	Francs	Gold \$
January	1,100	279	4.48
August	1,100	196	3.20
December	900	156	2.56

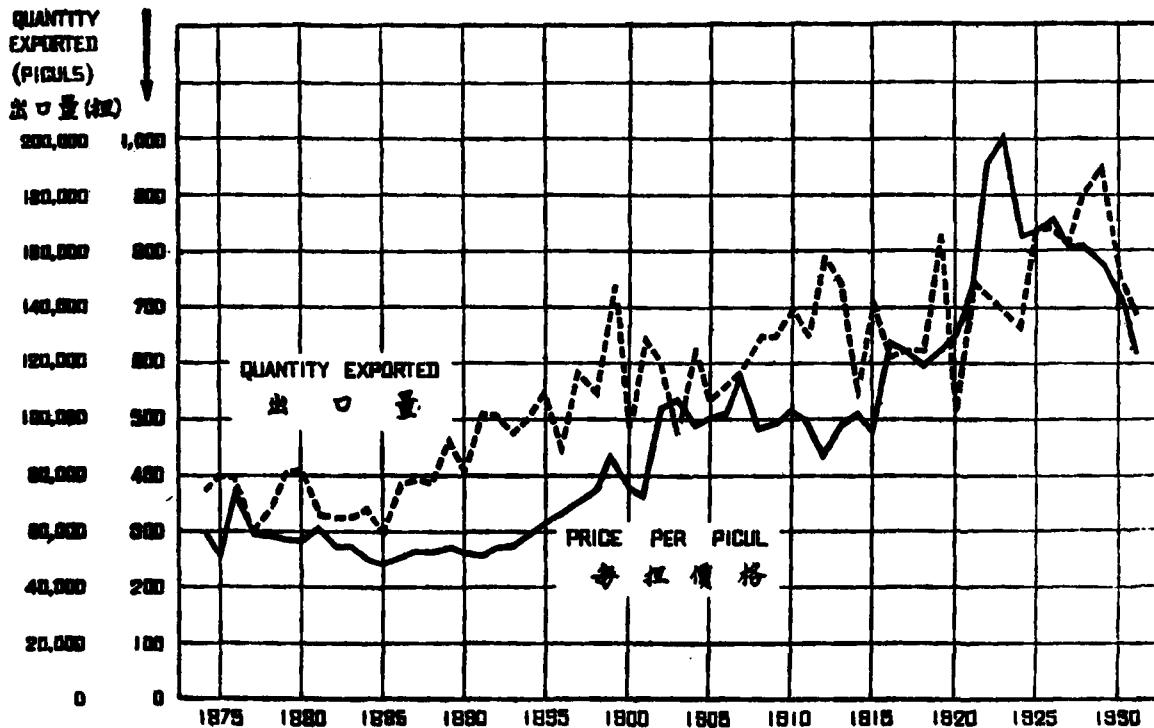
⁸*Foreign Trade of China, 1930, Part I, pp. 55-56.*

FIG. 2. SILK PRICE AND QUANTITY EXPORTED

PRICE PER PICUL
(HAIKWAN TAEIS)
每担價格(關兩)

1874—1931

歷年生絲出口量及每担平均價格圖



CHAPTER II

DEVELOPMENTS IN THE TWO YEARS COVERED BY OUR SURVEYS

(i) *The First Part of 1931*

The effect of the slump was more keenly felt in 1931 than the preceding year. Although the year 1931 opened with brighter prospects and demand for raw silk on the Shanghai market improved substantially because of the advantages offered by low silver values, yet the revival was a short-lived one. The price for Shanghai white filatures rose by nearly Tls. 200 per bale in January and the early part of February, but towards the end of the latter month, a sensational drop was recorded, this being caused by the disposal of accumulated stock on foreign markets by Japanese merchants at very low prices. Shanghai silk filatures could not part with a bale of raw silk at the quotations then ruling without losing Tls. 200 to Tls. 300. Notwithstanding the low prices for raw silk, the cost of production was unusually high because the cocoon crop of the preceding year in Chekiang and Kiangsu was exceedingly poor in quality, both the *hung che* and *tsiao che*⁹ being high. As the filatures tried to re-open after the Chinese New Year holidays,¹⁰ demand for dried cocoons was fairly brisk but the supply was very limited; so the drop in the price of raw silk did not bring about a corresponding fall in the price of dried cocoons. Under such circumstances many of the filatures could not purchase the necessary raw materials without outside financial assistance.¹¹

Now it must be borne in mind that most of the filatures operate with a limited amount of capital. As a rule, the management does not own the plant but leases it from an estate agent or a private

⁹*Hung che* (橫折) and *tsiao che* (繭折) are terms used by silk filatures to indicate the quality of the cocoon. *Hung che* refers to the loss of weight after drying and *tsiao che* to the percentage of raw silk produced.

¹⁰One report says that nearly 80% of the filatures in Kiangsu and Chekiang re-opened after the Chinese New Year holidays.

¹¹This paragraph is based on information contained in the *Bankers' Weekly*, Vol. 15, Nos. 2, 3, 4, etc.

person for a year.¹² When the market for raw silk was good, the filatures could considerably inflate their capital by loans from banks, especially native banks, but during a slump like that under review, difficulties were naturally experienced by the filatures in their endeavour to obtain credit facilities. Besides, owing to dullness of the market and their reluctance to part with their stock at a sacrifice, the filatures were already heavily indebted to the banks. According to a report issued by the Investigation Department of the Shanghai Commercial and Savings Bank, at the close of 1930, the indebtedness of the filatures to banks amounted in total to over \$30,000,000.¹³ This naturally called for financial aid from the Government. As early as February 5 the Shanghai Silk Filature Owners' Association appointed a delegation to call on the Vice-Minister of Finance and repeat their request for the issue of the proposed silk loan of \$8,000,000, for which a set of regulations was promulgated in May. The regulations provided that one half of the loan proceeds was to be applied for encouragement of the export trade of raw silk and the relief of the silk industry.

In the first two or three months of the year the filatures in Shanghai, with the assurance of a light tax on silk goods and a promise of financial assistance from the Government, were still optimistic despite unfavourable market conditions. A serious question then confronting them was how to obtain credit facilities, of which many were sorely in need. Arrangements were accordingly made with the banks for the loan of the dried cocoons in the latter's godowns. With such facilities about 40 per cent of the filatures in Shanghai could carry on notwithstanding the depressed market for raw silk. April was a very poor month. Despite the approach of the new crop season, there was no forward trading on the Shanghai market. The American market was still depressed and Japan prices were sagging. In the latter part of the month prices continued to fall and bad news were received from abroad. The demand for spring silk fabrics on European and American markets was dull and rayon was much used by foreign silk mills for summer fabrics. On the other hand, Chinese

¹²*Chinese Economic Journal*, July, 1928, p. 591. There are, however, a few large and well-financed filatures which own the plants themselves.

¹³Report on Trade and Money Market in 1930, issued by the Investigation Department of the Shanghai Commercial and Savings Bank, published in the *Bankers' Weekly*, Vol. 15, No. 7.

silk merchants refused to sell at current quotations because in so doing they would lose over Tls. 200 a bale. Besides, they were not well-stocked and the depleted stock of dried cocoons made them all the more reluctant to part with their raw silk stocks before the appearance of the new cocoon crop on the market. In the first two weeks of May, prices continued to fall and Chinese merchants refused to sell because the prospects of the new cocoon crop in Chekiang and Kiangsu were exceedingly poor owing to unfavorable weather conditions. At normal times, when the new cocoon crop appears on the market in the latter part of May, future sales are usually very brisk. But that year very few such sales were recorded, the cocoon crop being very poor and the filatures anticipating a shortage of raw materials.¹⁴ Reviewing the poor cocoon crop of that year, the *Chinese Economic Bulletin* had the following to say:—

“In anticipation of a shortage of cocoon supply at home and bad business prospects abroad, many of the silk merchants in Shanghai hesitate to operate their filatures this year. There are 106 silk filature plants in Shanghai, which are leased to silk merchants by yearly contract. In a normal year by June 1, when the new crop is just appearing on the market,¹⁵ between 80 and 90 per cent of the establishments have been leased out, but this year it is reported that 40 are ready to start operations.”¹⁶

In other cities in Kiangsu and Chekiang the situation was equally grave. Since August, 1930, filatures in these two provinces closed down one by one owing to lack of circulating capital; the filatures refused to sell their product at ruinous prices. While stocks were accumulating, the filatures' indebtedness to the banks was increasing and the prices of raw silk were dropping by leaps and bounds. In the middle of June only 30 odd filatures in Wusih were operating out of a total of 49,¹⁷ and large numbers of filature operatives were thrown out of employment. In May the market remained as dull as ever. Export to the United States was very limited. In weight

¹⁴The information contained in this paragraph is taken from the *Bankers' Weekly*.

¹⁵According to our own investigation, it is often earlier, and begins to appear in May.

¹⁶*Chinese Economic Bulletin*. Vol. XVIII, No. 24, p. 302.

¹⁷This figure is taken from the *Native Bankers' Monthly* and may not be accurate. As the filatures were operating off and on, it is rather difficult to find out the exact number of those opening at a particular time of the year.

the May, 1931, shipments to U.S.A. (105,021 lbs. valued at G.\$193,386) were but little more than 25% of the shipments of May, 1930 (376,082 lbs. valued at G.\$1,350,964) and the value was approximately only 14% of that of the preceding year. In June the conditions were worse. The export figure for U.S.A. fell far below that of the preceding month. There were only 32,320 lbs. valued at G.\$58,405 as compared with 615,721 lbs. in June, 1930, valued at G.\$1,688,320. In July the market revived a little but sales were still small. The shipments to U.S.A. amounted to 64,992 lbs. valued at G.\$143,846, which represented less than one tenth of the value of export during the corresponding month of 1930, when 565,919 lbs. valued at G.\$1,629,116 went forward to America. Unsatisfactory as the figure was, it nevertheless served to encourage the trade to a certain extent, because the July export was double in quantity and nearly three times the value of the June export. The filatures were not, however, eager to sell, because (1) they were not over-stocked, (2) the cost of production was high and (3) the new cocoon crop was poor.¹⁸

(ii) *The Latter Part of the Year*

The position of the filatures became more and more unenviable in the latter part of the year. The market prices for raw silk were always Tls. 200—Tls. 300 below the cost of production. In the early part of the year, the filatures could easily raise a loan of Tls. 800 on every bale of raw silk, which was more than the purchase prices offered by exporters. So instead of selling their product, the filatures used their stock as security to raise loans. But in the latter part of the year, when the local money market was tight, the filatures could not obtain credit facilities from the banks as readily as before. The eagerly awaited silk loan¹⁹ was issued at the beginning of September and nearly all the filatures in Kiangsu and Chekiang, which were prepared to re-open, obtained a share of the loan as subsidy. With the aid of the loan proceeds, quite a number of fila-

¹⁸The information concerning the market conditions in this paragraph is gathered from reports in the *Bankers' Weekly*.

¹⁹The authorized amount of the loan was \$8,000,000, of which \$6,000,000 were issued. To create a sinking fund for redemption of the loan, a customs surtax of \$30 was levied on each picul of raw silk exported. The Government made it a condition that filatures benefited by the loan should not suspend operations without good reasons, and filatures applying for a share of the loan were first required to make a written promise to this effect.

tures managed to re-open, though the outlook of the trade was still very gloomy. Prices of dried cocoons were high; there was a shortage of supply of dried cocoons of the spring and summer crops, while the autumn crop which, as the filatures had expected, would make up the shortage, was again ruined by wet weather. The buying of dried cocoons was brisk as the filatures were fully aware of the shortage. At the same time the market for raw silk showed little improvement and sales were small. Under such circumstances, many of the filatures found it impossible to carry on notwithstanding the aid of the silk loan, which proved totally inadequate to cover even a part of the filatures' losses. It is said that by operating one day a filature would lose on the average about Tls. 200. The situation was further aggravated by the anti-Japanese boycott following the September 18 incident in Manchuria. Previous to that time the filatures used to dispose of a part of their by-products (waste silk, cocoon strippings, etc.) to Japanese merchants and the proceeds from such sales could help reduce the cost of production. But after the boycott the Japan market for their by-products was closed and the losses of the filatures became heavier. Some of the filatures which had re-opened after the issue of the silk loan began to close down.²⁰

While the foreign markets were practically at a standstill, demand for raw silk on the domestic market was also very unsatisfactory. In the spring when the American market was depressed and Japan prices were sagging, the local silk mills, being stimulated into great activity by the availability of larger quantities of raw silk at attractive prices, absorbed a good portion of the output of the filatures. The silk mills, being able to turn out fabrics at low prices, encouraged consumption at home and also in countries to the South, such as the Malay States, Singapore, Siam and India. But in the latter part of the year, the purchasing power of the masses at home was greatly impaired by the widespread floods in the summer, which affected 16 provinces. With conditions unsettled in Manchuria after the September 18 incident, the market of the Three Eastern Provinces was almost closed, though formerly Manchuria was a great consumer of silk fabrics from China proper. Another factor which adversely affected the consumption of raw silk at home is the competition of

²⁰The information in this paragraph is gathered from the weekly reports on the silk market in the *Bankers' Weekly*.

rayon, which has not only ousted the natural product from the silk mills abroad but is also pushing it out of the domestic market. In recent years Chinese silk mills prefer rayon to natural silk, because the former is cheaper and capable of producing low-priced fabrics, especially when used in combination with cotton yarn. The following figures of yearly consumption of natural and artificial silk by Chinese mills shows the gradual decrease in the quantity of natural silk, with an almost corresponding increase in the amount of artificial silk:—²¹

	<i>Natural Silk</i> (Piculs)	<i>Artificial Silk</i> (Piculs)
1927	3,000,000	Nil.
1928	2,500,000	895,000
1930	790,000	759,000
1931	720,000	954,000

(iii) *The High Cost of Cocoons*

In a preceding paragraph we already mentioned the high cost of production due to shortage of cocoon supply. In the latter part of 1931 the shortage of raw material was more keenly felt than before owing to the failure of the spring crop. High-priced cocoons made the filatures unable to cut down the cost of production, which was always from Tls. 200 to Tls. 300 above market prices. For instance, in November Chinese silk, B. Grade, 20/22 denier, 80 evenness, was quoted on the New York market at an equivalent of Tls. 900 per bale and about Tls. 800 on the Shanghai market, while the cost for cocoons alone was Tls. 800—Tls. 900 for the spring and summer crops and Tls. 900—Tls. 1,000 for the autumn crop. To this must be added a sum of Tls. 150—Tls. 200 for labor and other incidentals. Under such circumstances it was impossible to compete with Japanese silk, which was sold at 15 to 20 per cent cheaper. The high price of cocoons was chiefly due to the failure of crops, though there were other factors. Freight, tax and heavy overhead expenses of the cocoon

²¹These figures are taken from an article entitled: *The Silk Slump: Its Cause and Cure*, in the *Chinese Economic Bulletin*, Vol. XX No. 25. We do not vouchsafe for the accuracy of these figures, which may refer to the silk mills in Shanghai only. Artificial silk, as we understand, was first introduced into the Hangchow mills as early as 1924.

collection agencies in the interior all enter into the cost²² While the filatures complained of the high cost of raw material, the farmers were not yet satisfied with the prices offered by cocoon merchants even in 1930 and 1931, when prices for fresh cocoons were twice as high as those in 1932. During the past few years farmers found sericulture no longer as profitable as other agricultural pursuits. Investigations made at Wusih and Kiangying, two chief sericultural centers of Kiangsu, show that there has been a rapid decrease in the acreage of mulberry plantations during the past few years. In Wusih the acreage has decreased from 251,000 *mow* in 1930 to 84,000 *mow* in 1932 and in Kiangying from 124,000 *mow* to 54,000 *mow* during the same period.²³ Unless efforts are made to cut down the cost of production, the outlook of the silk industry seems exceedingly gloomy.

To reduce the cost of production it has been found necessary to improve the stock of silkworms. Hitherto, the silkworm egg cards were prepared by a class of professional breeders by haphazard methods. To them microscopic examination and other scientific treatment of the egg cards are unknown. Worms so bred are naturally of a very inferior variety, yielding cocoons of poor quality and easily succumbing to unfavorable weather conditions. In Japan a picul of raw silk can be produced from 280 to 300 catties of dried cocoons, while in China it required 450 to 700 catties to produce the same quantity of raw silk. This marked difference in *tsiao che* (percentage of silk yielded by cocoons) is partly due to ill-sorting and partly to the poor quality of Chinese cocoons, and in order to improve the stock of silkworms, various measures have been adopted by the Government. In addition to the reforms referred to in an earlier chapter of this pamphlet, marked progress has been made in the preparation of egg cards during the past few years. In Chekiang, for instance, the number of egg cards prepared by scientific methods is increasing by leaps and bounds. In 1928 the number of such egg cards prepared and issued by the sericultural institutions totalled 10,580 pieces for both the spring and the autumn crops, in 1929 120,000 pieces, in 1930 230,000 pieces, and in 1931 approximately 600,000 pieces. In Kiangsu a still greater advancement has been made in

²²"Cocoon Crops in Chekiang and Kiangsu" by B. T. Chang, *Chinese Economic Journal*, Vol. V, No. 1.

²³A report published in the *Sin Wen Pao*, June 4, 1932.

this direction. In 1930 the number of scientifically prepared egg cards totalled 2,364,093 pieces and in 1931, 2,373,848 pieces. The silkworm hatcheries established by private persons are subject to official supervision and restriction. Any one preparing silkworm egg cards for sale must first apply for official recognition. In 1931, 140 officially recognized hatcheries were operating in Kiangsu, 56 in Chekiang and 12 in the special Municipalities of Shanghai and Nanking. Imported silkworm egg cards are subject to a rigid examination by the Bureau of Inspection and Testing of Commercial Commodities. Offices have been established in the various silk producing centers of Chekiang and Kiangsu to teach the farmers up-to-date methods of silkworm rearing. The number of such offices is increasing year by year. In Chekiang, for instance, 20 such offices were operating in the spring season of 1929 and 40 in the autumn season of the same year and in 1930 the number increased to 50. In Kiangsu similar progress has been recorded in this connection.²⁴

(iv) The Number of Filatures Operated

The number of silk filatures operating during 1931 varied from month to month. Some of them worked off and on at different periods of the year. In a previous paragraph we mentioned that in November, 1930, only one out of the 107 filatures in Shanghai was operating. It seems that in December, 1930, about one third of the filatures re-opened with a reduction of about 15% in wage scale. The year 1931 opened with high hopes. One report says that after the Chinese New Year holidays, about 80% of the filatures in Chekiang and Kiangsu were operating normally. In May many filatures in Shanghai closed down owing to poor business prospects and in the following month notwithstanding the appearance of the new cocoon crop on the market, only 70 filatures were operating.²⁵ At the beginning of August 36 were open, though on the average each filature lost about Tls. 200 a day. Production was then curtailed owing to heavy losses and the underselling of Japanese stocks on foreign markets. The loan for relief of the silk trade was issued chiefly to keep the filatures open, as it was feared in Government circles that as there

²⁴The figures in this paragraph are taken from two articles by Messrs. Chow Yen-ting and An Lee, published in the *Foreign Trade Guide*, Vol. II, No. 5 and Vol. III, No. 1 respectively.

²⁵Our own investigation, including 4 dupion filatures.

were already a large number of filature operatives out of employment, the closing of more filatures would aggravate the situation. At the beginning of September, after the issue of the loan, more than 20 re-opened, making a total of about 60 in Shanghai. The depression on the market continued and the loan proved of little help owing to heavy losses. In October the filatures began to close down. In the middle of the month about 70 filatures in both Shanghai and Wusih remained open and about 10 in Chekiang province. Later in the month more filatures suspended. In Shanghai the number was about 40, of which about 8 or 9 were operating off and on. By the end of the month only 26 ordinary filatures and 3 dupion filatures were operating.²⁶ This led the Ministry of Industries to issue instructions to the filatures reminding them of the pledge they made to the Government to keep their establishments open after obtaining a share of the silk loan and advising them not to close down unless they were compelled by unavoidable circumstances. In compliance with the instructions, about 14 managed to reopen. In Wusih 18 out of a total of 49 were operating while most of the 25 filatures in Chekiang were reported to have closed down. In the latter part of November more and more filatures suspended operations. At one time it was reported that only 15 out of a total of 107 filatures in Shanghai, 14 out of a total of 49 in Wusih and less than 10 out of a total of 30 in other parts of Kiangsu and Chekiang remained open. Towards the end of the year the position of the filatures became worse. Prices for raw silk continued to fall and the filatures could no longer raise loans from the banks on their stocks, which were rapidly deteriorating in condition and depreciating in value. By that time nearly 90% of the filatures in other cities in Kiangsu and Chekiang suspended operations and about 20 with a total of 4,578 reels remained open in Shanghai. Of these, eight were in Chapei, five in the Hongkew district, four in the International Settlement and three in Nantou.²⁷

(v) *The Year 1932*

Bad as the conditions were in 1931, the history of the filatures for 1932 makes still less cheerful reading. The year opened with

²⁶*Chinese Economic Bulletin* Vol. XVIII, No. 24, p. 302.

²⁷Unless otherwise mentioned, the information in this paragraph is gathered from reports on the silk trade in different issues of *the Bankers' Weekly*, Vol. 15.

quotations on the New York market for medium grade Chinese raw silk at G.\$1.70 a pound, equivalent to about Tls. 720 per bale, while the cost of production was Tls. 850—Tls. 950 for cocoons plus Tls. 200 for labor and incidentals. Under such circumstances the filatures naturally refused to sell. Stocks were accumulating. In January the number of filatures remaining open in Shanghai dwindled to ten: four in Nantou, two in the Hongkew district, one in the International Settlement and three in Chapei. Meantime, the Shanghai Silk Merchants' Association made appeals to the Government for measures of relief. In a telegram to the Government authorities the Association pointed out the following as causes of the depression of the Chinese silk trade: (1) Japanese competition, (2) high cost of production of Chinese raw silk due to high prices of cocoons and other expenses, and (3) competition of artificial silk on the domestic market. The Government was asked to exempt export duty on raw silk for the next five years.²⁸

Before the month was out fighting broke out between Chinese and Japanese troops in Chapei. Of the one hundred odd filatures in Shanghai 31 were situated in the Northern and Eastern districts, which were in or near the scene of hostilities. Of the 31 filatures at least 15 were damaged as a result of the fighting. A few in the Settlement got through the fighting undamaged, while the majority in the Chapei district were seriously damaged by shell fire. These filatures had a total of 6,328 reels, two dupion filatures being excluded. In the middle of March when the scene of hostilities shifted from the immediate neighborhood of Shanghai, only two, the Ewo with 508 reels and the Pao Tai Jen Kee with 208 reels were operating.²⁹

Demand for Chinese raw silk on foreign markets continued to be dull. In February only 16,324 lbs. valued at G.\$33,200 were shipped to America. Japanese silk prices again slumped, thus placing Chinese silk in a still less favorable position. To make matters worse, the filatures had much of their silk cargo held as security for loans and its value was so low as to make it hardly worth redeeming. According to one report, during February the stock in Shanghai warehouses amounted to about 25,000 bales, of which 15,000 bales

²⁸*Native Bankers' Monthly*, Vol. 12, No. 1.

²⁹*Bankers' Weekly*.

represent white steam filatures, 5,000 bales yellow silk and 5,000 bales tussah silk. The tussah and yellow silk was obviously the product of filatures in Shantung and other provinces, as the output of the local filatures is more or less confined to white silk. Another report says that at the beginning of April the stocks in hand in Shanghai was 20,000 bales, in addition to which there were about 100,000 piculs of dried cocoons, equivalent to another 17,000-20,000 bales of silk.⁸⁰ While stocks were accumulating, the market in foreign countries showed no improvement. During April, India purchased some parcels of silk but neither the American nor the European market showed any interest in local stocks at prices then prevailing. The press reported a single American purchase of 108,000 bales from Japanese Government at extremely favorable prices.

The spring cocoon crop of 1932 in Chekiang and Kiangsu was exceedingly poor, the harvests being much worse than either of the two previous years. Filatures which had sustained very heavy losses during the two preceding years now tried to reduce their cost of production by keeping down the prices of fresh cocoons. They attributed their difficulties to the high cost of production, and the fact was also fully recognized by the Government. In October, 1931, the Ministry of Industries issued an order to Shanghai filatures advising them to refrain from cutthroat competition among themselves in the purchase of cocoons. According to the Ministry, the cost of cocoons forms 75% of the total cost of production, which must be kept as low as possible. So when the new cocoon crop of 1932 appeared on the market, the filatures and cocoon merchants showed little keenness in buying and the prices offered were on the average only 50 per cent of those ruling in the two previous years.⁸¹ Thus the effect of the slump, which had hitherto been felt acutely by the silk merchants and silk filatures, now also told heavily on the farmers and laborers, for it caused widespread bankruptcy and unemployment.

(vi) Financial Aid to the Filatures

The gravity of the situation was, however, generally recognized and attempts were made by the Government and the bankers to

⁸⁰*Bankers' Weekly.*

⁸¹"Cocoon Crops of Chekiang and Kiangsu", Vol. XX, No. 24, *Chinese Economic Bulletin.*

ameliorate the situation. On May 18 all export duties and surtaxes on raw silk were abolished, a commission established in the previous year to help dispose of the accumulated stocks of raw silk was busy at work, and a subsidy of Tls. 100 was offered to silk merchants for every picul of raw silk sold to exporters and Tls. 20 to cocoon merchants for every picul of dried cocoons disposed of. Bankers were required to grant credit facilities to filatures or silk merchants as far as circumstances permitted in order to save the latter from insolvency. It was also proposed that in order to keep down the cost of production farmers must be advised to adopt new methods of raising silk worms in order to increase production and cheapen prices and that improvements must be introduced into the filatures by replacing the existing reeling machinery (generally of the Italian type) with more up-to-date models, because Italian machinery is unable to produce raw silk suitable for the American market, which is the greatest consumer of Chinese raw silk. When we carried out our second survey in May-July, 1932, 45 steam filatures and one dupion filature were in operation.

Reviewing the adverse effects brought about by the slump on different classes of people, the *Chinese Economic Bulletin* (Vol. XX No. 25, p.p. 361) says:—

“... In Chekiang the slump has affected the purses of many millions of people, for nearly two thirds of the population of the province are directly or indirectly interested in the silk industry to a greater or lesser degree. As a result of the suspension of the silk filatures in Shanghai and Wusih, nearly 200,000 persons have been thrown out of employment. In the Hangchow district large numbers of silk filature operatives are out of work, and of the 27 silk filatures in that area only two remain open.”

Meanwhile the situation was further aggravated by labor unrest. Towards the latter part of June signs of discontent were noticed among the operatives of three filatures in the Hongkew district, who demanded restoration of the original wage scale and working period. It may be mentioned that owing to the depression of the silk trade, the filatures had reduced the wage scale by approximately 20 per cent. For instance, an operative in the reeling department hitherto receiving 51 cents a day (1930 rate) was now paid at 42 cents. On June 26 the operatives of the three filatures in Hongkew first went on strike and were immediately joined by those of other filatures in the same dis-

trict. By that time the new silk season just commenced and many filatures reopened. The operatives in other parts of the town, believing that they could get better terms from their employers, did not hesitate to join in the movement. On July 1 the operatives of 15 filatures in Chapei walked out in sympathy with those in the Hongkew district. Through the good offices of the authorities of the Municipality of Greater Shanghai the strike was on July 9 brought to an end after protracted negotiations. It was agreed between the workers and the employers by arbitration to increase the wage of the fileuse to 45 cents a day, and the other workers in similar proportions. A similar strike attended with violence happened in Wusih about three months later. On October 9, the woman workers of the Wusih filatures went on strike in a body with violent disturbances resulting in damages to machinery and clashes with the police and the male workers. The unrest attracted the attention of the Kiangsu Provincial Government, which immediately appointed a delegation to investigate the case. The strike was settled on October 17 by arbitration.³²

In the autumn conditions improved to a certain extent. The export market for raw silk revived and the autumn cocoon crop, though the output was rather limited, was far more satisfactory than the spring crop. As the prices of the spring crop was only 25% of those of the two preceding years, the filatures were now able to turn out raw silk at much lower cost. The price of the spring crop was in certain cases only a little more than \$20 a picul for fresh cocoons, while the autumn crop, owing to more active buying and also to limited output, was sold at considerably higher prices. Filatures holding large stocks of dried cocoons made profits either by selling the cocoons or by spinning them into silk. Dried cocoons of the spring crop, which were produced in June at a total cost of \$100 or Tls. 70 a picul were sold at Tls. 125 a picul a couple of months later. The silk merchants could now keep down the cost of production to below Tls. 700 per bale and even at Tls. 700 they could still make a narrow margin of profit, if sold at the quotations ruling in September. So many silk filatures were only too glad to part with at least a portion of their accumulated stocks.

³²*Inspection and Commerce*, Vol. IV, No. 2, p. 11.

The revival of the silk market caused a brisk movement of raw silk to Shanghai from the interior. During the few weeks ending the middle of September, shipments of Shantung and Szechwan filatures continued to arrive and Wusih producers also contributed their quota. Many filatures in Wusih and Shanghai, which closed down during the spring and summer, were stimulated into activity by the improvement of the raw silk market abroad. Of the 49 filatures in Wusih only about a dozen were open during the spring cocoon harvesting season, but in the middle of September more than a score with a total of over 10,000 reels were operating, though some of them, being handicapped by lack of capital, could not work normally. The number of filatures operating in Shanghai was even smaller than in the summer when the strike was not yet called, being only 42 plus one dupion filature.³³

The revival was, however, a short-lived one; it soon relapsed into inactivity again. It is said that the boom, if it can be so called, was caused by manipulations of speculators abroad, rather than actual demand, of which there was little owing to the general economic depression in Europe and America.³⁴ In October the market in Shanghai was inactive with very few inquiries from abroad. To relieve the heavy accumulation of stocks, the Government in October authorized the issue of a loan of Tls. 2,200,000 by the Chekiang and Kiangsu authorities to subsidize the silk merchants. The sale of a picul of silk of the old stock or silk produced from cocoons of the 1931 or earlier crops was entitled to a subsidy of Tls. 100. A commission was appointed to register the old stocks of silk and cocoons in the hands of silk merchants in these two provinces.

In this connection it may be of interest to mention that the slump hit the filatures in Kwangtung just as badly. The export figure of Kwangtung silk for the first six months of 1932 showed a decrease of nearly two-thirds of a normal year. The number of silk filatures in that province is also decreasing year by year. In 1928, before the depression set in, there were 223 silk filatures. In 1931 only 108 could carry on, while in 1932 only 58 remained open.³⁵

³³This and the preceding paragraphs are based on an article: "The Autumn Silk Crop and Revival of the Silk Market" in the *Chinese Economic Journal*, Vol. XI No. 4.

³⁴*Chinese Economic Journal*, Vol. XI No. 4, p. 262.

³⁵*The Bankers' Weekly*.

CHAPTER III

SOME GENERAL STATISTICS

(i) Surveys of Shanghai Silk Filatures

Quite a few surveys have been made of Shanghai silk filatures during these years, some of which have been made in connection with industries in general, and others for the silk industry only. The Association of Silk Filatures as well as the Silk and Cocoon Association have also published their own records, although these are generally very simple, giving merely the names, addresses and the number of reels in each filature. The record of the former published in 1928, for instance, shows that there were in that year 104 silk filatures in Shanghai as against 37 in Wusih and 8 in Hangchow. The number of reels was 23,911, 10,062, and 2,056 respectively. In May, 1929, the Bureau of Social Affairs of the Municipality of Greater Shanghai listed 104 filatures in Shanghai, with a total number of 24,423 reels. This was published in a Chinese book entitled "The Industries of Shanghai." On the other hand, in a bilingual report of the same bureau entitled "Wages and Hours of Labor, Greater Shanghai, 1929," the total number of filatures is given as 107 and of reels as 24,906. These figures are said to have been based on a survey made by the Shanghai Association of Silk Filatures in May, 1929, and checked in certain instances by the Bureau itself in August of the same year. Although both reports refer to the same date—May, 1929—there are many filatures listed in the former and not in the latter, or vice versa, and we must therefore come to the conclusion that their sources of information are quite different. In fact, there are only seventy odd filatures which appear in both lists. The discrepancy will to some extent be explained below.

In April, 1930, the Shanghai Bureau of Inspection and Testing of Commercial Commodities of the Ministry of Industries made another survey of Shanghai filatures which was later published in its official Chinese organ called "The Foreign Trade Guide."⁸⁶ Although again the individual filatures, their location and other details do

⁸⁶Vol. I, No. 3, pp. 1-20.

not quite agree with the two lists of 1929, the total number of filatures happens to coincide with that in the second publication—namely, 107. The number of reels however is given as 25,395, which is therefore larger than either of the two other reports.

The China Institute of Economic and Statistical Research started its survey of Shanghai industries in May, 1931, and covered nearly all the silk filatures, along with many other industries, in three months. The result of this study gave the total of filatures then in operation as 70, and the number of reels as 18,326.³⁷ Lest this study should be incomplete, an investigator was sent to the Shanghai Silk and Cocoon Association to obtain the list from their records. According to the latter, there had been in Shanghai altogether 26,072 reels, of which 3,000 had been dismantled, leaving a total of 23,072 reels only. Not including those using the dupion cocoons, there were 101 filatures at that date, of which only about a half were in operation. This was what the officers of the Association told the investigator, but the list which he copied from them showed only 94 filatures. The time of that investigation took place in September, 1931.

Meanwhile, the Bureau of Social Affairs had been entrusted by the Ministry of Industries with the duty of inspecting the Shanghai factories, and for that reason it compiled a list of establishments which should be subject to regular inspection according to the law. The list was partly based upon the result of our industrial survey of May—July, and partly upon direct investigation of some of its own field workers. It included 63 filatures, the majority of which had been closed down at the time of the investigation, which was at about the same time that we approached the Silk and Cocoon Association.

In June and July, 1932, the Institute conducted another investigation of the filatures. The purpose was partly to check up the information obtained last year, and partly to find out the change that had taken place during the twelve months. As no other study has covered two consecutive years on the same basis, comparison cannot be so well made between them as between the data so secured ourselves. Till the end of June only 46 filatures had begun operation, operating 12,262 reels.³⁸

³⁷Including 4 dupion filatures operating 1088 reels.

³⁸Including one dupion filature operating 216 reels.

(ii) The Silk Season

We say "begun operation" because the silk reeling industry here is a seasonal affair. The season begins in the latter part of the fourth month of the lunar year, when the first shipment of new cocoons reaches this city. This corresponds approximately to May of the solar calendar, and the year, so far as the silk filatures are concerned, begins in May and ends in May of the following year. Since the operating firms seldom own the filatures, but generally rent them from others—a peculiar practice of this industry—the period of the lease also runs from May to May or June to June, depending upon how the two calendars correspond with each other. Sometimes the lease is only for a few months, and as soon as the first crop of cocoons is exhausted and the silk market is declining, the firms will quit their business. Later in the year, however, improved demand for silk may cause the filature to reopen under a different management, while the original operating firm may also go ahead and rent another filature to start operation there.

On account of the practices described above, a survey of the filatures must be completed within a short time, preferably in May, June and July. This was why we began with the silk industry for a second survey this year, because any delay would result in very great and incomparable changes, as may be seen from a comparison of our own list last year and that of the Bureau of Social Affairs last August for factory inspection purposes. Although the difference in time was only a month or two, nearly a half of the filatures covered by the first survey had already been closed down at the time of the second. Of course, the number and organization of the filatures this year differ also widely from those of last year, but we are sure at least that such differences are not due to seasonal influences.

We have taken great pains in checking over our own results with those of former surveys, as have been mentioned in the opening paragraphs of this chapter. Unfortunately, in the silk industry, this does not help much, because of the too frequent changes during recent years. It is quite a task to identify a filature in the former records with one included in our survey, for many reasons. Usually the former records do not give detailed addresses, and since most of the filatures are located on the same streets, to give merely the name of the street does not help identification at all. In some cases

there are a few names for the same street or the location of the filature is given as any one of the streets in its front, behind, or on either side. Then the street numbers certainly have changed more than once, and those occasionally given in the former records do not agree among themselves or with ours. Even the names of the filatures are often written differently, and the number of their reels, which seldom changes, also appears differently in different records. The Shanghai filatures generally have names for their plants in addition to the names of the firms operating the plants. The former are engraved on stone tablets inside the filatures, while the latter are given on sign-boards which are hung outside. It is through the former names that we identify the filatures covered by our two surveys, but in the records of other organizations the plant names are usually not given, thus making identification very difficult. In some cases, plant names are given for some filatures, and firm names for others, causing even greater confusion in the records. For these reasons we have been obliged to study what amounts to the history of the individual filatures, tracing it from 1929 till this day, and checking up with information obtained at first hand by our own investigators. A few samples of such a study are given in the following table.

TABLE IV
CHANGES IN SILK FILATURES

	I.	II.	III.
Owner	Shenlun Co.,	Hengfeng Co.	Hsiehan Co.
Address	55 Kwangfu Road (a)	37 Hengfeng Road	63 Kwangfu Rd. (b)
No. of reels	208	184	230
A. May, 1929	Possufu	Possufu, No. 2	Hsiehan
B. May-August, 1929	"	"	"
C. April, 1930	"	"	"
D. May-July, 1931	Fussu, No. 1	Fussu, No. 2	Hsiehan Kungkee
E. Aug.-Sept., 1931	"	"	"
F. Sept.-Nov., 1931	Fumin No. 1	Fumin No. 2	"
G. May-July, 1932	Closed	Tingkee	Chiatai
	(a) The street number has been changed to 1, Passage 659, Kwangfu Road.		
	(b) The street number has been changed to 735.		
	IV.	V.	VI.
Hsiehkee	Chinghwayung	Chinghwashun	Tachen Land Co.
330 Nanmeiyuan Rd.	351 Changan Road	225 Changan Rd.	Hengfeng Road., 530 Changan Rd.
260 (c)	240	160	240
Hsuehchangyung	Chinchangtai	Chengta, Wufeng	_____
"	"	Wufeng	_____
"	"	"	_____
Yungan	Fuchangjun	Closed	Chichang
_____	_____	Yungfu	Closed
Yungan	Fuchangjun	Wufeng	Chichang
Hsiatai	Tungchangtai	Closed (d)	Tunghsin

(c) According to our own investigation, the number of reels is 240.

(d) This filature was listed in the *Industries of Shanghai* under two names, as if it were two separate filatures. The name of the owner was not given, and the address of Chengta was given as Changan Road, without any street number. In September-November, 1951, it had already come under the management of the Yungfu firm, but the Silk and Cocoon Association still kept the firm Wufeng on its records. Recent investigation by ourselves established the identity of these supposedly separate filatures.

Another way of tracing the history of the individual filatures is to follow the removal of the operating firm from one filature to another. For instance, Chiufeng operated in 1929 a filature at 115 Tungchow Road, which had formerly been under the management of Jenfeng and then Sinsin, but a little later in the same year it moved to 1794 Chunghsin Road. At this place it operated a filature owned by a man named Chu Achiang, or rather half a filature, since there were 322 reels in this building, and Chiufeng only rented 162 reels. The remaining 160 reels were operated by another firm, Chiukang, which is closed down this year. Chiufeng's part of the filature is now operated by Kungkec. In one of the old records the address of Chiufeng was given as Tantsewan, which suggests that the firm had probably operated at that address too. As no detailed particulars were given and as there are a few filatures on that street, we are unable to ascertain which was the one formerly operated by this firm.

The firm Paotai was shown in the former records as operating at 20 Jihhwei Harbor in 1929 and 1930, having rented a filature formerly known as Chiuchen No. 3 mill. When our investigator reached the place in 1930, he found the street name changed to East Jihhwei Road, and the number to 153. A schedule was then filled, but when the same place was visited again this year, the filature had been converted into one of the Meiya silk weaving mills. Our investigator was informed that Paotai had moved to Lunghwa, where it operated the filature formerly run by Jihsin, also covered in our last year's survey. It was not until his arrival at the latter place that he reached the end of the story, for Paotai had only been there a few months last year, and the filature has been closed since the beginning of this year.

Another instance is the filature at 3 Ssuchanglung, Chuanchiaan Road. It was operated by Chenghsin during our survey last year, but later in the year that firm moved to another filature on Kwangfu Road. Meanwhile the former filature was rented for a few months

by the firm Yuyuan, and this year Yuyuan is operating at 145 Kuochin Road.

(iii) *Destruction and Dismantlement of Filatures*

Another factor which affected the filatures very much, as well as many other Shanghai industries, was the Japanese invasion of Shanghai in the first few months of 1932. Many of them were destroyed either by Japanese gunfire or by the incendiary bombs dropped from their airplanes. Although destruction was not complete in all cases, the owners of many filatures have hesitated to spend money on repairing them until there are good prospects of getting them rented. Filatures in the sections under Japanese occupation, especially the so-called D section from which the Japanese invaders did not withdraw until July 17, could not be operated at all, since no firm was willing to rent them. At least 15 filatures in the Chapei and neighboring districts, according to our investigation, have been either completely or partially destroyed.

Again, many filatures have been pulled down for an entirely different reason. The silk reeling business has not been profitable in recent years, and filatures often cannot be rented out, or only rented at very low rates. The owners of those that are better located generally find it more profitable to scrap the plants and build dwelling houses and business premises on the sites. Hence the dismantling of many filatures on Manchow, Chengtu, Markham, North Fukien, North Chekiang and North Soochow Roads. According to our investigation, at least 21 filatures have been so scrapped during recent years. Due to this and the Japanese destruction, the number of available filatures has been much reduced, and still some of them were not yet rented out as late as July. This alone is sufficient indication of the depression in the silk reeling industry.

The above gives some idea of the frequent changes in the management of the Shanghai filatures. Although our study covered only four years, from 1929 to 1932, we find out from this special study as well as from the answers to our question concerning the dates of their establishment and reorganization (question 5 in our principal questionnaire) that there were more changes in 1931 than in 1930, and still more in 1932. For instance, the filature Tingkang remained under the same management from May, 1929, to September, 1931,

but since that date the filature was transferred to Paoching, and by June, 1932, it was again reorganized under Yuankee. All the seven filatures in Table IV remained under the same management during the investigations conducted under A, B and C, but changed hands in 1931. However, this does not prove much because the first three investigations were all conducted during the same season from May, 1929, to April, 1930. (It is a great pity that no authoritative survey was carried out during the season between May, 1930, and April, 1931). However, a tabulation of the number of filatures established or reorganized in each year as we have found out through our own questionnaire will make the situation clearer. The following figures represent all the dates we have been able to ascertain, which are however not quite complete for all the filatures. Since we are interested in recording changes, we generally enter more than one date for one filature, whenever a change took place.

TABLE V
REORGANIZATION OF FILATURES

Before 1927	25	1930.....	19
1928	10	1931.....	23
1929	21	1932.....	32

(iv) Some Basic Statistics

From our own surveys and other available sources we are able to compile some simple statistics of the Shanghai silk industry for nearly a quarter of a century, and in recent years figures are available for both summer and fall, two important periods of the silk season. These figures, which are given in Table II, show that the industry had grown steadily from 1909 to 1930, except for the slight set-backs in 1921 and 1924. However, the great slump came in September, 1930, when nearly two-thirds of the existing filatures were closed down. In the next May the industry gradually revived, so that we were able to include in our survey from May to July as many as 70 filatures and 18,326 reels, or more than two-thirds the figures of 1930. Again they dropped in September when the Bureau of Social Affairs carried out the first inspection of Shanghai factories. Although the inspection data were admittedly incomplete, they showed, when the names of individual filatures are checked up, that at least 26 filatures covered by our survey of 1931 had suspended operation at the time of their

TABLE VI
SHANGHAI FILATURES CLASSIFIED ACCORDING TO DATE OF
ESTABLISHMENT OR REORGANIZATION

Date	1931 Survey		1932 Survey	
	No. of Filatures	Percent-age	No. of Filatures	Percent-age
1911	1	1.5		
1912				
1913				
1914				
1915				
1916				
1917				
1918				
1919	1	1.5		
1920				
1921				
1922	3	4.5		
1923				
1924	3	4.5	1	2.2
1925	3	4.6		
1926	6	9.1	1	2.2
1927	1	1.5		
1928	6	9.1		
1929	19	28.8	5	11.1
1930	20	30.3		
1931	3	4.6	3	6.7
1932			35	77.8
Total	66	100.0	45	100.0

inspection. Another slight revival came in at the beginning of the 1932 season, and our second survey included 46 filatures with 12,262 reels.

In the above account as well as in Table II both ordinary and dupion filatures are included. The latter, because of their exclusive use of dupion cocoons, are different in nature from the former, and the two cannot be compared in respect of their raw material, product, cost of production, capitalization, labor and wages, etc., etc. Hence in the following sections and the statistical tables therein we confine our discussion to the former only. That is why the number of filatures and reels for 1931 and 1932 in Table VIII showing their frequency distribution is smaller than that for the same years in Table II, since 4 dupion filatures are excluded in 1931 and one in 1932.

From an historical study of the raw silk prices in the Shanghai market, as shown in Table VII for years 1919 to 1932 inclusive on the following page, the same conclusion may be drawn as to the steady growth of the industry down to 1930, and the rapid decline since that date.³⁹ Whatever may be the price of raw silk abroad, in Shanghai in terms of silver tael it maintained a rather steady level of between 1,230 and 1,350 taels a picul for over three years. In October, 1930, it dropped below 1,200 taels, and in spite of the brief revival during the first few months of 1931, the decline was accelerated in that year and by June, 1932, it reached the unprecedented low level of 650 taels. The set-backs in 1921 and 1924 were also reflected in the prices of these years. In 1920 it dropped from 1,328 taels in March to 908 taels in December, thus arresting the growth of the industry in the following year. The decline of prices from 1,950 taels in September, 1923, to 1055 taels in October, 1924, means as great a fall in thirteen months, if plotted on a logarithmic scale, as that between May, 1931, and June, 1932. However, the effect of such a fall on the industry in 1924 was not so great because, perhaps, the price was still high enough to yield some profit to the filatures.

Besides the question of growth, the size of the filatures can also be seen from the statistics of filatures and reels. Table VIII, showing the frequency distribution of filatures by the number of reels in class intervals of 50 reels each, is quite instructive. The class limits are fixed at 50.1—100, 100.1—150, etc., instead of the more common limits of 50—99.9, 100—149.9, etc., because a similar study of 1930 is available in which the class limits are so fixed. Since the original data of that year are not available, we cannot change their figures so as to be comparable with ours, but are obliged to fix our class limits according to their plan. The result of this comparison is however very interesting. It shows that in all three years over 65 per cent of the filatures had from 151 to 250 reels, and in 1931 and 1932 for which such data are available, over 50 per cent of the reels were in the filatures of this size.

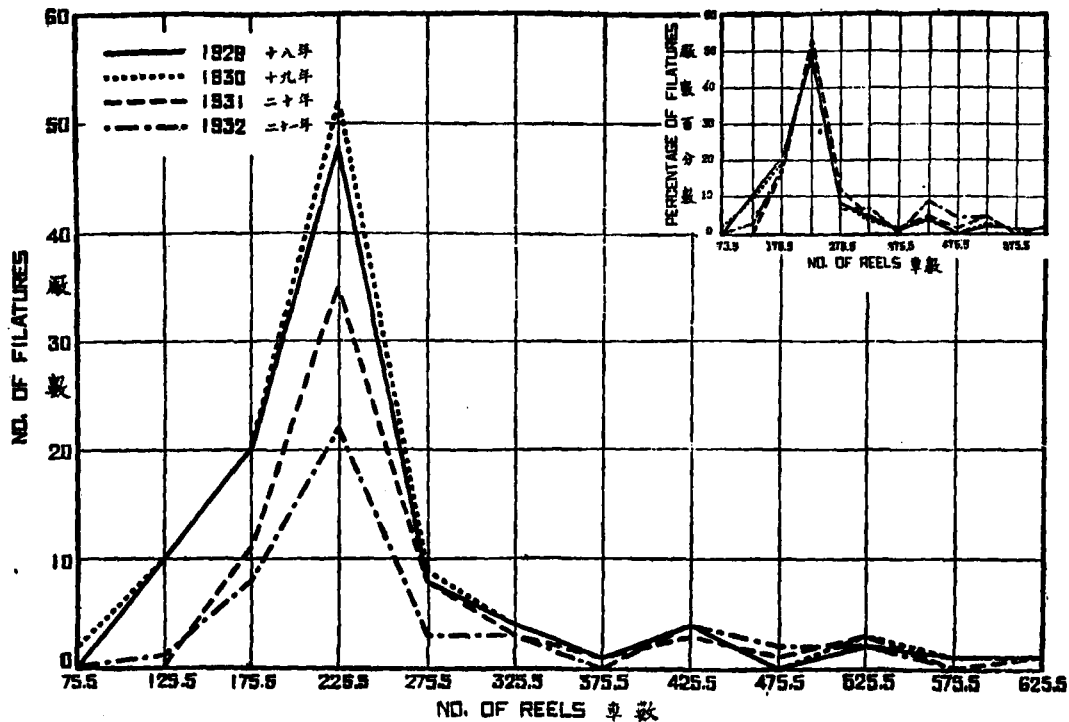
In 1930 there were some very small filatures, having only 100 or fewer reels. The figures for the following year seem to indicate

³⁹The price fluctuations were those of one particular brand of steam filature silk recorded formerly by the Bureau of Markets and now by the National Tariff Commission, and supplied to us by special arrangement with the Commission.

a weeding out of the very small filatures, since there was none with 150 or fewer reels in that year, while in 1930 they formed over 10 per cent of the total. In 1932, because most filatures were operated under special contracts with banks, the tendency was again towards smaller filatures and 20 per cent had 200 or fewer reels. At the same time the largest filature existing in the previous years, Jui Lun, was dismantled. By comparing filature with filature for the years 1931 and 1932, we find that many filatures are only partly rented out this year, and the remaining portion of the equipment unoperated, thus bearing out the fact indicated in the table.

FIG. 3. NUMBER OF REELS IN SHANGHAI FILATURES

上海絲廠絲車數次數分配圖



*

TABLE VIII
NUMBER OF REELS IN SHANGHAI FILATURES

Number of Reels*	Mid-value	1929		1930		1931		1932							
		No. of Filatures	Percentage	No. of Reels	Percentage	No. of Filatures	Percentage	No. of Filatures	Percentage	No. of Reels	Percentage				
51—100	75.5					2	1.9								
101—150	125.5	10	10.1	1,350	5.8	10	9.3					1	2.2	144	1.3
151—200	175.5	20	20.2	3,551	15.2	20	18.7	11	16.7	1,986	11.5	8	17.8	1,452	12.0
201—250	225.5	48	48.5	10,622	45.5	52	48.6	35	53.0	7,796	45.2	22	48.9	4,946	41.0
251—300	275.5	8	8.1	2,114	9.1	9	8.4	8	12.1	2,180	12.7	3	6.7	804	6.7
301—350	325.5	4	4.1	1,350	5.8	4	3.7	3	4.6	984	5.7	3	6.7	984	8.2
351—400	375.5	1	1.0	352	1.5	1	1.0	1	1.5	360	2.1				
401—450	425.5	4	4.0	1,704	7.3	4	3.7	3	4.6	1,248	7.3	4	8.9	1,712	14.2
451—500	475.5							1	1.5	472	2.7	2	4.4	960	8.0
501—550	525.5	2	2.0	1,048	4.5	3	2.8	3	4.5	1,584	9.2	2	4.4	1,044	8.7
551—600	575.5	1	1.0	600	2.6	1	1.0								
601—650	625.5	1	1.0	628	2.7	1	.9	1	1.5	628	3.6				
Total		99	100.0	23,319	100.0	107	100.0	66	100.0	17,238	100.0	45	100.0	12,046	100.0
			M=235.55				M=253.33				M=261.18				M=267.69
			Mo=215.29				Mo=216.12				Mo=226				Mo=221

*The class limits are so fixed because the 1930 data are given in that form and in no other.

TABLE VII
SHANGHAI SILK PRICES*

	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932
January	.....	1251.875	938.750	1498.333	1580.000	1610.000	1150.000	1400.000	1370.000	1230.000	1320.000	1250.000	1220.000	1030.000
February	.....	—	1060.000	1502.500	1650.000	1580.000	1240.000	1320.000	1330.000	1290.000	1320.000	1280.000	1280.000	1000.000**
March	.....	1328.000	1135.000	1530.000	1590.000	1515.000	1210.000	1280.000	1350.000	1300.000	1325.000	1280.000	1280.000	960.000**
April	.....	—	1185.000	1375.000	1640.000	1380.000	1200.000	1260.000	1400.000	1300.000	1250.000	1280.000	1240.000	900.000
May	.....	1260.000	1190.000	1322.000	1760.000	1420.000	1200.000	1160.000	1450.000	1300.000	1260.000	1230.000	1150.000	740.000
June	.....	1202.500	1228.000	1335.000	1780.000	1140.000	1200.000	1200.000	1330.000	1300.000	1250.000	1350.000	1100.000	650.000
July	.....	1242.500	1282.000	1378.750	1720.000	1200.000	1180.000	1200.000	1280.000	1280.000	1300.000	1300.000	1180.000	670.000
August	.....	1150.000	1270.000	1404.000	1660.000	1200.000	1190.000	1200.000	1280.000	1280.000	1280.000	1300.000	1160.000	750.000
September	.....	1110.000	1262.500	1410.000	1950.000	1100.000	1225.000	1240.000	1285.000	1340.000	1310.000	1260.000	1150.000	770.000
October	1013.667	1075.000	1250.000	1590.000	1840.000	1055.000	1250.000	1400.000	1290.000	1340.000	1300.000	1160.000	1140.000	740.000
November	1069.896	980.000	1274.000	1650.000	1780.000	1120.000	1265.000	1430.000	1260.000	1330.000	1250.000	1100.000	1080.000	730.000
December	1115.000	908.000	1390.000	1580.000	1720.000	1220.000	1275.000	1420.000	1180.000	1330.000	1250.000	1100.000	1050.000	740.000

*These quotations were recorded by the National Tariff Commission, and supplied to us through its courtesy. They refer to one brand of high grade white steam filature silk, known as the "Double Golden Stag" brand.

**On account of the Japanese invasion of Shanghai, no investigation could be made and the National Tariff Commission had to make estimates for these months.

CHAPTER IV

FORM OF ORGANIZATION

(i) Partnership—the Prevalent form of Organization

Nearly all Shanghai filatures are operated by partnership firms. In 1931 there were one single proprietorship, one unlimited liability company, and three limited liability companies. In 1932 there were three proprietorships and one unlimited liability company. There is no question with the unlimited liability company or the proprietorships, but the status of those that claimed to be limited liability companies in 1931 is very doubtful. It is generally known that no filature was so organized. It is probable that those three cases which claimed this status merely considered themselves as such, but had not properly registered with the Government. Such cases are not uncommon with Chinese firms, although they have no legal status until they have registered. Seven filatures failed to give the form of their organization in the questionnaire in 1931 and one used an ambiguous term in reply. All these filatures were most probably operated by partnerships. A much larger number in 1932 also gave no reply but the same interpretation could not be applied there. With a very few exceptions, they were operated by silk men on behalf of banks, to be explained in detail later, and no capital was supplied by the former. The following table shows the number of filatures operated under the different forms of organization in these two years.

TABLE IX
FORM OF CAPITAL ORGANIZATION OF THE FILATURES

	1931	1932
Partnerships	57	24
Proprietorships	1	3
Limited liability companies	3	0
Unlimited liability companies	1	1
Not known	8	18
	—	—
	70	46

The prevalence of partnerships in the silk industry does not mean, however, that the few partners supply all the capital necessary to carry on the business. On the contrary, they put up only what we may call the initial working capital to get the business started, and the additional funds are obtained from banks as loans or individuals as loans or deposits. The latter is a prevailing custom in China and friends and acquaintances of a business firm often leave their surplus funds on deposit with the firm and are paid a fixed interest at a rate usually higher than what they can get from the banks but lower than what the firm has to pay the banks for loans.^{39A} In other words, they cut out the bank as a financial middleman and arrange for direct investment with the owners of the funds.

However this may be, the amount obtainable from such individuals is very much limited, as the number of relatives, friends and acquaintances who have funds available for deposit cannot be large, and they are usually not large capitalists, for the latter would have business interests of their own or other forms of investment. For the larger portion of credit the filatures must still go to the banks, and generally it is the native banks with which they do most of their business. The modern banks prefer lending money on securities to lending on merchandise, but the filatures have only the latter to offer. In their purchases and sales no commercial paper is used, nor is there any bill market in Shanghai, although a few leading banks here are encouraging the use of such paper. However, it will take years yet before the silk merchants will take to such practices, and for the time being they seem to be quite satisfied with the service of the native banks. Tables X and XI show the capitalization of the filatures by filature and capitalization per reel.

(ii) Capitalization of the Filatures

In the first table we are fortunate in being able to secure similar data for two previous years, 1929 and 1930, but unfortunately our own data for 1932 are very meagre. This is because most of the filatures this year are operated under an entirely different plan,⁴⁰ and

^{39A}Although in Table XV the interest rates payable to individuals are sometimes higher than those to banks, they are really lower when we consider the much longer periods of the individual loans.

⁴⁰Most filatures this year are operated by merchants on behalf of native banks, which pay them so much per reel per month for the cost of operation. The cocoons are supplied by the banks and the silk sold by them.

TABLE X
CAPITALIZATION OF SHANGHAI FILATURES

Capital (in taels)	Mid- value	1929				1930				1931				1932			
		No. of Filatures	Per- cent- age	Amount of Capital	Per- cent- age	No. of Fila- tures	Per- cent- age	No. of Filatures	Per- cent- age	Amount of Capital	Per- cent- age	No. of Filatures	Per- cent- age	Amount of Capital	Per- cent- age		
5,000— 9,999	7,500					8	8										
10,000— 14,999	12,500	8	8.2	98,600	3.9	13	13					4	36.3	44,400	13.4		
15,000— 19,999	17,500	17	17.3	259,900	10.8	40	40	8	12.1	127,000	6.3	1	9.1	16,000	4.8		
20,000— 24,999	22,500	37	37.8	752,100	31.3	11	11	14	21.2	291,600	14.6	1	9.1	20,000	6.1		
25,000— 29,999	27,500	1	1.0	27,000	1.1	17	17	6	9.1	156,000	7.8						
30,000— 34,999	32,500	21	21.4	630,000	26.2	3	3	23	34.8	690,000	34.5	2	18.2	60,000	18.2		
35,000— 39,999	37,500	3	3.1	108,000	4.5	5	5	2	3.1	71,000	3.6						
40,000— 44,999	42,500	5	5.1	200,000	8.3			7	10.6	280,000	14.0	1	9.1	40,000	12.1		
45,000— 49,999	47,500					1	1	1	1.5	45,000	2.2						
50,000— 54,999	52,500	4	4.1	200,000	8.3			2	3.1	100,000	5.0	1	9.1	50,000	15.1		
55,000— 59,999	57,500	1	1.0	55,000	2.3	1	1										
60,000— 64,999	62,500							1	1.5	60,000	3.0						
65,000— 69,999	67,500																
70,000— 74,999	72,500					1	1										
75,000— 79,999	77,500																
80,000— 84,999	82,500	1	1.0	80,000	3.3			1	1.5	80,000	4.0						
85,000— 89,999	87,500																
90,000— 94,999	92,500																
95,000— 99,999	97,500																
100,000—104,999	102,500							1	1.5	100,000	5.0	1	9.1	100,000	30.3		
Total		98	100.0	2,405,600	100.0	100.0	100.0	66	100.0	2,000,600	100.0	11	100.0	330,400	100.0		
		M=24,546.94				M=21,025.00		M=30,312.12				M=30,036.36					
		Mo=22,340.43				Mo=17,857.14		Mo=31,551.73				Mo=15,000.00					

TABLE XI
CAPITALIZATION PER REEL

Capital Per Reel (in taels)	Mid-value	1929		1931		1932	
		No. of Filatures	Percent-age	No. of Filatures	Percent-age	No. of Filatures	Percent-age
20—29	25					1	9.1
30—39	35						
40—49	45			1	1.5	2	18.1
50—59	55	3	3.1				
60—69	65	4	4.1	3	4.6	1	9.1
70—79	75	8	8.2	2	3.0		
80—89	85	15	15.3	5	7.6	2	18.2
90—99	95	25	25.5	10	15.2	1	9.1
100—109	105	11	11.2	8	12.1	1	9.1
110—119	115	8	8.2	5	7.6		
120—129	125	8	8.2	11	16.7		
130—139	135	6	6.1	4	6.1		
140—149	145	4	4.1	9	13.6		
150—159	155	2	2.0	3	4.5		
160—169	165			2	3.0		
170—179	175	1	1.0				
180—189	185			1	1.5	1	9.1
190—199	195			1	1.5	1	9.1
200—209	205	1	1.0				
210—219	215			1	1.5	1	9.1
220—229	225						
230—239	235						
240—249	245						
250—259	255						
260—269	265	1	1.0				
270—279	275						
280—289	285						
290—299	295	1	1.0				
Total		98	100.0	66	100.0	11	100.0
		M=105.40		M=117.39		M=103.18	
		Mo=94.52		Mo=124.81		Mo—not clearly discernible	

they have no capital whatever of their own. It may be seen from this table that about 65 per cent of the filatures in 1929 and 1930 had a capitalization between 10,000 and 25,000 taels and in 1931 between 20,000 and 35,000 taels. The 1932 figures are so meagre that no concentration is perceivable. Judging from these figures, it would appear that in 1931, on account of the bad conditions of the industry, those firms of smaller capitalization had been weeded out and the surviving and newly organized ones had larger capital to cope with the situation.

Capitalization per reel is of twofold significance: first, because the size of a filature, the number of its workers, the quantity of raw material required and silk produced have direct relation to the number of reeling basins in the filature, and second, because these figures show the relation between the amount of working capital of the operating firm and the value of the plant. It was estimated in 1930, during our preliminary investigation of a number of Shanghai industries, that the value of a silk filature amounted to approximately 100 to 150 taels per reel, which figures included not only that of the machinery, but also the building, the site (except where it was at a business center where the value of the land might be very high) and all other necessary equipment.^{40A} Such estimates are however only estimates, as the existing filatures had been constructed many years ago, and they were in different degrees of depreciation. Since almost all Shanghai filatures are rented by their owners to operating firms, their value can be better ascertained on the basis of the rental income receivable by their owners. This rental, too, is on the basis of so much per reel, hence the significance of this unit in gauging the adequacy of the working capital.

According to our investigations, the rental per reel in 1931 varied from 2.40 to 4.00 taels a month, depending upon the location of the plant and the condition of the equipment. Thus the annual rental amounted to from 28.80 to 48.00 taels, and if we capitalize it at 10

^{40A}Another estimate gives 60 taels per reel as the cost of the machinery, and 200 taels per reel as that of the building housing the machinery. Although this figure agrees better with the annual rental of 28.80 to 48.00 taels as given in the next paragraph, yet the cost of machinery and building so estimated is a little out of proportion to each other, the former being a little too low. Vide "Shanghai Silk Filatures" in the *Chinese Economic Journal*, Vol. III, No. 1.

per cent, we arrive at a value of 288 to 480 taels per reel. This is much higher than the estimate given above, but the difference may be due to a higher rate of the rent, say 25-30 per cent per annum, or a low estimate of the value by the silk merchants. The amount of working capital per reel did not exceed 220 taels last year, showing what proportion it represented to the total value of the plant.

Besides comparing the amount of the initial working capital with the value of the plant, there are a few other ways of gauging the adequacy or inadequacy of this capital. In Tables XII, XIII and XIV we show the percentage relation between the cost of the raw material required every month, the amount paid out last year as salaries and wages⁴¹ and the value of last year's output respectively, on the one hand, and the amount of the working capital on the other. In the first case there were in 1931 eleven filatures which had enough money of their own to buy the necessary raw material for one month, but not so with all the rest. In these filatures the monthly raw material cost was from a few to 150 per cent more than the amount of the working capital. If the annual instead of the monthly cost be taken into consideration, then in all cases it would be 7-30 times larger. Salaries and wages did not amount to such high figures, and their annual sums were at most 180 per cent larger than the initial working capital. Were the turnover not so quick and bank credit not so readily available, few of the filatures would be able to do any business at all.

The value of last year's output was naturally much higher than the monthly raw material cost or annual labor cost and management overhead, hence it was 100—2050 per cent larger than the initial capital. Were this due entirely to quick turnover, the profit in this industry would be unusually large, because even a 10 per cent profit on the value of the output would mean a 20-215 per cent dividends on the capital. Unfortunately, the filatures had to pay rather heavy interest for the utilization of other capital to supplement their own, and such fixed charges left little margin of profit to the operating firms themselves. Why the annual raw material cost was higher than the value of last year's output and why labor wages are not separated from

⁴¹In our questionnaire these two items are given separately, but, as will be explained in another connection, they could not be separated in the case of silk filatures.

TABLE XII
PERCENTAGE RELATION BETWEEN CAPITAL AND MONTHLY
COST OF RAW MATERIAL

Percentage Relation	Mid-value	1931	
		No. of Filatures	Per Cent of Total
60.00— 79.99	70	2	3.2
80.00— 99.99	90	9	14.3
100.00—119.99	110	8	12.7
120.00—139.99	130	16	25.4
140.00—159.99	150	8	12.7
160.00—179.99	170	7	11.1
180.00—199.99	190	8	12.7
200.00—219.99	210	2	3.2
220.00—239.99	230	2	3.1
240.00—259.99	250	1	1.6
Total		63	100.0
	M=138.91%		
	Mo=129.38%		

TABLE XIII
PERCENTAGE RELATION BETWEEN CAPITAL AND ANNUAL
SALARY AND WAGE PAYMENTS

Percentage Relation	Mid-value	1931	
		No. of Filatures	Per Cent of Total
40.00— 59.99	50	1	1.7
60.00— 79.99	70	1	1.7
80.00— 99.99	90	6	10.4
100.00—119.99	110	4	6.9
120.00—139.99	130	9	15.5
140.00—159.99	150	6	10.3
160.00—179.99	170	7	12.1
180.00—199.99	190	3	5.2
200.00—219.99	210	6	10.3
220.00—239.99	230	6	10.3
240.00—259.99	250	7	12.1
260.00—279.99	270	2	3.5
Total		58	100.0
	M=170%		
	Mo=131.30%		

TABLE XIV
PERCENTAGE RELATION BETWEEN CAPITAL AND VALUE OF ANNUAL OUTPUT

Percentage Relation	Mid-value	1931	
		No. of Filatures	Per Cent of Total
200.00—349.99	275	1	1.6
350.00—499.99	425	2	3.3
500.00—649.99	575	7	11.5
650.00—799.99	725	5	8.2
800.00—949.99	875	5	8.2
950.00—1099.99	1025	7	11.5
1100.00—1249.99	1175	12	19.7
1250.00—1399.99	1325	6	9.8
1400.00—1549.99	1475	7	11.5
1550.00—1699.99	1625	6	9.8
1700.00—1849.99	1775	1	1.6
1850.00—1999.99	1925		
2000.00—2149.99	2075	2	3.3
Total		61	100.0
	M=1,117.61%		
	Mo=1,178%		

salaries are explained in another section in connection with cost of production. All that we want to make clear here is the very small amount of capital that the operating firms put up in this business.

(iii) Financing by Native Banks

As has been mentioned above, the filatures are to a very large extent financed by native banks. Their contact begins at the time of purchasing the cocoons. Suppose the firms send their own agents to buy fresh cocoons in the interior, say, Hangchow, an arrangement is first made with a Shanghai native bank for three months credit. A cash deposit amounting to approximately 30 per cent of the credit granted should be made at the bank, and in addition a guarantor is usually needed unless the firm is of very good standing. The total amount arranged will then be remitted or transferred in actual cash (silver dollars, for instance, which accounts for the seasonal variation in the Shanghai silver stock) to Hangchow, which really means that

the firm forms a sort of partnership with the bank in the purchase of cocoons, the former putting up one-third and the latter two-thirds of the necessary capital. At a cocoon house the firm's representatives will begin to buy fresh cocoons from the farmers who bring their goods to the place, and the bank's representatives will make all the payments. After the cocoons have been dried on the ovens, they are shipped to Shanghai and stored at a warehouse designated by the bank, and the warehouse receipt remains in the hands of the latter. Any quantity to be withdrawn from the warehouse must therefore be made with the knowledge and approval of the bank, and until the loan is fully repaid the cocoons cannot be entirely taken out. Usually the filatures withdraw from time to time a certain quantity of cocoons from the warehouse, manufacture them into silk, sell the product, and repay a portion of the loan with the proceeds of the sale. If three months are not sufficient for the complete "amortization" of the loan, the period may be extended. In fact, this is in a sense inevitable, since the filature depends on bank credit almost throughout the year, although the loan is not always made for the purchasing of raw materials.

Since the rental of the plant, the cost of the fuel, and the salaries and wages do not amount to very much every month, there is little need of credit to meet these expenses. The credit element comes in again in connection with the sales. As the filature must realize on its product quickly in order to repay the bank loan on cocoons and withdraw them for manufacturing as soon as the stock in its own storehouse is exhausted, it generally arranges with the banks or silk brokers—known as *ssu-hao* (絲號)—to advance it money on the silk already manufactured. Sometimes a warehouse receipt, sometimes the silk itself, is used as security for such loans. The amount of such loans may go up to 70 or 80 per cent of the value of the silk. If the silk is already sold to some foreign exporting firm, but payment cannot be made until the goods are delivered at the wharf, then advances may be obtained from the *ssu-hao* for a few days at the current daily interest rate of the native bank plus $5\frac{1}{2}$ taels per thousand per mensem. For the longer loans, which may run from one to six months, the rate varies with the credit of the firm, the length of the period, and the conditions of the silk and money markets. Seventeen filatures supplied us information about such interest rates last year, and it is tabulated below.

TABLE XV

INTEREST RATES ON BANK LOANS AND INDIVIDUAL DEPOSITS
(per mille per mensem)

Filature	Bank Loans		Individual Deposits	
	Max.	Min.	Max.	Min.
A	11	7	12	12
B	12	9	—	—
C	8	6.5	10	8
D	18	8	10	8.3 (a)
E	10	8	—	—
F	6.75	5.625 (d)	—	—
G	9	8	—	—
H	8	6	—	—
I	9.50	8.5	—	—
J	11	9	—	—
K	8	6.5	—	—
L	21	6 (d)	—	—
M	10	7	—	—
N	8.5	7.5	—	—
O	10	8.5	10	10
P	10	8	10	10
Q	10	6	10	10

(a) converted from annual rate.

(d) converted from daily rate.

Excepting cases D and L, which reported very high maximum rates on bank loans which we consider to be for loans under exceptional circumstances, the rest varied between 6 and 12 per mille per mensem, corresponding to 7.2 and 14.4 per cent per annum respectively. Both filatures F and L gave daily rates, which fluctuated from day to day, and were applied to short term loans. Since the rate quoted by the former applied to a loan of 40,000 taels then outstanding, and the latter to one of 100,000 taels, they were both actual daily rates, the fluctuations of which were often very wide, and would convey a wrong impression if taken as the monthly or yearly rate. For instance, if the high rate of 21 per mille per mensem prevailed only on one day of the month, and for all other days the rates were below 10 per mille, the average monthly rate would still be below 10 per mille. The data in this table are so few that we do not consider it worthwhile to summarize them statistically. On the other hand, their listing by individual filatures shows that in many cases the rate on bank loans was lower than that on individual deposits, which is to be explained by the fact that the latter are generally for longer periods.

CHAPTER V

THE RAW MATERIAL

(i) *The Cocoon Supply*

The most important as well as only raw material for the manufacture of raw silk is silkworm cocoons. They are widely produced in the provinces of Kiangsu, Chekiang, Anhwei, Kwangtung, Szechwan, Shantung, Hupeh, Liaoning (Fengtien), etc., but in some of them like Shantung and Liaoning the cocoons are those of the tussah silkworms, and not fit for the production of white steam filature silk. For the supply of the Shanghai filatures the cocoons come principally from Kiangsu and Chekiang, although a small quantity is also supplied by Anhwei. That is why the Silk and Cocoon Association in Shanghai is known as the Kiangsu, Chekiang and Anhwei Silk and Cocoon Association, because these three provinces really form one single silk region by themselves. As our study is concerned with the silk industry of Shanghai, we will confine our discussion of the raw material to the cocoons of these three provinces, and more particularly of Kiangsu and Chekiang, as these two provinces yield over 95 per cent of the total supply.

In Chekiang the principal cocoon-producing districts are Hangchow, Kashing, Huchow, Haining, Hsiaoshan, Pinghu, Chuhsi, Yuhang, etc. According to one authority⁴² there were over 780 cocoon houses in 1929 producing approximately 400,000 piculs of dry cocoons, but their number decreased to somewhere around 400 and their production to 300,000 piculs in 1930. The principal cocoon-producing districts of Kiangsu are Wusih, Changchow, Kiangying, Liyang, Kintan, Chinkiang, Tanyang, Yihsin, Soochow, Wukiang, Kiangtu, Kunshan, Yangchung, etc. There were over 100 cocoon houses in these districts in 1930 producing 100,000 odd piculs of dry cocoons. An investigation by the Provincial Board of Agriculture and Mining in 1929 showed that the quantity of dry cocoons produced in that year was 144,400 piculs. There was therefore also a curtailment of

⁴²T. S. Miao, "Shanghai Silk Filatures", *Foreign Trade Guide*, Vol. I, No. 3.

production in 1930. The quantity of cocoons produced in Anhwei was estimated at less than 20,000 piculs.

Later figures from Chinese sources are unavailable, but the Central Association of Japanese Silk Industry gave the following figures for, according to a Chinese publication of July, 1932,⁴⁸ "a very recent date":—

TABLE XVI
COCOON PRODUCTION BY PROVINCE

Province	Cocoon Production (Piculs)
Chekiang	1,140,000
Kwangtung	1,057,400
Kiangsu	545,000
Szechwan	468,000
Hupeh	122,900
Shantung	110,000
Anhwei	97,100
Kwangsi	55,600
Honan	42,900
Shansi	6,500
Fukien	3,900
Other Provinces	13,000
Total	3,662,300

These figures apparently refer to the quantity of fresh cocoons produced. Since it takes from 300 to 350 piculs of fresh cocoons to make 100 piculs of dry cocoons, the Chekiang production would be equivalent to between 380,000 and 330,000 piculs, that of Kiangsu to between 181,600 and 155,700 piculs, and that of Anhwei to between 32,300 and 27,700 piculs of the latter.

(ii) *The Three Crops*

There are in general three crops of cocoons a year in these provinces: (1) the spring crop which is the largest of all three, supplies the major portion of the filatures' raw material for the whole year, and appears on the market in April and May, corresponding to the opening season of the silk filatures; (2) the summer crop which

⁴⁸Wu Men-yen, "Revival of the Silk Industry", *Foreign Trade Guide*, Vol. IV, No. 2.

comes two months later and is of a negligible quantity; and (3) the autumn crop which appears on the market after another two months, and whose quantity is being increased during the recent years. When the farmer has raised a crop of fresh cocoons, he generally brings it himself to some cocoon house in the nearby town or market place, bargains for the price, and sells it for cash. In a few localities like Shaohing (Chekiang), Liyang and Kintan (Kiangsu) where the country is hilly and it takes the farmers too much time to go to the cocoon houses, there are small cocoon dealers who act as middlemen for them. These dealers are known in Chekiang as *paila* (白拉) because they do the business without any official license. They generally collect the cocoons from the farmers and make a profit by paying a lower price to the farmers and obtaining a higher price from the cocoon houses. Sometimes they also maintain small shops where the farmers may bring their cocoons for sale.

As has been pointed out above, fresh cocoons have to be dried before they are sold to the filatures, and the drying process is carried out in the cocoon houses. Each of these has a number of ovens—some of the “single” type where charcoal is used for heating purposes and some of the “double” type where firewood is used. In the single oven the fire is below the cocoons, while the double oven has a chimney in the middle, and the cocoons are baked on both sides of it. The fire is kept up day and night during the season, and during a spring season of some three weeks a single oven can bake 15-16 piculs of dry cocoons and a double one about 30 piculs. Thus the cocoon houses serve both as an agency for the collection of raw material and a plant where it is prepared for use by the filatures. As dry cocoons are lighter in weight and more easily preserved, thus more suitable for transportation than fresh ones, the cocoon houses are all located in the cocoon-producing districts, and not in Shanghai.

Under the Manchu dynasty and the Peiping regime of the Republic, there were laws limiting the establishment of cocoon houses in the so-called silk districts. As a result, those already established enjoyed a form of monopoly, and the farmers had to sell their cocoons to them at the prices they offered. Many farmers did not care to sell their cocoons, but used antiquated methods and implements to reel their own silk, which affected the growth and development of the steam filatures. The National Government abolished their

application to Kiangsu in 1927, and since then in both "silk" and "cocoon" districts of the province any Chinese national may apply to the Government for a license to establish a cocoon house. However, in a district where the existing capacity already exceeds the estimated average annual production of cocoons by 20 per cent, no more license will be issued except for the installation of improved ovens and equipment.

(iii) Operation of the Cocoon Houses

Like the silk filatures the cocoon houses of Kiangsu and Chekiang have two kinds of proprietors—the proprietors of the houses themselves and the business proprietors who run them. The latter rent the houses from the former at so much an oven for the season. In Kiangsu it was formerly \$100 per double oven, but the amount may be more or less depending upon the condition of the ovens and their accessories, the location of the house, as well as upon the demand for and supply of such facilities at the time.⁴⁴ In 1926 and 1927, when the silk industry was very prosperous, the rent of a cocoon house with a capacity to turn out 300 piculs of dry cocoons in the spring season, which means one equipped with approximately ten double or twenty single ovens, would be around \$1,500 for the season. This works out at \$150 per double oven. About 60 per cent of these houses were rented by the silk filatures, and the remainder by the so-called cocoon merchants who specialized in the buying, preserving and selling of cocoons. This year only about 10-20 per cent are operated by silk filatures, 20-30 per cent by cocoon merchants, and the rest by the owners of the houses or closed down. The rent has also fallen to about a third of their former rate.

When a filature does not rent a cocoon house, it may make certain arrangements to insure a regular and adequate supply of dry cocoons. It may arrange with a particular cocoon house to buy and prepare cocoons exclusively for its use, and advance a sum of money to the latter. The quality and price of the dry cocoons are agreed upon beforehand, but otherwise the filature leaves everything to the cocoon house. Or the filature may appoint a few men

⁴⁴The cocoons have three seasons corresponding to the three crops, and the cocoon houses are rented for the principal or spring crop which lasts about three weeks. Rents for other seasons are lower.

to stay in the cocoon house and supervise the purchases. The operators of the cocoon house will buy the cocoons as usual, but they must be submitted to the examination and reweighing by the representatives of the filature before they are baked. Payment is also made directly by the latter, to the seller of the cocoons, immediately after they are examined. For the baking of one picul of cocoons a sum of \$20 to \$40 is paid to the operators of the cocoon houses, who not only bear the expenses of the fuel and labor, but also supply board and lodging to the filature representatives. If none of these arrangements have been made, then the filature simply buys the dry cocoons on the market.

As there are no cocoon houses in Shanghai, the Shanghai filatures sometimes send buyers to the interior for the cocoons. However, the

TABLE XVII
QUANTITY OF COCOONS REQUIRED EVERY MONTH

Quantity (piculs)	Mid- value	1931				1932			
		No. of Filatures	Percent- age	Quantity	Percent- age	No. of Filatures	Percent- age	Quantity	Percent- age
100—129.99	115	2	3.0	230.00	1.3				
130—159.99	145	4	6.1	600.00	3.4	1	2.4	154.00	1.3
160—189.99	175	10	15.1	1,738.00	10.0	2	4.7	370.80	3.0
190—219.99	205	11	16.7	2,252.00	12.9	3	7.1	618.00	5.0
220—249.99	235	6	9.1	1,427.00	8.2	12	28.6	2,808.20	22.8
250—279.99	265	11	16.7	2,878.00	16.5	7	16.7	1,827.00	14.9
280—309.99	295	8	12.1	2,360.48	13.6	7	16.7	2,030.00	16.5
310—339.99	325	5	7.6	1,652.00	9.5	4	9.5	1,413.40	11.5
340—369.99	355								
370—399.99	385								
400—429.99	415	2	3.0	800.00	4.6				
430—459.99	445	3	4.6	1,340.00	7.7				
460—489.99	475								
490—519.99	505	2	3.0	1,003.00	5.8	4	9.5	2,008.00	16.3
520—549.99	535	1	1.5	520.00	3.0	1	2.4	520.00	4.2
550—579.99	565					1	2.4	550.00	4.5
580—609.99	595								
610—639.99	625	1	1.5	616.00	3.5				
Total		66	100	17,416.48	100	42	100	12,299.40	100
		M=263.89				M=292.84			
		Mo—not clearly discernible				Mo=242.11			

TABLE XVIII
PRICE OF COCOON PER PICUL

Price (in taels)	Mid- value	1931		1932	
		No. of Filatures	Percent- age	No. of Filatures	Percent- age
52.50—59.99	56.25			2	6.7
60.00—67.49	63.75			10	33.3
67.50—74.99	71.25			8	26.7
75.00—82.49	78.75			10	33.3
82.50—89.99	86.25				
90.00—97.49	93.75				
97.50—104.99	101.25				
105.00—112.49	108.75	1	1.6		
112.50—119.99	116.25	2	3.1		
120.00—127.49	123.75	5	7.8		
127.50—134.99	131.25	2	3.1		
135.00—142.49	138.75	9	14.0		
142.50—149.99	146.25	1	1.6		
150.00—157.49	153.75	12	18.8		
157.50—164.99	161.25	9	14.1		
165.00—172.49	168.75	10	15.6		
172.50—179.99	176.25	4	6.2		
180.00—187.49	183.75	5	7.8		
187.50—194.99	191.25	1	1.6		
195.00—202.49	198.75	2	3.1		
202.50—209.99	206.25				
210.00—217.49	213.75				
217.50—224.99	221.25	1	1.6		
Total		64	100.0	30	100.0
		M=155.65		M=68.32	
		Mo=154.91		Mo—not clearly discernible	

purchasing is more often done in Shanghai, to which place the cocoon houses ship their products for sale at their own risk. On arrival at this port the cocoons are generally stored in warehouses, and samples are sent out through brokers to the various filatures. The commission charge of the latter is one tael per picul. Storage and insurance charges, which amount to approximately two taels per picul per month, are borne by the cocoon houses before and by the filatures after the transaction. Payment for the goods is made directly by the filature to the representative of the cocoon house, with ten-day "native orders," which are in the nature of promissory notes payable through the native banks. Tables XVII and XVIII show the quantity of cocoons required every month at the time of our investigation and the price per picul.

CHAPTER VI

PRODUCTION OF SILK

(i) *The Productive Capacity*

The manufacturing process at the filature begins with the dry cocoons. As the principal mechanical equipment of the silk filature is the reeling basin, so the quantity of production depends much on the number of reels. Two other factors which affect production are the kind of cocoons used and silk produced. When fresh cocoons have just arrived on the market, the gum in them is more easily dissolved in water even after they have gone through the regular drying process at the cocoon ovens, it takes less time to draw the silk out and reel it, and a larger quantity is produced at each reeling basin. On the other hand, cocoons that have been stored for a long time become too dry and hard, and from them less silk can be produced every day. The difference is often as much as ten per cent. As the filatures depend for their raw material mainly on the spring cocoon crop, the cocoons used in the later months have usually been in storage for a long time, and thus production is for most of the time affected by the dryness of the cocoons.

With regard to the quality of the silk produced, which is generally measured in terms of deniers, more can be produced of the coarser grades in the same period of time than of the finer ones. The following figures are the estimates of an expert in terms of one reel working twelve hours:—⁴⁵

9-11 denier	9 odd ounces (Chinese weight)
13-15 "	10 " "
15-20 "	11 " "
20 " up	13 " "
dupion silk	1 catty "

In our questionnaire there is one item dealing with the monthly productive capacity of the whole plant with respect to each kind of commodity produced. In the case of silk filatures, since the principal product is raw silk, the answers supplied by all the filatures are in

⁴⁵T. S. Miao, "Shanghai Silk Industry", *Foreign Trade Guide*, Vol. I. No. 3.

terms of this product. As one filature often produces silk of different deniers, and as the efficiency of the reeling machine and of the laborers differ also, the actual variation in the productive capacity is greater than is indicated by the estimates mentioned in the last paragraph. In the two following tables we give the monthly productive capacity per filature and per reel. The general practice with most filatures is to work 28 days in the month and 11 hours in the day, but there are some variations. Tables XIX and XX show that the mean monthly productive capacity per filature was 4,733 catties (=47.33 piculs) last year and 4,730 catties this year, and the mode 4,712 catties and 3,868 catties respectively. With regard to the monthly productive capacity per reel there were two exceptional cases last year that affected both the mean and the mode, which were 18.30

TABLE XIX

MONTHLY PRODUCTIVE CAPACITY

Productive Capacity (piculs)	Mid-value	1931				1932			
		No. of Filatures	Percentage	Capacity	Percentage	No. of Filatures	Percentage	Capacity	Percentage
20—24.9	22.5	2	3.0	43.00	1.4				
25—29.9	27.5	4	6.1	112.50	3.6	1	2.4	27.0	1.4
30—34.9	32.5	9	13.7	278.60	8.9	4	9.5	125.8	6.3
35—39.9	37.5	8	12.1	292.86	9.4	11	26.2	408.9	20.6
40—44.9	42.5	7	10.6	280.00	9.0	9	21.4	368.0	18.5
45—49.9	47.5	13	19.7	593.30	19.0	5	11.9	225.0	11.3
50—54.9	52.5	5	7.6	258.00	8.3	3	7.1	154.0	7.8
55—59.9	57.5	6	9.1	337.70	10.8	2	4.8	111.0	5.6
60—64.9	62.5	3	4.6	180.00	5.8	1	2.4	60.0	3.0
65—69.9	67.5								
70—74.9	72.5	2	3.0	142.00	4.5	1	2.4	73.0	3.7
75—79.9	77.5	2	3.0	153.75	4.9				
80—84.9	82.5	1	1.5	80.00	2.5	2	4.8	164.0	8.3
85—89.9	87.5	2	3.0	172.36	5.5	2	4.7	171.8	8.6
90—94.9	92.5	1	1.5	90.00	2.9				
95—99.9	97.5					1	2.4	98.0	4.9
100—104.9	102.5								
105—109.9	107.5								
110—114.9	112.5	1	1.5	110.00	3.5				
Total		66	100.0	3,124.07	100.0	42	100.0	1,986.5	100.0
			M=47.33				M=47.30		
			Mo=47.12				Mo=38.68		

MONTHLY PRODUCTIVE CAPACITY PER REEL

TABLE XX

Productive Capacity (piculs)	Mid-value	1931		1932	
		No. of Filatures	Percent-age	No. of Filatures	Percent age
.13—.139	.135	5	7.6		
.14—.149	.145	4	6.1		
.15—.159	.155	2	3.0	1	2.4
.16—.169	.165	5	7.6	4	9.5
.17—.179	.175	5	7.6	8	19.0
.18—.189	.185	13	19.7	8	19.1
.19—.199	.195	16	24.2	16	38.1
.20—.209	.205	4	6.1	1	2.4
.21—.219	.215	5	7.6	4	9.5
.22—.229	.225	2	3.0		
.23—.239	.235	3	4.5		
.24—.249	.245				
.25—.259	.255				
.26—.269	.265				
.27—.279	.275	1	1.5		
.28—.289	.285				
.29—.299	.295	1	1.5		
Total		66	100.0	42	100.0
		M=.1830		M=.1826	
		Mo=.1933		Mo=.1924	

and 19.33 catties respectively for last year and 18.26 and 19.24 catties for this year. As there are 16 ounces per catty, reducing the monthly to a daily figure on the prevalent basis of 28 days and 11 hours, we find the means and modes amount to 10.46 (1931 mean), 11.04 (1931 mode), 10.43 (1932 mean) and 10.99 (1932 mode) ounces respectively. They are not far from the estimates of the expert.

(ii) *Actual Production*

In addition to the monthly productive capacity, we have also collected data on actual production during the previous year from the filatures covered in our surveys of 1931 and 1932. In other words,

we have tried to obtain statistical figures showing the actual production in 1930 and 1931, although in the latter case, because most of the filatures were reorganized in 1932, only a very few filatures were able to supply us with 1931 production figures, and they are too few to be presented in the following tables. In order to make our data comparable with those of 1929, which were collected by the Shanghai Bureau of Inspection and Testing of Commercial Commodities and presented in the form of a frequency distribution with the class limits at 0.1-100, 100.1-200, etc., we are obliged to adopt the same limits in presenting our own data. Additional figures are taken from *The Industries of Shanghai*, in which average production figures for three years down to 1929 are given. Although they are slightly different in nature from the data for 1929 and 1930, they are nevertheless included here for the sake of comparison. The actual 1930 production of the 64 filatures covered in the 1931 survey is 22,770 piculs.

As actual production by filature is not easily comparable, the figures are reduced to production per month per reel in Table XXII. This not only facilitates comparison between filatures, but also with the monthly productive capacity per reel as given in Table XX. As is to be expected, the actual production is usually lower than the productive capacity, although in a number of cases they were running up to full capacity of so many days per month and so many hours per day as specified in their replies. On the following pages are the tables on actual production.

Since the productive capacity figures as supplied by the filatures do not represent full capacity when operated 30 days per month and 24 hours per day, we have reduced all such figures to the basis of 30 days and 24 hours and call it "maximum productive capacity." Further comparison is made for each filature between such "maximum capacity" and the actual quantity produced during the previous year. Because many filatures were operated only a few months in the year, and because very few were operated more than 11 hours a day, the highest percentage as shown in Table XXIII is below 50 and the lowest only 5. The latter is an exceptional case where the one filature under consideration was operated less than a month in the year. However, many of them were operated at less than 20 per cent of their capacity, and the mean is 25.89 per cent in 1931 and 27.67 in 1932. The mode, however, for the filatures covered by our 1931 survey

FIG. 4. QUANTITY OF SILK PRODUCED

上海絲廠產額次數分配圖

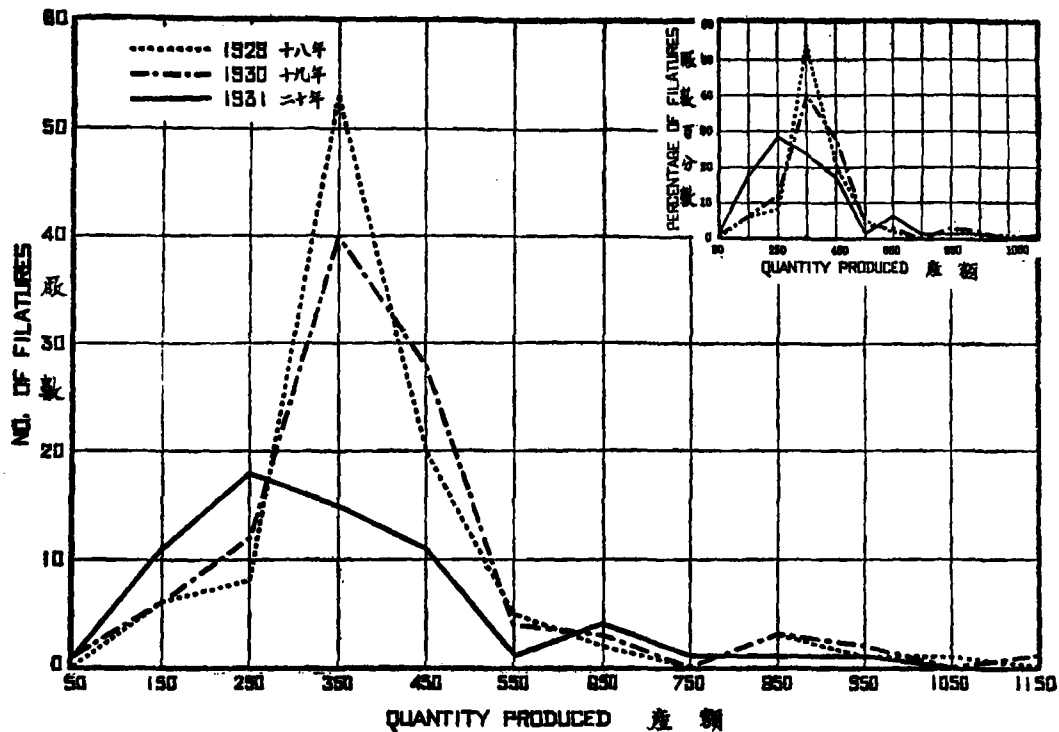


TABLE XXI
ACTUAL PRODUCTION IN THE PRECEDING YEAR

Quantity* (piculs)	Mid-value	1929 Survey				1930 Survey				1931 Survey			
		No. of** Filatures	Percent- age	Actual Quantity	Percent- age	No. of Filatures	Percent- age	Actual Quantity	Percent- age	No. of Filatures	Percent- age	Actual Quantity	Percent- age
1— 100.9	50					1	1	100	.2	1	1.5	72	0.3
101— 200.9	150	6	6.1	1,085	2.7	6	6	1,110	2.6	11	17.2	1,824	8.0
201— 300.9	250	8	8.1	2,186	5.4	12	12	3,388	8.1	18	28.1	4,616	20.3
301— 400.9	350	53	53.5	18,928	47.1	40	40	14,556	34.7	15	23.4	5,468	24.0
401— 500.9	450	20	20.2	9,197	22.9	28	28	12,665	30.2	11	17.2	5,140	22.6
501— 600.9	550	5	5.1	2,714	6.7	4	4	2,350	5.6	1	1.6	550	2.4
601— 700.9	650	2	2.0	1,400	3.5	3	3	2,100	5.0	4	6.2	2,515	11.1
701— 800.9	750									1	1.6	800	3.5
801— 900.9	850	3	3.0	2,700	6.7	3	3	2,570	6.1	1	1.6	850	3.7
901—1000.9	950	1	1.0	960	2.4	2	2	1,960	4.7	1	1.6	935	4.1
1001—1100.9	1050	1	1.0	1,050	2.6								
1101—1200.9	1150					1	1	1,200	2.8				
Total		99	100.0	40,220	100.0	100.0	100.0	41,999	100.0	64	100.0	22,770	100.0
		M=406.26				M=419.99				M=355.78			
		Mo=365.10				Mo=337.00				Mo=269.42			

*The class limits are so fixed because the 1930 data as published in the *Foreign Trade Guide* are given in that form only.

**The quantity produced as given in this survey of the Shanghai Bureau of Social Affairs represents in some cases the average of 1926, 1927 & 1928, in others the average of 1927 and 1928, in others the quantity of 1928 and in still others estimates only.

TABLE XXII

ACTUAL PRODUCTION PER REEL PER MONTH

Production (piculs)	Mid-value	1931		1932	
		No. of Filatures	Percentage	No. of Filatures	Percentage
.09—.099	0.095	1	1.6		
.10—.109	0.105	4	6.3	1	2.9
.11—.119	0.115	4	6.3	1	2.9
.12—.129	0.125	2	3.2		
.13—.139	0.135	7	11.1	1	2.9
.14—.149	0.145	4	6.4		
.15—.159	0.155	7	11.1	2	5.9
.16—.169	0.165	8	12.7	6	17.7
.17—.179	0.175	9	14.3	5	14.7
.18—.189	0.185	6	9.5	8	23.5
.19—.199	0.195	6	9.5	6	17.7
.20—.209	0.205	1	1.6	1	3.0
.21—.219	0.215	3	4.8	2	5.9
.22—.229	0.225				
.23—.239	0.235				
.24—.249	0.245	1	1.6	1	2.9
Total		63	100.0	34	100.0
		M=.1554		M=.1732	
		Mo=.1744		Mo=.1839	

is 30.90 per cent, which shows how irregular the frequency curve is. For those surveyed in 1932 there is not even a discernible mode.

It would be possible to estimate from these percentages the quantity of raw silk that could be produced in Shanghai were all the filatures fully operated, but that would be no better than idle speculation in these years of serious depression of the industry. The maximum capacity of the filatures surveyed by us does not represent the maximum capacity of all Shanghai filatures, some of which were closed down during these years, others dismantled and still others destroyed by Japanese bombs and gunfire. Those in the last category, if entirely destroyed, would be out of question, but some of them were only partially so, and might be repaired and reopened if the prospects of the industry should improve. The equipment of the dismantled ones could in some cases also be set up elsewhere in case of need, and those temporarily closed down can certainly be reopened at a moment's notice. Hence it would be simpler yet more to the

point, if we wish to estimate the possible maximum producing capacity of the Shanghai filatures, by multiplying the total number of reels that are not destroyed or dismantled (many of the dismantled plants, like the very old filature Lunhwa, have been removed to interior cities and installed there, thus of no more avail to Shanghai) by the average monthly productive capacity converted to the basis of 12 months in the year, 30 days in the month and 24 hours in the day, or simply doubled to represent roughly a night shift of the same length as the day shift. By assuming the total number of reels now existing according to the best of our knowledge to be 21,000 in round numbers, and using the average monthly productive capacity of 47.30 catties per reel, we arrive at the approximate maximum capacity for the present time of 19,866 piculs a month, or 238,392 piculs a year. Below is a table showing the percentage of actual production to maximum producing capacity for the filatures covered by our two surveys.

TABLE XXIII
PERCENTAGE OF ACTUAL TO FULL TIME PRODUCTION

Percent- age	Mid- value	1931		1932	
		No. of Filatures	Per Cent of Total	No. of Filatures	Per Cent of Total
4—5.9	5	1	1.5		
6—7.9	7				
8—9.9	9	1	1.6	1	4.3
10—11.9	11	4	6.2	1	4.3
12—13.9	13	3	4.7	1	4.4
14—15.9	15	2	3.1		
16—17.9	17	1	1.6	1	4.4
18—19.9	19	3	4.7	2	8.7
20—21.9	21	8	12.5	2	8.7
22—23.9	23	1	1.6		
24—25.9	25	3	4.7	3	13.1
26—27.9	27	6	9.4		
28—29.9	29	3	4.7	1	4.4
30—31.9	31	9	14.1	3	13.1
32—33.9	33	9	14.1	2	8.7
34—35.9	35	6	9.4	2	8.7
36—37.9	37	2	3.1		
38—39.9	39			1	4.3
40—41.9	41	1	1.5	1	4.3
42—43.9	43	1	1.5	1	4.3
44—45.9	45			1	4.3
Total		64	100.0	23	100.0
			M=25.89	M=27.67	
			Mo=30.90	Mo—not discernible	

Table XXIV shows the price per picul of silk as reported by the individual filatures. In 1932, as most filatures were operated for the banks, the filature people could not supply any information about the price of their product. Hence the very small number of filatures in the table.

TABLE XXIV
PRICE OF SILK AS REPORTED BY INDIVIDUAL FILATURES

Price (taels per picul)	Mid- value	1931		1932*	
		No. of Filatures	Percent- age	No. of Filatures	Percent- age
420—449	435			1	16.67
450—479	465			1	16.67
480—509	495			4	66.66
510—539	525				
540—569	555				
570—599	585				
600—629	615				
630—659	645				
660—689	675				
690—719	705				
720—749	735	2	3.2		
750—779	765				
780—809	795	4	6.3		
810—839	825	3	4.8		
840—869	855	4	6.3		
870—899	885	6	9.5		
900—929	915	13	20.6		
930—959	945	8	12.7		
960—989	975	6	9.5		
990—1019	1005	11	17.5		
1020—1049	1035	2	3.2		
1050—1079	1065				
1080—1109	1095	3	4.8		
1110—1139	1125				
1140—1169	1155				
1170—1199	1185				
1200—1229	1215	1	1.6		
1230—1259	1245				
1260—1289	1275				
Total		63	100.0	6	100.0
		M=930.20		M=472.50	
		Mo=917.50			

*The number of filatures in 1932 that sold their own product was very small, hence the small number that reported on silk prices. These figures are included in the table to show the great variation in price in these two years.

TABLE XXIVa

VALUE OF SILK PRODUCED BY THE SHANGHAI SILK FILATURES
DURING THE 1930 SEASON*

Value (taels)	Mid- point	No. of Filatures	Percent- age	Value of Silk Produced	Percent- age
50,000— 99,999	75,000	1	1.6	64,000.00	3
100,000— 149,999	125,000	4	6.5	486,260.00	2.3
150,000— 199,999	175,000	7	11.3	1,176,800.00	5.6
200,000— 249,999	225,000	9	14.5	2,047,550.00	9.8
250,000— 299,999	275,000	10	16.1	2,637,600.00	12.6
300,000— 349,999	325,000	5	8.1	1,232,000.00	5.9
350,000— 399,999	375,000	8	12.9	3,276,750.00	15.6
400,000— 449,999	425,000	4	6.5	1,624,300.00	7.7
450,000— 499,999	475,000	5	8.1	2,364,941.60	11.3
500,000— 549,999	525,000	2	3.2	1,074,000.00	5.1
550,000— 599,999	575,000	2	3.2	1,145,600.00	5.5
600,000— 649,999	625,000	2	3.2	1,225,700.00	5.8
650,000— 699,999	675,000				
700,000— 749,999	725,000	1	1.6	700,000.00	3.3
750,000— 799,999	775,000				
800,000— 849,999	825,000				
850,000— 899,999	875,000	1	1.6	897,600.00	4.3
900,000— 949,999	925,000				
950,000— 999,999	975,000				
1,000,000—1,049,999	1,025,000	1	1.6	1,020,000.00	4.9
Total		62	100.0	20,973,101.00	100.0
				M=338,275.83	
				Mo=272,413.93	

*These data were supplied by 62 of the 66 filatures during the 1931 survey of this Institute.

(iii) *The By-Products*

A very important item in the receipts of the filatures is the value received for cocoon and silk waste. Through the sorting process a quantity of cocoons unfit for reeling are picked out and put aside, and through the peeling process the outer layer of the cocoons is also discarded. From the reeling basin come also many kinds of discards, which, like the waste cocoon, are sold to certain special kinds of silk mills and bring in a substantial sum to the filatures. There are sixteen kinds of these things which will be described below, and constitute the *hsia-chiao* (下脚) or refuse of the filatures. Not all of them are by-products of the filature, since the cocoon refuse

does not go through the manufacturing process at all, but they are all listed here because the silk people treat them alike, and alike they bring some income to the filatures.

(A) Cocoon refuse:—

(1) Dupion cocoons. They are cocoons made by two silkworms in one, and the silk fibre is too heavy for reeling ordinary raw silk. However, there are special dupion filatures which reel silk from these cocoons.

(2) *Okow* (蛾口), or cocoons bitten through by the caterpillar.

(3) *Lanchien* (爛繭), or cocoons that are half spoiled.

(4) *Yintow* (印頭), or cocoons that are spoiled at one end only.

(5) *Chwantow* (穿頭), or cocoons that are bitten through by flies which got into the cocoons at the time of their spinning, in the form of larvae.

(6) *Hwangpan* (黃斑), or cocoons with yellow spots on them.

(7) *Suihwang* (水黃), or cocoons that are of a light yellow color throughout.

(8) *Hwanglu* (黃綠), or cocoons of a yellowish green color.

(9) *Popi* (薄皮), or cocoons formed by half starved silkworms, too thin and too poor for ordinary use.

(10) *Chienyi* (繭衣), or outer cover of cocoons.

(B) Silk refuse:—

(11) *Tangchien* (湯繭), or cocoons already boiled but from which the silk cannot be reeled because no end of the silk thread can be found.

(12) *Ssutow-tangchien* (絲頭湯繭), or cocoons which have been partly reeled and then discarded because the silk thread is broken and no new end can be found.

(13) *Tatow* (滯頭—it should in fact be pronounced *tsitow*, but the Shanghai silk men call it *tatow*), or the small quantity of silk thread that sticks to the dead worm in the center of the cocoon.

(14) *Chientu* (繭吐), or short silk threads broken during the reeling process. They are often as long as 7 or 8 feet, and are therefore also known as *changtu* (長吐) or "long refuse."

(15) *Chintu* (經吐), or broken silk threads discarded at the time of re-reeling.

(16) *Chano* (蠶蛾), or the dead worm.

The dupion cocoons are sold to the dupion filatures. The colored cocoons are used by some filatures for reeling yellow silk, but sold by others to those that use them. All the other refuse except item No. 16 is either sold to the local silk spinning mills which clean, bleach and break up the fibre into small fragments and then spin them into yarn like cotton, or exported abroad, presumably for the same purpose. Some of the broken cocoons are sold to the silk wadding firms which make them into wadding for lining Chinese clothing or quilts. As to the dead worms, they are inseparable from the *tatow*, and constitute only one by-product, so far as the filatures are concerned. However, when sold to the special class of workshops known as *tatow factories*, they are there separated from the broken silk thread and resold to farmers for feeding ducks. Formerly one picul of *tatow*, when detached from the dead worms, would bring in a few tens of taels, and the *chientu* much more. From certain sources we have obtained the following information about the prices of some by-products at the beginning of the last and the present silk season:—

Price per picul of	1931 season	1932 season
Changtu (silk refuse)	150-160 Tls.	60-80 Tls.
Dupion cocoons	80 "	30 "
Rotten cocoons	40 "	15-16 "
Cocoon covers of Shaohing	180-150 "	60 "

On the whole, it was formerly estimated that, in the production of one picul of raw silk, the by-products and refuse together would bring in about 200 taels, but their value has also dropped more than 50 per cent. A filature visited this year informed us that for every picul of silk produced, 48 catties of cocoon covers (*chieneni*) and 25-30 catties of silk refuse (*changtu*) were obtained. As the former fetched only 60 taels a picul instead of 110 (as was the case last year) and the latter 90 taels, these two "by-products" together brought to the filature the sum of about 54 taels per picul of silk produced. By adding the value of other "by-products" the total was brought up to 78 taels. Six of the filatures surveyed last year supplied detailed data about the value of their by-products, and together they amounted to 266,246 taels, as against 2,192,600 taels representing the total value of their silk production. Hence the former constituted slightly above 12 per cent of the latter. In the individual cases, the percentage varied from a few to 20 per cent.

CHAPTER VII

MOTIVE POWER

(i) *The Steam Engine*

The motive power in all Shanghai silk filatures is steam. The steam engine supplies not only power but also hot water for boiling the cocoons. In some filatures an extra steam engine may be devoted to the pumping of water; in others this work may be done by petrol engines or electric generators. Unlike the silk weaving mills, electricity is never used to supply power to the manufacturing operations in the filatures. However, there are almost always electric generators in the latter, but they are always worked by the steam engines to generate electricity for lighting the plant. After the manufacturing work is over for the day, usually at about six or seven o'clock in the afternoon, the offices and bed rooms would be lighted with rented electric current. Otherwise, no rented current is used in the filatures. As the generators are worked by the steam engines, the amount of their horsepower should not be included in the total power supply, as it would mean duplication of count. Hence the totals we give in the tables about power are the totals of the steam and petrol (when there are such) engines only. Because of the prevalent usage in the Shanghai factories of calling both electric motors and meters by the same name "mata," it took us a good deal of trouble in differentiating the one from the other.

Although the engine room supplies the motive power to the whole filature, it is usually not considered by the firms as one of their departments. This is because the room is generally "farmed" out to a man called *laokwei* (老鬼), or the "old devil," who undertakes to supply power enough to run all the reels of the filature at a fixed sum a month. He is generally something of a skilled mechanic who knows how to handle the steam engine, including the cost of running it and of keeping it in repairs. The *laokwei* engages his own assistants and buys all the necessary supplies except coal, while the firm gives him only a fixed sum. For the supply of motive power to each reel, the sum allowed is usually \$0.55 silver a month. Some filatures have also electric motors, but they are used for pumping water or supplying

the motive power when the steam engine is being repaired. The regular type of prime mover in the silk filatures is always the steam engine. As the engine room is thus "farmed out," the workers there will not be included in the following discussion of wage rates, unless specifically mentioned.

(ii) *Tenure of the Mechanics*

Another peculiarity about the engine room is that the *laokwei* is seldom changed when the filature changes hands. The new firm usually farms out the engine room to the same man who has probably been there since the plant was first built. He knows the particular engine as well as a rider knows his favorite horse, how well it can work, and how it is to be kept in repairs. For major repairs, of course, the owner of the plant will be responsible, but all minor work is done by the *laokwei* without extra charge to the operating firm. As this man has been with the filature much longer than all other laborers, or even the managers, he is therefore called the "old devil," a nickname which does not necessarily mean anything bad. In some filatures where more than one plant is supplied with power from the same engine room, we have the same set of workmen for more than one plant, and for statistical purposes we are obliged to divide the number among the constituent plants. Hence the number of male workers in the filatures sometimes includes a fraction of a man. Sometimes the *laokwei* farms out engine rooms in different localities, and at each plant an assistant is placed in charge of the operation, who is called the *erkwei* (二鬼) or "No. 2 devil." Under the *laokwei* and *erkwei* are usually a brass-smith, a carpenter, an attendant of the water pump, a man to filter the water through the sand bath, and a few to look after the engine itself. For his own remuneration, the *laokwei* keeps whatever is left from the fixed sum over and above the wages of his assistants and the cost of the supplies. In addition he also receives a commission of 30 to 40 cents per ton of coal bought by the filature, and together with his men share the "silk caterpillar" bonus with the rest of the men.

On account of the closing down this year of many filatures that were in operation last year, the reopening of some not then in operation, and the utilization of portions of filatures instead of

the whole, the distribution of horse power of the prime movers also differs much from that in last year. Figures for these two years are given in Table XXV. In the next table the number of reels operated by one horse-power of steam is shown, varying from 2 to 40 reels.

TABLE XXV
NUMBER OF HORSEPOWER PER FILATURE

Horsepower	Mid-value	1931				1932			
		No. of Filatures	Percent-age	No. of Horse-power	Percent-age	No. of Filatures	Percent-age	No. of Horse-power	Percent-age
5— 9.99	7.50	16	24.2	118	8.9	6	13.3	45	5.6
10— 14.99	12.50	16	24.2	200	15.0	11	24.4	128	15.9
15— 19.99	17.50	10	15.2	163	12.2	13	28.9	212	26.3
20— 24.99	22.50	9	13.6	198	14.9	8	17.8	178	22.1
25— 29.99	27.50	3	4.6	77	5.8	2	4.5	51	6.3
30— 34.99	32.50	3	4.6	96	7.2	1	2.2	32	4.0
35— 39.99	37.50	2	3.0	72	5.4	1	2.2	36	4.4
40— 44.99	42.50	3	4.6	121	9.1	3	6.7	124	15.4
45— 49.99	47.50	2	3.0	94	7.1				
50— 54.99	52.50								
55— 59.99	57.50								
60— 64.99	62.50								
65— 69.99	67.50								
70— 74.99	72.50	1	1.5	72	5.4				
75— 79.99	77.50								
80— 84.99	82.50								
85— 89.99	87.50								
90— 94.99	92.50								
95— 99.99	97.50								
100—104.99	102.50								
105—109.99	107.50								
110—114.99	112.50								
115—119.99	117.50								
120—124.99	122.50	1	1.5	120	9.0				
Total		66	100.0	1,331	100.0	45	100.0	806	100.0
		M=20.17				M=17.91			
		Mo=10				Mo=16.85			

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TABLE XXVI

NUMBER OF REELS OPERATED BY ONE HORSEPOWER

No. of Reels	Mid-value	1931		1932	
		No. of Filatures	Percentage	No. of Filatures	Percentage
2— 3.99	3	1	1.5		
4— 5.99	5	3	4.6	2	4.5
6— 7.99	7	3	4.6	1	2.2
8— 9.99	9	6	9.1	3	6.7
10—11.99	11	1	1.5	4	8.9
12—13.99	13	7	10.6	2	4.4
14—15.99	15	9	13.6	10	22.2
16—17.99	17	14	21.2	8	17.8
18—19.99	19	1	1.5	2	4.5
20—21.99	21	6	9.1	4	8.9
22—23.99	23	1	1.5		
24—25.99	25	1	1.5		
26—27.99	27	6	9.1	5	11.1
28—29.99	29	1	1.5	2	4.4
30—31.99	31			1	2.2
32—33.99	33	3	4.6	1	2.2
34—35.99	35				
36—37.99	37	2	3.0		
38—39.99	39	1	1.5		
Total		66	100.0	45	100.0
			M=17.50		M=17.15
			Mo=16.61		Mo=15.25

It is widely practised among the filatures to arrange with coal merchants to supply enough coal to their engine rooms at so much per reel per day. According to our investigation, the quantity of coal required for the operation of one reel is about 40 catties a day, which works out at 40 reels per ton of coal per diem. Thus the calculation of coal consumption is not based on the number of horsepower of the engines. In terms of money, the sum paid by the filatures to the coal merchants for the supply of fuel is approximately three mace (one-tenth of a tael) per reel per day. In one particular case investigated this year, the exact figure is 0.315 tael.

CHAPTER VIII

OFFICERS AND WORKERS

(i) *The Various Departments*

Since the firms operating the silk filatures are generally in the nature of partnerships, one of the partners usually serves as the manager of the firm. Most of them have no separate sales office, and hence the office of the firm is located at the same place as the filature, and the manager of the firm is in charge of the manufacturing as well as commercial activities of the firm. In the terminology of the trade, the establishment is divided into three *changfang*, or "account rooms," and they are distinguished into the *neichangfang* or "inside account room," *waichangfang* or "outside account room," and *kung-changfang* or "industrial account room." The first handles all money and matters relating to money, including purchases and sales. The second supervises the stocks and calculates the wages, the latter being necessary on account of the wage system in the industry to be described later. All matters directly relating to the manufacturing process, including the supervision of the laborers, are taken care of by the third department, the "industrial account room." While the manager controls all three departments, there is a separate head or "accountant" in each of them, and sometimes assistant heads.

The factory is usually divided into five "rooms" or manufacturing departments: (1) cocoon peeling, (2) cocoon sorting, (3) silk reeling, (4) silk finishing and re-reeling, and (5) waste preparing. In each of the first as well as the last two rooms there is a boss to supervise the work, with the help of a few assistants and apprentices. There are no apprentices in this industry learning to become workers, but all so-called apprentices are young persons learning to be foremen, supervisors or office clerks. In the third "room," which is the principal part of the filature, since the main work of the filature consists of reeling silk, the boss is known as "*chungche*," pronounced in the Shanghai dialect *tsongtso* (總車), meaning the boss of the reels.

Under him there are many assistant bosses called *kwanche* or "controllers of reels," each of whom generally controls two rows of from 24 to 32 reels each. As there are approximately one and a half workers to the reel, this means that an assistant boss supervises the work of from 36 to 48 workers.

The majority of the workers in the filatures are women and girls who attend to the manufacturing of the silk. The men either work in the engine room or do the weighing of the cocoons, packing of the silk, transporting of the cocoons and silk from place to place, delivering of goods to customers, lubricating of the machinery, cleaning up of the rooms—in short, all the heavy work which the women cannot do. Most foremen, however, are male persons, although females sometimes fill the position of *kwanche* and other kinds of assistant bosses. All those in the "inside and outside account rooms," who are either officers or clerks or apprentices, are also men. It is a peculiar custom of the silk filatures to call all the men "officers," and then distinguish those who do manual work (which really means laborers and janitors) as "military officers," while the foremen and clerks and the real officers are known as "civil officers." Also the "civil" and the "military officers" are treated in the same way, both being paid by the month, supplied with food and lodging by the filature, and given a fixed "caterpillar" bonus of 45 cents per dollar of their salary or wages to be explained in detail later. Even during meals they eat at the same table. Thus there is a good deal of democracy in the silk filatures.

On account of this peculiar custom of calling all men in the filatures "officers," many of the schedules filled last year at first listed no male workers at all. As this aroused our suspicion, we sent the investigators to the filatures again, only to be informed of certain figures which really represented the number of workmen in the engine room. The packers, transporters, etc., being called *chutien* or *shroffs*, were still left out, because the names seemed to indicate that they were salesmen. It was only after a special investigation was made of the personnel organization of the filatures that corrections were made by deducting the number of "military officers" from the total number of officers and putting it under male laborers. Some of the filatures

were closed before we had time to visit them again to find out the exact number of their "military officers." In such cases we are obliged to estimate their proportion in the total on the basis outlined in the following paragraph. Fortunately, in spite of the farming system, the filatures consider the workers in the engine room as "military officers" and thus their number is not omitted from the total number of officers.

(ii) The Number of Workers

Of the total of 66 filatures covered by last year's survey, 51 supplied separate figures for male officers and male workers. We might find out the proportion of the two groups of men from the figures so separately furnished, and estimate the male officers and male workers of the remaining filatures on the basis of this proportion. However, this is not done in the present case, as we have reasons to doubt that some of the 51 filatures did not separate their officers and men properly according to our standards. Instead, only 25 filatures are selected which were covered by the special investigation, and which we know for certain to have given us the correct figures. The number of male workers in these 25 filatures was 597 and of male officers 672. The ratio was therefore 1:1.126. In the survey of 1932, with our past experience as a guide, we were able to secure separate figures for all the 46 filatures covered except four, and found that they had among them 1,013 male workers and 1,027 male officers, resulting in a ratio of 1:1.014. The two ratios are not far apart, but as we need one as the basis of estimate for the figures of last year, we adopt the former ratio. On that basis we arrive at 890 as the estimated number of male workers in the remaining 41 filatures, and 1,004 as that of male officers. The totals of these two groups of men for all filatures surveyed last year should therefore be 1,487 and 1,676 respectively. It may be mentioned in this connection that judged by this basis of estimation, at least 45 filatures reported correctly last year, although we were only sure of the figures in the 25 specified filatures.

Of the female workers, the large majority work in the reeling room. Here they are of three groups—the regular reelers of whom there must be one to each reel, the substitute reelers who take the place of the former when some of them are on leave or leave their

place for short intervals, and the basin workers who are young girls attending the basins in which the cocoons are boiled or kept in a warm condition. As there is usually one basin to every two reels, the number of the basin workers is approximately half that of the reels or of the regular reelers, which amounts to the same thing. But this is not absolutely invariable, as may be seen from the table following some paragraphs below. Also, although the majority of child workers in the filatures are basin workers, some of them work as substitute reelers or in other departments. Hence the number of child workers as shown on our schedules is often larger than the number of basin workers in the same filatures as given in the special table showing all kinds of workers separately.

(iii) The Piece Rate Workers

Although the reeling department is the most important one in a silk filature, the manufacturing process really begins in the cocoon peeling room. Here all the women are piece rate workers, being paid at so much per basket of cocoons peeled. Each of them is given a small account book in the customary form of a Chinese folder, and every day the quantity of cocoons peeled by the particular peeler is entered in her account. At the end of every half month, the peeler is paid according to the amount of work she has done so far and which has been entered in her book. Oftentimes a peeler brings her sister or daughter to the filature to help do the work and earn more money for the family, in which case the filature keeps an account only with the mother or elder sister. There are also child workers who work by themselves. The filature management is generally so little interested in these piece rate workers that it does not keep track of their actual number. Excepting a few, most filatures confess that they know only the number of account heads opened with such workers, and from day to day there may be a few more or less. For the same reason they seldom keep records as to how many of them are adults and how many children. Of course the Institute might have its own investigators count the number in each filature, but that number would only represent the situation on the day of the investigation. As it was not possible for us to take a census of all Shanghai industries on the

same day, the result of the actual count would be no more accurate for any period of time than the figures supplied to us by the filatures.

Another factor that affects the number of cocoon peelers beyond the ordinary range of fluctuation is the nature of the cocoon itself. The outside peel of some kinds of cocoons is very thin, and they may be boiled and reeled without going through the preliminary process of peeling. When a filature gets a supply of such cocoons, it is unnecessary to have peelers. Later on the same filature may buy a quantity of cocoons of a different kind, and then it will begin to engage such workers. As this work requires no training, there are any number of women living in the neighborhood of the filatures who can do it. Whenever a filature needs them, it is only necessary to tell the regular women workers, e.g. the reelers, of the fact, and they will in turn tell their acquaintances to come to the filature and take up the work the next day. By so doing these peelers do not commit themselves to coming to the filature every day, but are free to come any day they like as long as there is peeling work to be done. The filature on its part is also not committed to keep the peelers for any definite length of time, but some or all of them may be discharged at a moment's notice. In the case of a firm running more than one filature, the cocoons are often peeled and sorted at one plant and reeled at a second, and there will then be no peelers nor sorters at the latter place.

(iv) Average Number of Workers Per 100 Reels

Last year we made a sample study of ten filatures and this year of twenty-two, in which the number of each kind of workers was separately ascertained. The sample should have been larger last year, in view of the larger number of filatures then in operation, but the general survey of all industries undertaken at that time allowed little time for more intensive work. In Table XXVIII the result of these studies is given. Two averages are worked out to show the average number of each class of workers per filature and per 100 reels. The latter average is perhaps more important, since the number of most workers in the filatures varies with the number of reels. If a sample

were taken of ten large filatures and another of ten small ones, the first average would show wide discrepancy between these two samples, but the latter would not.

So far as these two surveys are concerned, the averages per filature correspond quite closely except in the case of peelers and to a smaller extent the substitutes. The differences in the case of all other kinds of laborers do not exceed 10 per cent. As to the average numbers per 100 reels, the correspondence between the two samples is even greater, excepting also the peelers. The larger number of peelers last year is due to the smaller size of the sample, as the average for all filatures last year shown in Table XXVII agrees fairly well with the same for the samples as well as for all filatures of this year.

TABLE XXVII

OFFICERS AND WORKERS IN THE FILATURES*

Date	1931			1932		
No. of Filatures	66			45		
No. of Reels	17,238			12,046		
Total or Average	A	B	C	A	B	C
Male Officers	1,676	25.42	9.72	1,007	22.38	8.36
Female Officers	193	2.93	1.12	113	2.51	0.94
Female Workers						
Day Rate	24,830	376.21	144.04	16,456	365.69	136.61
Piece Rate	5,046	76.45	29.27	4,301	95.58	35.71
Child Workers	8,994	136.27	52.17	5,978	132.84	49.63
Male Workers	1,487	22.53	8.63	995	22.11	8.26
All Workers	40,357	611.46	234.11	27,730	616.22	230.21

NOTES: A. Original data. B. Average number per filature. C. Average number per 100 reels.

*The workers are classified according to the classification in our original schedule which was designed for application to all industries.

TABLE XXVIII

FILATURE WORKERS CLASSIFIED BY OCCUPATION

Date	1929			1931			1932		
No. of Filatures	107			10			22		
Total No. of Reels	24,906			2,574			5,472		
Total or Average	Total	Average		Total	Average		Total	Average	
		A	B		A	B		A	B
Reeling Dept:									
Reelers	24,906	232.8*	100.00	2,574	257.4	100.00	5,472	248.7	100.00
Substitutes	—	40.0	17.18	279	27.9	11.57	695	31.6	12.70
Basin workers	12,453	116.4*	50.00	1,300	130.0	50.51	2,760	125.4	50.44
Sorters	—	15.0	6.44	469	46.9	18.22	957	43.5	17.49
Peelers	—	30.0	12.89	1,155	115.5	44.87	1,897	86.2	34.67
Finishers	—	15.0	6.44	184	18.4	7.15	363	16.5	6.63
Waste-preparers	—	15.0	6.44	207	20.7	8.04	432	19.6	7.89
All women	—	464.2	199.39	6,168	616.8	240.36	12,576	571.5	229.82
Male workers	—	16.0	6.87	225	22.5	8.74	457	20.8	8.35
All workers	—	480.2	206.26	6,393	639.3	249.10	13,033	592.3	238.17
Male officers	—	(not given)		252	25.2	9.79	463	21.0	8.46
Female officers	—	"		33	3.3	1.28	35	1.6	0.64
All officers	—	"		285	28.5	11.07	498	22.6	9.10

NOTE: Average A represents the average number per filature, and Average B the average number per 100 reels.

*These figures are calculated from the totals for the 107 filatures, while the others are given as estimates on the basis of certain samples the size of which is not given.

In the "Wages and Hours of Labor of Greater Shanghai, 1929," the Shanghai Bureau of Social Affairs gave a list of 107 filatures then in operation and estimated the number of reelers and basin workers from the number of reels at the rate of one reeler and half a basin worker per reel. As the total number of reels was 24,906, the number of reelers was given at the same figure and that of basin workers at 12,453. For the other kinds of workers, the Bureau based its estimate on a sample study, the size of which is not mentioned in the report. Thus the average number of sorters per filature was given at 15, peelers 30, substitute reelers, 40, waste-preparers 15, finishers 15 and male workers 16. When compared with our figures, only the number of finishers corresponds with ours in 1932 within 10 per cent, while all other averages differ from ours by 20 per cent or more. The averages for sorters and peelers are only about one-third of our figures, and that for substitutes is one-third higher. By multiplying these averages by 107—the number of filatures in 1929—then dividing them by the total number of reels and multiplying the quotient by 100 again, we obtain the averages per 100 reels. These averages also differ very widely from ours. Although the difference might be due to the larger size of the Bureau's sample as compared with ours, this assumption is not likely to be true. In Table XXVII we give the totals and similar averages of male, female and child workers for all the filatures covered by our surveys of 1931 and 1932. While these give only the main groupings, the female workers paid by the piece are all peelers, and the male workers cover the same ground as the corresponding classification in Table XXVIII. As 66 and 45 filatures respectively are included in the former table, the numbers are probably as large as or larger than the sample taken by the Bureau, and yet the averages in that table correspond more to our averages in Table XXVIII than to those of the Bureau. Also the fact that the Bureau averages are all in round numbers suggests the possibility that they are approximate figures based on the estimates of the silk merchants themselves. These figures show how averages per filature do not form as good a basis for making estimates as averages per 100 reels.

As has already been made clear in another chapter of this study, these merchants have certain rough averages which they habitually use in making estimates, and our own investigation has shown that although some of them are quite close guesses, many such averages correspond neither to the arithmetic mean nor the mode of statistical data.

One of such estimates concerns the number of female workers per reel. It is generally estimated by the merchants that there is one reeler, and half a basin worker, per reel. As to the peelers, they think that each worker can supply $2\frac{1}{2}$ reels with cocoons. For every 200 reels, their estimate of the number of sorters is from 50 to 60, and of finishers and waste-preparers 20 each. From 3 to 4 substitute reelers are considered the usual number for each row of 26 to 28 reels. Calculating on this basis, we get the following numbers per 100 reels:—

Sorters	.. .. .	100
Basin workers	.. .. .	50
Peelers	.. .. .	40
Reelers	.. .. .	25- 30
Waste-preparers	.. .. .	10
Finishers	.. .. .	10
Substitute reelers	.. .. .	10- 16
Total	.. .. .	<u>245-256</u>

From our own sample study we reach the average of 240.36 in 1931 and 229.82 in 1932, and from all the filatures we covered in these two years, the averages are 225.48 and 221.95 respectively. They are both lower than the estimates of the silk merchants, but the discrepancies are not very large.

In Table XXIX all the workers—male as well as female—are grouped into frequency distributions by filatures, showing that each filature had on the average 611-616 workers in these two years, but the mode was only 538.89 in 1931 and 531.82 in 1932. When calculated on the basis of so many per reel, we find the mean to be 2.354 workers in 1931 and 2.310 in 1932, while the mode was 2.256 and 2.354 respectively. When we consider that in April, 1930, 107 filatures with 25,395 reels were operating, while in 1932 the numbers were 46 and 12,262 respectively (including one dupion filature), and if we assume that on the average 2.31 workers were thrown out of employment for every reel unoperated, we may perhaps conclude that, in the Shanghai silk reeling industry alone, unemployment due to the world depression affected 30,337 workers.

TABLE XXIX

NUMBER OF WORKERS IN SHANGHAI FILATURES

No. of Workers	Mid-value	1931				1932			
		No. of Filatures	Percent-age	No. of Workers	Percent-age	No. of Filatures	Percent-age	No. of Workers	Percent-age
300—399	350	5	7.6	1,800.5	4.5	4	8.9	1,432	5.2
400—499	450	17	25.8	7,768.0	19.3	11	24.4	5,088	18.3
500—599	550	21	31.8	11,489.5	28.5	15	33.3	8,043	29.0
600—699	650	12	18.2	7,658.0	19.0	5	11.1	3,055	11.0
700—799	750	2	3.0	1,478.0	3.6	2	4.5	1,569	5.7
800—899	850	1	1.5	800.0	2.0	1	2.2	868	3.1
900—999	950	4	6.1	3,760.5	9.3	3	6.7	2,908	10.5
1000—1099	1050					1	2.2	1,094	3.9
1100—1199	1150					2	4.5	2,209	8.0
1200—1299	1250	1	1.5	1,224.0	3.0				
1300—1399	1350	2	3.0	2,707.5	6.7				
1400—1499	1450					1	2.2	1,464	5.3
1500—1599	1550								
1600—1699	1650	1	1.5	1,671.0	4.1				
Total		66	100.0	40,357.0	100.0	45	100.0	27,730	100.0
		M=411.47				M=616.22			
		Mo=538.89				Mo=531.82			

TABLE XXX

NUMBER OF WORKERS PER REEL

No. of Workers	Mid-value	1931		1932	
		No. of Filatures	Percentage	No. of Filatures	Percentage
1.40—1.49	1.45	1	1.5		
1.50—1.59	1.55	1	1.5		
1.60—1.69	1.65			1	2.2
1.70—1.79	1.75	1	1.5	1	2.2
1.80—1.89	1.85	4	6.1	1	2.2
1.90—1.99	1.95	2	3.0		
2.00—2.09	2.05	4	6.1	3	6.7
2.10—2.19	2.15	4	6.1	6	13.3
2.20—2.29	2.25	16	24.2	5	11.1
2.30—2.39	2.35	4	6.1	13	28.9
2.40—2.49	2.45	6	9.1	7	15.6
2.50—2.59	2.55	8	12.1	6	13.4
2.60—2.69	2.65	6	9.1		
2.70—2.79	2.76	2	3.0	1	2.2
2.80—2.89	2.85			1	2.2
2.90—2.99	2.95	5	7.6		
3.00—3.09	3.05	1	1.5		
3.10—3.19	3.15	1	1.5		
Total		66	100.0	45	100.0
		M=2.354		M=2.310	
		Mo=2.256		Mo=2.354	

CHAPTER IX

WAGES

(i) Wages and Bonus

The wages of laborers in the silk filatures are fixed differently for different kinds of workers. The male workers are all paid by the month, in the same way as the officers, clerks and foremen are paid. In addition they are given free board and lodging, although some of those who live in the neighborhood may not take advantage of the latter privilege. As stated by those factories which supplied the information requested, the value of the food supplied was approximately \$6.00 a month, and lodging half a dollar a month.

An important addition to the wages of the male workers, as well as the salaries of the male officers, is what is known as the "caterpillar bonus." Last year it amounted to as much as 45 cents for every dollar of wages received, but this year, on account of the very bad depression in the industry, this bonus is abolished by all filatures except one. Unlike other bonuses, it was for many years fixed at a definite percentage of the wages, and owes its name to the extra income which the filatures receive from selling cocoon refuse and silk waste, described in detail in another chapter. Originally many kinds of such refuse and waste were thought to be valueless, and the male workers who were responsible for cleaning up the filatures were allowed to dispose of them in any way they liked. However, it was later found out that they could be sold for a handsome amount, and it was then arranged between the management and the workers that the proceeds of the sale should go to the proprietors, and the officers and laborers recompensed by a sum representing a fixed percentage of their salaries and wages. As the wages of the female workers are considerably reduced this year, the male officers and workers also stand the loss of this bonus since May, 1932.

All woman workers except the peelers are paid at time rates, but they are calculated by the day, and not like the male workers, by the month. The peelers, on the other hand, are piece-rate workers, being paid at so much per basket of cocoons peeled. For one basket the rate was 20-24 coppers last year and 18-21 coppers this year. In

one case last year the rate was 10 cents per 7 pounds, and as one basket generally weighs around 5½ pounds and ten cents last year were equivalent to approximately 29 coppers, this rate was about the same as the basket rate. One peeler can handle from two to eight baskets of cocoons a day, but the average handles only four baskets, making around 80 or 90 coppers. As our questionnaire calls for the maximum and minimum earnings per month of such workers, supposing they are employed all the time, for comparison with the wages of other kinds of workers, the data collected are in terms of the month.

In our questionnaire we specify only male, female, and child workers and apprentices, with maximum and minimum time and piece rates to be given separately for each kind of worker. That is all that we can require from the factories, since there are so many industries covered, and each industry has its own special classes of workers. For instance, the female time workers in the filatures can be further distinguished into the reelers (fileuse), substitute reelers, sorters, preparers of silk waste, preparers of cocoon refuse, connectors, twistors, re-reelers, etc. It is not possible to list all such workers of all industries in a general questionnaire, but our investigators were instructed to obtain such detailed data whenever they could from their informants. Besides, in most Chinese industries, there are official standard rates agreed upon between all employers and employees in the industry as represented by their respective associations, which are applied with slight occasional modifications to all establishments.

(ii) Standard Wage Rates

Table XXXI gives the wage rates for the years 1928-1930, while those for later years are given in subsequent tables. As the reelers or fileuses are the most important kind of workers in the filatures, as well as the most numerous, their minimum wage rate is the standard rate. On account of the sudden slump of silk prices in 1930, the scale for that year, so far as the minimum rate of the fileuse is concerned, represents a 15 per cent reduction from the 1929 rate, which was 60 cents per day. In 1931 the rate was the same, namely, 51 cents a day, but since the Japanese invasion of Shanghai in the first months of 1932, it was further reduced by another 15 per cent, on the original 60 cents, reaching 42 cents as the day rate. The workers acquiesced in this arrangement until the opening of the new season this year, when a widespread strike resulted in modify-

ing the discount, so that the reelers have since July 1 been receiving 75 per cent of the 60 cent standard rate, or 45 cents a day. The wage rates of other classes of female workers have undergone similar reductions and increases.

TABLE XXXI
WAGE RATES OF DIFFERENT KINDS OF FILATURE WORKERS
IN FORMER YEARS†

	1928		1929		1930	
	Max.	Min.	Max.	Min.	Max.	Min.
Reelers	62	58*	62	60*	62	51*
Basin workers	36	32	36	33	36	33
Sorters	58	34	60	36	60	36
Peelers	9	20**	10	20**	10	22**
Connectors	68	62	68	63	72	63
Twisters	67	33	67	33	67	33
Waste-preparers	40	32	40	36	40	36

†In cents per day.

*These are official standard rates agreed upon by all filature operating firms, although individual ones sometimes pay slightly more or less than these figures. It was reduced to 42 cents in 1932, but later raised to 45 as the result of a strike.

**In terms of coppers, 20 coppers being approximately 7 cents.

Our own investigations at a number of filatures show what modifications the wage rates were subjected to in different groups of filatures, and how the rates were sometimes modified in different filatures at different times. Tables XXXII and XXXIII are the wage rates adopted by the best filature in Shanghai and by a group of mills in the suburbs respectively. As both of these tables include rates for the latter half of 1931, which correspond to the time of another investigation of the same nature for certain filatures in a more centrally located district, as well as with that of our general survey last year, these rates are given in Table XXXIV to show how and where the different groups of mills differ in their scales of payment.

TABLE XXXII

WAGE RATES AT THE SINCHANG FILATURE

Department	(a) Jan.—Nov., 1930		(b) Dec., 1930 to May, 1931		(c) June—Dec., 1931		(d) Jan., 1932*	
	H	L	H	L	H	L	H	L
Finishing:**								
Connectors	\$0.68	\$0.63	\$0.61	\$0.57	\$0.67	\$0.62	\$0.59	\$0.55
Twisters	0.61	0.40	0.56	0.36	0.60	0.41	0.53	0.36
Re-reelers.....	0.45	0.25	0.40	0.24	0.46	0.27	0.40	0.24
Reeling:**								
Reelers	0.62	0.52	0.56	0.47	0.60	0.50	0.53	0.44
Substitutes	0.51	0.40	0.46	0.36	0.51	0.38	0.45	0.33
Basin-workers ..	0.41	0.25	0.37	0.22	0.39	0.25	0.34	0.23
Sorting:**								
Chief sorter.....	0.62	0.59	0.57	0.54	0.61	0.58	0.54	0.51
Sorters	0.58	0.25	0.52	0.23	0.56	0.26	0.49	0.23
Waste-preparing:**								
Preparers	0.43	0.25	0.37	0.24	0.41	0.27	0.36	0.24
Female officers***								
(in charge of								
24-30 reels)	27.00	25.00	24.00	22.50	26.00	24.00	26.00	24.00

*Between February and May, 1932, all workers receiving more than 50 cents a day had their wages reduced by one cent, while those receiving less than 50 cents met with no reduction.

**Wage per day.

***Wage per month.

TABLE XXXIII

WAGE RATES AT THE JIHHWEIKANG FILATURES*

Department	May 1931 to Mar., 1932	April, 1932	May, 1932
Reeling:			
Reelers	51	46	42
Substitute reelers	**	**	**
Basin workers	29	26	24
Substitute basin workers	72†	62†	60†
Finishing:			
Chief finisher	62	56	51
Connectors	55	49	45
Twisters	53	48	44
Re-reelers.....	35	31	29
Sorting:			
Chief sorter	51	46	42
Dupion sorters	40	36	33
Sorters	31	28	25
Waste-preparing:			
Preparers of silk waste	31	28	25
Preparers of cocoon refuse	29	24	22

*In cents per day.

**The substitute reelers had no fixed wage rates, but they were paid according to their individual merits.

†These figures are in terms of coppers, and about 30 coppers were equivalent to 10 cents.

TABLE XXXIV

COMPARATIVE WAGE RATES IN DIFFERENT DISTRICTS AND FILATURES

District or Filature	Jihhweikang District	General		Sinchang Filature	
	May, 1931 to Mar., 1932	1931		June-Dec., 1931	
Department		Minimum	Maximum	Minimum	Maximum
Sorting:					
Chief sorter	\$0.51			\$0.58	\$0.61
Sorters	0.31			\$0.26	\$0.56
All workers	0.31-0.51	\$0.24	\$0.58	0.26	0.61
Reeling:					
Reelers	0.51			0.50	0.60
Substitute reelers .				0.38	0.51
Child workers	0.29			0.25	0.39
All workers	0.29-0.51	0.18	0.58	0.25	0.60
Silk waste preparing					
Preparers of silk waste	0.31			0.27	0.41
Preparers of cocoon refuse	0.29				
All workers	0.29-0.31	0.34	0.36	0.27	0.41
Finishing Dept:					
Connectors	0.55			0.62	0.67
Twisters	0.53			0.41	0.60
Re-reelers	0.35			0.27	0.46
All workers	0.35-0.55	0.18	0.68	0.27	0.67

The Jihhweikang district is rather far away from the center of the city, and rent and food are both cheaper there, hence the lower wage rates for nearly all kinds of filature workers. In the second column of Table XXXIV are given the so-called general wage rates as supplied to us by the silk manufacturers in the more centrally located districts. Sinchang is one of the largest and oldest filatures producing high grade silk, and it is situated on Jessfield Road, not so far from the city. It can be readily seen that the "general" maximum rates are generally higher than the maximum at Jihhweikang, while those of Sinchang are higher still. The minimum rates of the two latter are sometimes lower than the minimum rates of all workers at Jihhweikang, but this is partly due to the fact that only one wage rate is given for each kind of worker in this district.

For 1929 some interesting data about wages in the silk industry are available in the Bureau of Social Affairs report, *Wages and Hours of Labor in Shanghai*. 518 male, 14,643 female and 4,873 child workers in this industry were covered by a survey conducted by that Bureau, and the result is reproduced in Table XXXV.

Unfortunately our own data are not for individual laborers, but give only the maximum and minimum rates in various filatures, and they are therefore incomparable with the material of the Bureau of Social Affairs. However, they are comparable in some respect with those in the foregoing tables.

(iii) A Special Wage System

In one particular filature, the Jihhsin mill at Lunghwa, where much improved equipment was used, a special investigation conducted by us last fall showed that a special wage system was in use there. It was really a time rate plus bonus system. The 60 cents a day rate was still maintained as the standard rate for the reelers, but as the filature, unlike other mills, supplied board and lodging to these woman workers, 7 cents were deducted from the wages as payment for the board. In fact, however, the three meals cost the filature 17 cents a worker a day, but the management deducted only 7 cents and the workers themselves paid 10 cents directly to the cook. This arrangement was presumably made to insure that the workers would all board at the plant, instead of buying their own meals outside.

This does not mean, however, that all the reelers received a flat rate of 53 cents a day. On the contrary, there were various kinds of bonuses and penalties depending upon the quantity produced by the worker, the denier and the evenness of the product. For instance, it was fixed as the standard that 7.875 ounces of peeled cocoons should produce 1.8 ounces of raw silk. If the reeler was able to produce additional silk in excess of this standard, she would be given a bonus of 40 cents for every ounce so produced. On the other hand, for every ounce below the standard she would be penalized 10 cents. The quantities of cocoons used and silk produced by each reeler were recorded, and the bonus given or penalty exacted at the end of every half month.

TABLE XXXVI
SUMMARY OF OUR OWN WAGE DATA

	1931						1932					
	Highest (in \$)			Lowest (in \$)			Highest (in \$)			Lowest (in \$)		
	Median	Mode	Mean	Median	Mode	Mean	Median	Mode	Mean	Medion	Mode	Mean
Female Workers												
Time Rate ..	16.69	15.36	17.06	11.28	14.28	11.65	13.16	13.03	13.68	7.00	6.85	7.69
Piece rate ..	8.75	6.75	10.08	5.23	4.78	6.39	5.60	5.74	6.05	4.20	4.20	4.03
Child Workers ...	9.80	9.27	10.04	7.33	7.29	7.72	6.94	6.64	7.22	6.37	*	6.37
Male Workers ...	35.16	33.40	34.35	15.22	14.83	15.95	24.00	24.31	25.64	10.33	10.86	11.22
Officers	116.00	142.50	115.85	14.50	*	14.42	80.00	78.00	92.41	10.00	10.57	9.68

*The mode cannot be clearly discerned.

TABLE XXXV

WAGES OF FILATURE WORKERS AS PER REPORT OF THE BUREAU OF SOCIAL AFFAIRS* (IN DOLLARS PER HOUR)

Kind of Work	Number of Workers Recorded	No of Workers Grouped According to Wage Received													Average Wage per Hour	No. of Hrs. per Day	Average Wage per Day	
		\$.005- .0149	.015- .0249	.025- .0349	.035- .0449	.045- .0549	.055- .0649	.065- .0749	.075- .0849	.085- .0949	.095- .1049	.105- .1149	.115- .1249	.125- .1349				.135- .1449	.145- —
<i>Males</i>																		
Engine Room	72			1	17	27	12	4	1	5	1	3			1	\$0.068	12	\$0.816
Miscellaneous	446					446										0.060	12	0.720
Total or Average	518			1	17	473	12	4	1	5	1	3			1	\$0.061	12	\$0.732
<i>Females</i>																		
Sorting	1,700		56	618	791	98	137									\$0.038	11	\$0.418
Reeling	9,214			2	42	4,786	4,384									0.055	11	0.605
Substitute	2,351			485	1,551	306	9									0.039	11	0.429
Waste-preparing	853			548	305											0.034	11	0.374
Finishing	525			22	23	84	380	16								0.057	11	0.627
Total or Average	14,643		56	1,675	2,712	5,274	4,910	16								\$0.049	11	\$0.539
<i>Children</i>																		
Basin Work	4,662		16	4,456	189	1										\$0.030	11	\$0.330
Waste-preparing	32			12	14	5	1									0.038	11	0.418
Finishing	179			22	70	83	2	2								0.034	11	0.374
Total or Average	4,873		38	4,538	286	8	3									\$0.030	11	\$0.330
Grand Total	20,034		94	6,213	2,999	5,299	5,386	28	4	1	5	1	3					1

*Wages and Hours of Labor, Greater Shanghai, 1929, compiled by the Bureau of Social Affairs, pp. 92-93.

TABLE XXXVII
 HIGHEST AND LOWEST WAGES OF THE FILEUSES AND THE BASIN WORKERS IN
 OUR OWN SURVEYS OF 1931 AND 1932

Monthly Wages in Dollars	Mid-value	1931				1932			
		Fileuses		Basin Workers		Fileuses		Basin Workers	
		H	L	H	L	H	L	H	L
3.50—3.99	3.75				1				
4.00—4.49	4.25								
4.50—4.99	4.75								
5.00—5.49	5.25		1		1				3
5.50—5.99	5.75				3		2		9
6.00—6.49	6.25		1		9		5	7	15
6.50—6.99	6.75		2	1	1		12	14	9
7.00—7.49	7.25		3	3	20		7	13	7
7.50—7.99	7.75		4	3	1		10	4	1
8.00—8.49	8.25		4	7	13		2	3	
8.50—8.99	8.75		2	5	3				
9.00—9.49	9.25		3	12	8				
9.50—9.99	9.75		3	4	2			1	
10.00—10.49	10.25		6	10	2		1	2	
10.50—10.99	10.75		1	4					
11.00—11.49	11.25		4	3			4		
11.50—11.99	11.75			1					
12.00—12.49	12.25		4	7	1	5			
12.50—12.99	12.75	1	2	1		8			
13.00—13.49	13.25	4	4	1		21			

[93]

Monthly Wages in Dollars	Mid-value	1931				1932			
		Fileuses		Basin Workers		Fileuses		Basin Workers	
		H	L	H	L	H	L	H	L
13.50—13.99	13.75	3	3			3			
14.00—14.49	14.25	4	9	1		1			
14.50—14.99	14.75					1	1		
15.00—15.49	15.25	9	3			2			
15.50—15.99	15.75	4	2			1			
16.00—16.49	16.25	6		2					
16.50—16.99	16.75	4				2			
17.00—17.49	17.25	1							
17.50—17.99	17.75								
18.00—18.49	18.25	7	3						
18.50—18.99	18.75	4							
19.00—19.49	19.25	4	1						
19.50—19.99	19.75								
20.00—20.49	20.25	8							
20.50—20.99	20.75								
21.00—21.49	21.25	2							
21.50—21.99	21.75								
22.00—22.49	22.25	2							
Total number of filatures		63*	65	65	65	44	44	44	44
		M = \$17.06	M = \$11.55	M = \$10.04	M = \$7.72	M = \$13.68	M = \$7.69	M = \$7.24	M = \$6.37
		Mo = \$15.36	Mo = \$14.15	Mo = \$ 9.27	Mo = \$7.29	Mo = \$13.03	Mo = \$6.85	Mo = \$6.82	Mo = \$6.28

Note:—H stands for highest and L lowest.

*There were two filatures in 1931 which did not supply the highest wages of their fileuses but gave all the other data,

With regard to the quality of the product, the reeler that could, for instance, produce 13-15 denier silk exactly up to the standard would receive a bonus of 6 cents per skein. If the product were 0.75 too fine or 0.50 too coarse, or anywhere between these two limits, there would be neither bonus nor penalty. Beyond these limits the reeler would be penalized at various fixed scales. As to the evenness, there would be a bonus of 5 cents per day if the evenness of that day's product averages 80, 10 cents for an average evenness of 85, 20 cents for 90, 30 cents for 95 and 40 cents for an evenness of 100. On the other hand, if the evenness were at 75, there would be neither bonus nor penalty, at 70 a penalty of 5 cents would be exacted, 10 cents at 65, 20 cents at 60, etc. In addition, another bonus of 3 cents per skein would be paid for good color and gloss.

In re-reeling one woman worker was expected to handle 4-12 reels. For each reel the standard was 4 skeins a day, and if the worker re-reeled more than that, she was given a bonus of $\frac{1}{4}$ the standard pay rate for every additional skein re-reeled. The standard rate in these cases was $5\frac{1}{2}$ cents a reel for those who could read the instructions and marks, and 5 cents for those who could not read.⁴⁶ Similar but simpler wage rates applied to other classes of workers. Because of the use of machinery for sorting and peeling the cocoons, the workers who did these jobs were also able to earn more money than those in other filatures. Like all other filatures, Jihhsin also gave a bonus of an extra day's pay when the worker had asked not more than three hours' leave during a half month, but unlike other filatures, there was no "caterpillar bonus" for the male officers and laborers.

A different form of bonus system was applied in the filatures at Jihhweikang, like Tungyi, Kwangyuan, and Paotai. There the denier, the relative quantity of silk to cocoons, and the absolute quantity of daily production were combined into one single coefficient of efficiency of 93. Denier was given a weight of 100 and the other two factors of 90 each, thus totalling 280 for all three or 93 for the average figure. If a reeler came up to this standard, she was given a daily wage of 58 cents. If the average daily production in a month exceeded the standard quantity by one ounce, or if the relative quantity of cocoons to silk, known as *tsiaoche* (纜折), was reduced by one catty,

⁴⁶The lower rate is presumably meant as a penalty for the trouble they cause the foremen in requiring frequent verbal instructions.

the worker was paid a bonus of 1 cent for that day. There was also a bonus for evenness and a penalty for lack of it at rates about the same as those in use in the Jihhsin filature.

Remuneration for officers and foremen in most filatures was made in the following way. For the boss of the reeling department a salary of \$52 was paid last year when he supervised 200 reels with an addition of \$2 for every additional 50 reels under his supervision and a deduction of \$4 for every 50 reels below the standard number. A foreman was supposed to look after two rows of 24-32 reels each, for which he received a monthly pay of \$34. If there were only one row in his charge, he would be paid 80 per cent of that amount.

CHAPTER X

WORKING TIME

(i) Number of Working Hours Per Day

Both Mr. T. Y. Tsha of the Shanghai Bureau of Social Affairs and Dr. Ta Chen of Tsing Hua University have given the average hours of work for male, female and child workers in the Shanghai silk reeling industry. Their figures do not quite agree with each other or with the figures we collected ourselves through our own survey, but the difference is rather small between Chen's data and our own, as may be seen from the following comparison.

	Male	Female	Child
Tsha	12	11	11
Chen	10.7	10.5	10.5
This Institute	10-11 hours (details to be given later)		

The male workers have slightly longer hours because their work is to pack the finished product, clean the machinery, clean the floor, operate the steam and other engines, deliver goods, etc., most of which has to be performed before and after the regular day's work of the other laborers. Similarly, although the filatures themselves refuse to admit the fact, we learn from the labor unions that the "basin workers," who constitute the majority of the child workers, generally arrive at the filature a few minutes earlier and leave a few minutes later than the reelers, in order to get the basins ready for the latter and have them cleaned after use. However, the extra working time of the male and child workers cannot be definitely fixed; what is fixed is the time of the female workers, in particular the reelers.

In our survey of 1931, 65 of the 66 filatures answered the inquiry on working hours, and one gave no definite reply, while in 1932, 43 of the 45 filatures answered. According to these data we obtain Table XXXVIII.

TABLE XXXVIII
NUMBER OF WORKING HOURS

No. of Hours	No. of Filatures	
	1931	1932
10	10	—
10½	12	13
10¾	2	1
11	41	29
Total	65	43
Average for all filatures	10 hrs. 45 min.	10 hrs. 50 min.

The working period usually lasts from 6 a.m. to 6 p.m., some from 5:30 a.m. to 5:30 p.m., and a very few cases from 5:45 a.m. to 6 p.m. or from 6:15 a.m. to 6 p.m. Although these would indicate that the majority of the filatures have 12-hour working days, the fact is that in most of them one hour is allowed for midday meal and a quarter of an hour to half an hour for afternoon rest, at about 3 p.m. This arrangement is quite reasonable, as the workers are more easily fatigued in the afternoon, after having already done many hours' work, than in the morning. As to the male and basin workers, although their hours are longer, their work is lighter. This is especially so with the male workers, as they hardly have continuous work during the day. They may have to move heavy burdens from which the women workers are exempt, but their work is intermittent, and in that sense lighter than the women's. As to the basin workers, they need only keep the cocoons stirred in the basin, a process known as "beating," which engenders little nervous or muscular strain.

(ii) Number of Working Days Per Month

With regard to the number of working days per month, the filatures also have no uniform system in use, although the majority of them have 28 days, giving one rest day to the workers every half month. The following table shows how some of them have as little as 24 days, not so much because they think the workers need more rest, but because business has been bad, and the fewer working days a month the less they have to pay the workers, the majority of whom are paid by the day.

TABLE XXXIX

NUMBER OF WORKING DAYS PER MONTH

No. of Working Days Per Month	No. of Filatures	
	1931	1932
24	1	—
25	7	1
25-26*	1	—
26	9	1
26-27	2	—
27	4	4
27-28	1	—
28	35	39
29	—	—
30	1	—
Total	61	45
Average for all filatures	27.2 days	27.8 days

*This means that they worked 25 days in some months and 26 in others. Similarly with 26-27 and 27-28.

As most of the filatures of this year had been reorganized, they were unable—excepting a very small portion of them—to supply the information about the actual number of months and days they worked during the previous year. In the survey of 1931, 64 filatures gave the number of days and only 62 the number of months also. There was also one filature supplying the former information in the 1932 survey. As may be seen from Table XL and XLI, there were in 1931 five filatures in operation for less than 120 days, yet there were only three working below four months. This does not however mean any inconsistency in their replies, because, for instance, the one in operation for only 88 days had that number of days spread out over five months. A few other cases are of the same nature, and that is the reason why these filatures could not give the number of working days per month to be included in Table XXXIX, since the number in these cases fluctuated very widely from month to month.

TABLE XL

NUMBER OF WORKING MONTHS IN THE PRECEDING YEAR

No. of Months	Mid-value	1931 Survey		1932 Survey	
		No. of Filatures	Percentage	Filatures No. of	Percentage
2.01— 3.00	2.5	1	1.6	1	5.3
3.01— 4.00	3.5	2	3.2		
4.01— 5.00	4.5	4	6.4	3	15.8
5.01— 6.00	5.5	2	3.2	3	15.8
6.01— 7.00	6.5	8	12.9	3	15.8
7.01— 8.00	7.5	4	6.5	2	10.5
8.01— 9.00	8.5	9	14.5	4	21.0
9.01—10.00	9.5	20	32.3	1	5.3
10.01—11.00	10.5	8	12.9	2	10.5
11.01—12.00	11.5	4	6.5		
Total		62	100.0	19	100.0
			M=6.82		M=7.34
			Mo=9.49		Mo=8.38

TABLE XLI

NUMBER OF WORKING DAYS IN THE PRECEDING YEAR

No. of Days	Mid-value	1931 Survey		1932 Survey	
		No. of Filatures	Percentage	No. of Filatures	Percentage
40— 59.9	50	1	1.6		
60— 79.9	70	1	1.6		
80— 99.9	90	1	1.6	1	5
100—119.9	110	2	3.2		
120—139.9	130	1	1.6	1	5
140—159.9	150	4	6.3	3	15
160—179.9	170	1	1.6	2	10
180—199.9	190	7	11.1	4	20
200—219.9	210	2	3.2	2	10
220—239.9	230	5	7.9		
240—259.9	250	12	19.0	4	20
260—279.9	270	7	11.1		
280—299.9	290	12	19.0	1	5
300—319.9	310	3	4.8	2	10
320—339.9	330	4	6.4		
Total		63	100.0	20	100.0
			M=234.21		M=204.92
			Mo—not clearly discernible		Mo—not clearly discernible

In Dr. Ta Chen's Study of the Applicability of the Factory Act of the Chinese Government based on a preliminary survey of the Shanghai area in 1931, at about the same time as our 1931 survey, it is stated that the average number of rest days and holidays in the silk reeling industry, as calculated from the replies of 29 silk filatures to his special questionnaire, is 32.5 in a year, while the average of all industries, calculated from 228 answered questionnaires, is 31.2 days.⁴⁷ This means that the silk reeling industry has a slightly larger number of rest days and holidays than the average figure for all industries. Referring to the latter, Dr. Chen says that "this may be viewed as being equivalent to 24 rest days (2 a month) and almost 8 national holidays." Instead of "national holidays" he should perhaps have said "holidays" only, since a few paragraphs later he gives the average number of various kinds of holidays for all industries: National 4.7 days, festival 1.7, solar new year 3.9, and lunar new year 4.1. Whatever that may be, it shows that the system of two rest days a month is a prevalent practice in Shanghai filatures, as our own surveys also prove.

⁴⁷Ta Chen, *Study of the Applicability of the Factory Act of the Chinese Government, 1931*, p. 12.

CHAPTER XI

COST OF PRODUCTION

(i) *Cost of Raw Material*

After having considered the various factors in the production of silk, we are now in a position to discuss the cost of its production. However, as our first survey was more extensive than intensive, and as the silk industry was in an abnormal situation at the time of our second survey, we were unable to secure detailed data about cost from each filature. All that we could obtain was what is generally known as primary cost, namely, the cost of raw material and direct labor. In addition we have found a way to estimate the cost of power supply. We shall first consider the cost of the raw material—silkworm cocoons—and in order to understand the situation thoroughly, we shall go one step further and discuss the cost of producing the cocoons themselves. For, without knowing the latter, it will be hard to explain the wide fluctuation of silk and cocoon prices during the last two years.

The principal item of cost in the producing of cocoons is the cost of feeding the silkworms from the time the larvae just come out of the eggs to the time when the full-grown worms make the cocoons. In other words, it is the cost of the mulberry leaves which counts most. Although there is also some human labor involved in feeding and looking after the silkworms, it is usually performed by the women and children of the farmers' families, and requires only a part of their time. The purchase price of silkworm eggs, the cost of a few simple articles of equipment, and other miscellaneous expenses, are negligible in comparison with the cost of mulberry leaves. In the following, therefore, only this item will be estimated.⁴⁶

Mulberry leaves may be supplied from the farmer's own land or from purchases. In the former case, the cost of mulberry leaves can only be figured on the basis of value of a rice crop which would

⁴⁷The figures below are based partly on those in an article by Hsia Tao-hsiang in the *Foreign Trade Guide* Vol. II, No. 2, the official Chinese publication of the Bureau of Inspection and Testing of Commercial Commodities and partly on our own investigation.

otherwise be raised on the land if it were not used for growing mulberry. In the latter case, the market price of the leaves is known, and although it fluctuates quite violently with the demand, from less than a dollar to five or six dollars a picul, the minimum value of the leaves can be gauged by the former case. The silkworms must eat fresh leaves just picked from the mulberry trees, and if the supply of such leaves on any day at any place is much below the demand for the same, their price may go up very high. Contrariwise, if the supply is larger than the demand, the leaves will be sold even at a loss, because they would be valueless if they were kept another day. Thus there is a good deal of speculative risk to both the producer of mulberry leaves and the raiser of silkworms. To avoid such risk the latter often places a standing order with the former for a certain quantity of leaves per day at an agreed price, which is usually lower than the normal market price, (i.e., the price prevailing when there is no great discrepancy between the supply and the demand), but this practice is not made use of by all silkworm raisers.

(ii) *Cost of Mulberry Leaves*

One *mow* of mulberry land will produce about ten piculs of leaves a year. As such land, when converted into rice fields, will produce only one picul to one picul and a half of rice, valued at \$10 to \$15 (the price of one picul of rice of such quality in Hangchow is approximately \$10), the value of the mulberry leaves may be put at \$1.00 to \$1.50 per picul. Ten piculs of leaves are generally sufficient to feed three *mace* (one *mace* is one-tenth of an ounce, Chinese weight) of silkworm larvae until the time they complete the spinning of the cocoons. Since 45 to 55 catties (one catty is equivalent to 16 ounces or 1.33 pounds avoirdupois) of fresh cocoons are usually obtained from three *mace* of larvae, (the basis of estimate is 15-18 catties per *mace*), the cost of mulberry leaves per catty of fresh cocoons is thus from 18 to 33 cents and the average 26 cents.

When the leaves are bought from other people, a slightly larger quantity is necessary to feed each *mace* of silkworm larvae. On the average one picul of small leaves and 2.5 piculs of large ones are necessary. The latter are always bought in such cases, but the former are sometimes produced on the farm from the few mulberry trees which almost all farmers have, even though they have no land

devoted to growing them. If the large leaves are bought on a standing order, their price is about \$2.00 per picul; if bought in the open market, from \$2.50 to \$6.00. The average price in the latter case may be put at \$4.00. To facilitate calculation, an average of 16.5 catties of fresh cocoons per mace of larvae, obtained by averaging 15 and 18 catties, is used. The value of small leaves is assumed at \$1.25 per picul. Four possible cases present themselves.

a. When the small leaves are supplied from one's own farm and the large leaves bought on a standing order—

$$\frac{1 \text{ (s)} \times \$1.25 + 2.5 \text{ (l)} \times \$2.00}{1.65} = \$0.39$$

b. When the small leaves are supplied from one's own farm and the large leaves bought in the open market—

$$\frac{1 \text{ (s)} \times \$1.25 + 2.5 \text{ (l)} \times \$4.00}{1.65} = \$0.68$$

c. When both large and small leaves are bought on a standing order—

$$\frac{3.5 \text{ piculs} \times \$2.00}{1.65} = \$0.42$$

d. When both large and small leaves are bought in the open market—

$$\frac{3.5 \text{ piculs} \times \$4.00}{1.65} = \$0.85$$

(s) Small leaves. (l) Large leaves. Unit, a catty.

From the above figures the author of the article from which the figures are taken arrives at the conclusion that the first two cases are much more economical than the latter two, and therefore it is more economical for the silkworm raisers to grow their own mulberry trees. This remark of course holds true when we also take into consideration of the case where all leaves are supplied from one's own farm, and where the cost of such leaves per catty of fresh cocoons is only \$0.26. But when all or a large proportion of the leaves are bought from outside, the important factor is the way they are bought, since the average price of leaves bought in the open market is exactly twice that bought on a standing order. For instance, in case (d) the cost is proportionally twice that in case (c), while that in cases (a) and

(c) is nearly the same. Hence, if some or all leaves have to be bought from outside, it is much more economical to place a standing order with the supplier than to buy in the open market.

The value of mulberry leaves produced on one's own farm is estimated in the above account on the basis of what economists call the opportunity value of the land. In other words, it is based on the value of rice that would be produced on such land if it were not used for growing mulberry trees. We have, however, estimates of our own based on the actual cost of producing mulberry leaves in certain localities in Chekiang, e.g. Pinghu. The first item of cost is the annual rent of land, which in such cases is about \$1.50 per *mow*. Land tax amounts to 80 cents. Labor and cost of fertilizers are estimated at \$1.50 to \$2.00 per *mow* per year. The total of these four items is \$3.80 to \$4.30. Since the mulberry trees take five to six years to grow to the size when their leaves can be used for feeding silkworms, and since after that they will last only about ten years, after which the trees will wither and die, the production should be calculated on the basis of ten years only, while the cost have to be borne for 15 or 16 years. The farms we investigated produced only five to eight piculs of leaves a year, or an average of 6.5 piculs. As the picul there weighs only about 80 instead of 100 catties, the actual weight of the average production is only about five piculs. In ten years the total production would be 50 piculs, and the cost from \$57 to \$64.50. The average cost per catty of leaves is therefore \$1.215. This figure agrees quite well with that in the former estimate.

(iii) *Cost of Dry Cocoons*

From the above calculations the principal item of cost in producing a catty of fresh cocoons—that of the mulberry leaves—varies between 18 and 85 cents. The range of variation is therefore too wide to fix a single definite price for the cocoons. On the other hand, the additional cost of making dry cocoons out of the fresh ones is more easily determined. It usually takes from 300 to 350 catties of the latter to turn out 100 catties (i.e. a picul) of the former. Thus the price of the latter must be 3 to 3½ times that of the former, plus the following items, estimated by the cocoon merchants on the basis of one picul of dry cocoons in former years: Oven rent, \$5.00; salaries and wages, \$5.00; fuel, \$2.50; miscellaneous expenses, \$4.50; transporta-

tion cost to Shanghai, \$2.00 (it varies from \$1.40 for Pinghu, Chekiang, to \$2.40 for Shaohing, and the average for all localities is a little below \$2.00); tax, \$12.00; total, \$31.00. This year the rent is only about a third of that prevailing formerly, salaries and wages have also been considerably reduced, tax entirely abolished, but miscellaneous expenses somehow increased. As these items have undergone different degrees of changes in different places, no general estimate has yet been made, but the total additional cost is said to be between \$15.00 and \$24.00.⁴⁸

On these bases if one picul of fresh cocoons sells at \$30, then one picul of dry cocoons would cost \$121-\$136 last year or \$114-\$129 this year. However, the actual discrepancy in prices of these years is much greater and is due more to the depressed silk market than the lower expenses of drying and transportation.

More definite figures have been obtained in regard to the transportation cost per picul of dry cocoons from various places in the interior to Shanghai. According to the filature people, it is cheapest when shipped in junks, more expensive to have the junks tugged by steamboats and most expensive to ship over the railways. The hire of the junk varies with its capacity, one capable of transporting 300 bales (on the average 30 catties a bale) will cost \$30 to \$40 as hire for a trip from Wusih (Kiangsu) or Huchow (Chekiang) to Shanghai. About \$40 more will be the cost of hiring a steam tug. For smaller quantities for which no junk is hired, the shipping cost is 28 cents per bale from either of these two places.

In connection with the general survey in 1931 a special inquiry was made at a number of factories concerning the transportation cost of their raw materials and products. Thirteen filatures answered this inquiry, and from their replies the following data are obtained with regard to the transportation cost of a picul of dry cocoons from various localities in Kiangsu and Chekiang. The rates often differ on account of the size of the shipments or of special arrangement with the ship or transportation company (most shipments over the railways are made through the latter), as much as of the distance.

⁴⁸These estimates are supplied by the Silk and Cocoon Association of Shanghai, and are slightly different from information we obtained from other sources. As the latter are also estimates, and not so detailed, they are not worth giving here.

<i>Locality</i>	<i>By Railway</i>	<i>By Boat</i>
Kiangsu Province:		
Wusih		\$1.30
Liyang		\$1.13*
Chekiang Province:		
Hangchow	\$1.125-\$1.30	\$0.75
Huchow		\$1.50-\$2.00
Kashing	\$1.90	\$1.50
Pinghu		\$1.19-\$1.30
Haining	\$1.50-\$1.60	\$1.20
Changan	\$1.00	
Chungteh		\$2.63
Shwanglin		\$0.34

*Junk, without steam tug.

Table XLII shows the freight rates on dry cocoons as supplied to us by the Shanghai-Nanking and Shanghai-Hangchow-Ningpo Railway way Administration.

TABLE XLII
RAILWAY FREIGHT RATES TO SHANGHAI

	25-ton Carload Rate (per ton) Formerly	Since Aug. 14, 1931	50-Kilo- gram Parcel Rate
Kiangsu stations:			
Changchow	\$3.08	\$2.20	\$0.44
Wusih	2.60	1.55	0.37
Tsishuyen	2.90	2.11	0.42
Wanglin	2.87	2.05	0.41
Soochow	2.05	—	0.29
Kunshan	1.50	—	0.21
Chekiang stations:			
Chakow	4.52	3.60	1.36
Changan	4.00	3.40	1.19
Kashing	2.97	1.78	0.88

From these figures it would appear that the carload rate of the railways are much lower than the rates charged by the boats, as it works out to less than ten cents a picul (one ton=16.8 piculs) under the new tariff for Wusih, while the boat charges (though they include loading, unloading and delivery charges) amount to \$1.30. However, the silk merchants maintain that less than ten tons of dry cocoons will fill a 25-ton car, and the usual rate is therefore many times higher than the tariff seems to indicate.

(iv) Cost of Cocoons in Relation to Silk Production

It is the custom with the silk people to call the ratio between the quantities of fresh and dry cocoons as *hongche* (烘折) and that between dry cocoons and the quantity of silk produced as *tsiaoche* (繅折). Some paragraphs back we have already pointed out the former ratio to be from 3:1 to 3.5:1. As to the latter, it is generally taken to be 6:1, although our own surveys of the filatures show that there is in fact much wider variation in this ratio. In Table XLIII are shown the various quantities of silk produced from one picul of dry cocoons, as reported by the different filatures in 1931 and 1932. The quantity was larger in the former than in the latter year, the ratios being approximately 5.8:1 and 6.4:1 respectively.

In the next table (Table XLIV) is given the percentage relation which the cost of cocoons bore to the price of silk. Both the mean and the mode in 1931 were above 90 per cent, and some individual filatures reported above 100 per cent. This may appear unreasonable, but it is nevertheless quite possible. In the first place, the filatures in 1931 lost heavily because the cost of cocoons was often higher than the price of silk. Secondly, there were by-products which helped make up the loss. Thirdly, the percentages in this table are calculated from four sets of data supplied to us by the filatures: (1) the quantity of dry cocoons required every month, (2) the price of such cocoons, (3) the quantity of silk actually produced in the preceding year or month (if the filature was reorganized during the year), and (4) the price of silk of the grade produced by the filature. If (3) and (4) represented the conditions of the preceding year and (1) and (2) those of the current year, then there is naturally some discrepancy between the four sets of figures which might account for the high percentages. However, as the price of silk was higher and more silk was produced in 1930 than in 1931, this is unlikely the reason. What is more likely is that the quantity of cocoons considered to be necessary is larger than what was actually consumed. In 1932 only 26 filatures supplied the same data, but the price of cocoons had already fallen considerably with the slump of the silk market, and the percentage relation between the cost of cocoons and the price of silk was therefore much lower. This table should be considered as representing in a general way the changes in the raw material cost in these two years, but should not be taken as any accurate representation of the situation.

FIG. 5. SEASONAL VARIATION IN SILK AND COCOON PRICES

上等白廠經及無錫乾繭之季節變化指數圖

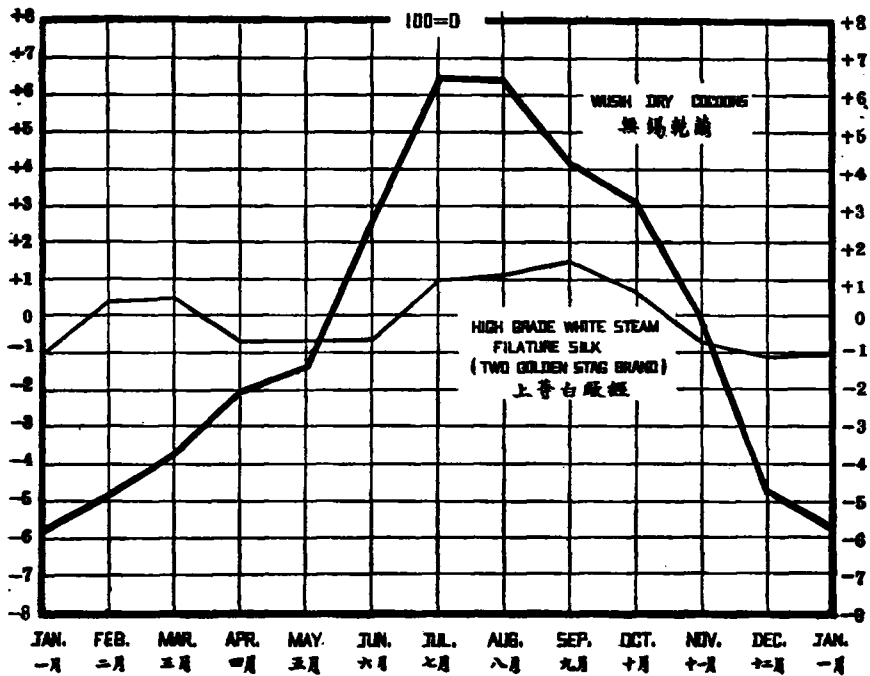


TABLE XLIII

QUANTITY OF SILK PRODUCED FROM ONE PICUL OF DRY COCOONS

Quantity (piculs)	Mid- value	1931		1932	
		No. of Filatures	Percent- age	No. of Filatures	Percent- age
13—13.9	13.5	1	1.5	4	9.5
14—14.9	14.5	1	1.5	2	4.8
15—15.9	15.5	3	4.6	15	35.7
16—16.9	16.5	20	30.3	13	30.9
17—17.9	17.5	8	12.1	2	4.8
18—18.9	18.5	19	28.8	3	7.1
19—19.9	19.5	2	3.1	2	4.8
20—20.9	20.5	7	10.6		
21—21.9	21.5	1	1.5		
22—22.9	22.5	2	3.0	1	2.4
23—23.9	23.5				
24—24.9	24.5				
25—25.9	25.5				
26—26.9	26.5	2	3.0		
Total		66	100.0	42	100.0
		M=18.13		M=16.21	
		Mo=17.56		Mo=15.71	

TABLE XLIV

PERCENTAGE RELATION BETWEEN RAW MATERIAL COST
AND PRICE OF OUTPUT

Percentage Relation	Mid-value	1931		1932	
		No. of Filatures	Per Cent of Total	No. of Filatures	Per Cent of Total
35.00—39.99	37.5			1	3.9
40.00—44.99	42.5			2	7.7
45.00—49.99	47.5			2	7.7
50.00—54.99	52.5			5	19.2
55.00—59.99	57.5	1	1.6	2	7.7
60.00—64.99	62.5	2	3.3	2	7.7
65.00—69.99	67.5	5	8.2	1	3.9
70.00—74.99	72.5	2	3.3	1	3.9
75.00—79.99	77.5	5	8.2	1	3.8
80.00—84.99	82.5	5	8.2	2	7.7
85.00—89.99	87.5	4	6.6	1	3.8
90.00—94.99	92.5	10	16.4	3	11.5
95.00—99.99	97.5	12	19.7	2	7.7
100.00—104.99	102.5	4	6.5		
105.00—109.99	107.5	3	4.9		
110.00—114.99	112.5	2	3.3		
115.00—119.99	117.5	1	1.6		
120.00—124.99	122.5	2	3.3		
125.00—129.99	127.5	2	3.3	1	3.8
130.00—134.99	132.5	0			
135.00—139.99	137.5	1	1.6		
Total		61	100.0	26	100.0
		M=92.10%		M=68.48%	
		Mo=96.67%		Mo=52.50%	

(v) Labor and Other Costs

The second important factor in the cost of producing silk is direct labor cost. Although the filatures treated male laborers as officers and caused us no little trouble in ascertaining the actual number of their workers, this practice however facilitates the distinction between direct and indirect labor cost. The male laborers who are generally treated as officers do not perform any work in direct connection with the manufacturing of silk, and may therefore be considered as indirect labor. The only pity is that such indirect labor cost cannot be separated from management overhead, as represented by the salaries of the real officers. At any rate, the percentages are very small, as may be seen from Tables XLV. They show how little of the product is distributed among the laborers as wages.

TABLE XLV
PERCENTAGE RELATION BETWEEN DIRECT AND INDIRECT LABOR COST, MANAGEMENT
OVERHEAD, AND PRICE OF OUTPUT*

Percentage Relation	Mid- value	1931						1932					
		Wages		Salaries		Both		Wages		Salaries		Both	
		No. of Filatures	Percent- age	No. of Filatures	Percent- age	No. of Filatures	Percent- age	No. of Filatures	Percent- age	No. of Filatures	Percent- age	No. of Filatures	Percent- age
0—1.499	7.5			5	8.5					3	12.5		
1.5—2.999	2.25			30	50.8					16	66.6		
3.0—4.499	3.75			19	32.2					3	12.5		
4.5—5.999	5.25	1	1.7	3	5.1					1	4.2		
6.0—7.499	6.75	5	8.5	1	1.7	1	1.7	1	4.2	1	4.2		
7.5—8.999	8.25	2	3.4	1	1.7	2	3.5	2	8.3			1	4.2
9.0—10.499	9.75	8	13.5			2	3.5	8	33.4			2	8.3
10.5—11.999	11.25	8	13.5			6	10.3					6	25.0
12.0—13.499	12.75	12	20.3			7	12.1	2	8.3			2	8.3
13.5—14.999	14.25	7	11.9			8	13.8	2	8.3			2	8.3
15.0—16.499	15.75	5	8.5			9	15.5	6	25.0				
16.5—17.999	17.25	5	8.5			8	13.8	2	8.3			3	12.5
18.0—19.499	18.75	3	5.1			4	6.9	1	4.2			5	20.8
19.5—20.999	20.25	2	3.4			5	8.6					1	4.2
21.0—22.499	21.75					3	5.2					1	4.2
22.5—23.999	23.25	1	1.7									1	4.2
24.0—25.499	24.75					1	1.7						
25.5—26.999	26.25					1	1.7						
27.0—28.499	27.75					1	1.7						
Total		59	100	59	100	58**	100	24	100	24	100	24	100
		M = 12.83		M = 2.93		M = 15.80		M = 12.58		M = 2.47		M = 15.07	
		Mo = 12.64		Mo = 2.69		Mo = 15.67		Mo = 9.6		Mo = 2.25		Mo = 11.36	

*Wages in the silk filatures represent roughly the direct labor cost, and salaries the management overhead and indirect labor cost.

**Altogether 60 filatures supplied these figures, but one of them supplied only the wage figure, and another only the salary figure. Hence one is omitted from each of these columns and two from the wage and salary column.

The cost of power supply can be estimated on the basis of what has been said in the section on motive power. As is pointed out there, the engine room is farmed out to a boss called the *lao-kwei* usually at \$0.55 a reel a month, not including the supply of coal. The cost of the latter is approximately 0.30 taels a reel a day, or at the present official rate of conversion, \$0.42. This works out at about \$1.25 a reel a month. The two items together, which nearly represent the total cost of power supply, amount therefore to \$1.80 per reel per month. Since the production of silk per reel varied in our two surveys between 11.5 and 12 ounces a day, or between 20 and 21 catties a month, and the price of silk was 917.50 and 480 taels a picul in these two years respectively, the cost of power supply would amount to 0.7 per cent in 1931 and 1.34 per cent in 1932 of the silk price. However, as the estimates were made in 1932, they would apply more properly to the latter year, and 1.34 per cent would represent the situation more correctly. Yet both wages and the price of coal had not fallen as much as the price of silk, and so the percentage in 1931 must necessarily be lower than that in 1932.

Other cost items, such as depreciation and interest on capital, have not been ascertained, nor can they be even approximately estimated. In the section on capital, we have indicated the interest rates, but the variation is too wide to be useful for making estimates. Similarly, the amount of money borrowed from the banks, and the length of such loans, vary widely also. There is, however, no question that such interest charges make up quite a large item in the cost of silk production.

It would be best if we could secure balance sheets of all filatures and find out what amount of profit or loss they made or sustained in the previous year. Unfortunately this is impossible, as most filatures have nothing like modern balance sheets, and whatever figures they have about their profit and loss, they are unwilling to supply the information to outsiders. As they are mostly partnership firms, there is no legal requirement that they should make such figures public. To get around this difficulty we worded our questionnaire in such a manner that they needed only to mention the approximate percentage of profit and loss on their capital at the time of our investigation and during the best and worst years within their memory. They were also asked to specify what the best and worst years were.

In reply to these questions, seventeen filatures supplied the data which are tabulated below.

TABLE XLVI
PROFIT AND LOSS

Filature	1931	Profit in Best Years		Loss in Worst Years	
		Per-centage	Years	Per-centage	Years
A	Loss	10 odd	1925, 26	—	1930, 31
B	—	10	1929	300	1930
C	—	No	No	100	1930
D	Loss	80	1926, 27	—	1930, 31
E	Loss	No	No	200 odd	1930, 31
F	Loss 130	No	Never	250	—
G	—	90	1928	120	1930
H	Loss	No	No	200	1930
I	Loss	No	No	100	1930, 31
J	Loss 35	—	—	130	—
K	Loss	No	No	—	1930
L	Loss 35	—	—	33	1930
M	—	100	1925, 26	200	1930
N	Loss	10	1925, 26	—	1929, 30
O	—	100	1925, 26	200-300	1930
P	—	even	1929	93	1930
Q	Loss	100	1927	—	1930

The above shows that few of them were able or willing to give definite information about the loss in 1931, but it was the consensus of opinion that 1930 was the worst year, and 1925 and 1926 the best years. Since the initial capital was small in all cases, we need not be surprised by the 100-300% losses which nearly all of them sustained in the previous year. The highest profit they made was on the other hand only 100 per cent.

CHAPTER XII

(i) *Various Kinds of Middlemen*

Chinese raw silk reaches foreign markets in two ways: (a) through export firms or (b) shipped abroad by Chinese trading companies.⁴⁹ In the former case, between the producer, that is, the Chinese silk filatures, and the ultimate consumer abroad there are the *sze hao* (絲號) or *sze tsan* (絲棧 raw silk broker), the *sze tung shih* (絲通事 interpreter), the compradore and the foreign export firm, each performing the functions of the middleman or commission agent. In order to give the reader some idea of the business practices in connection with the raw silk export trade in Shanghai, it is necessary to make brief mention of the part played by each of these middlemen in the trade.

The bulk of raw silk consumed in foreign markets is now produced by the modern filatures, which collect cocoons from the silk farmers in the interior. Most of the silk filatures are built and financed by Chinese capitalists, although one in Shanghai was owned and operated by foreigners. An estimate made in 1931 puts the total number of such filatures in the silk producing districts of Kiangsu and Chekiang (including Shanghai) at 185. The *sze hao* is one of the principal intermediaries between the silk filature and the foreign export firm. It is established by either an individual Chinese capitalist or a group of them in partnership, capitalized at \$100,000 or more. Since the firm is well-capitalized, it often advances loans to silk filatures on the condition that the latter's output is to be sold through the medium of the *sze hao*. So one *sze hao* often has such financial relations with three or four silk filatures. The *sze-hao* also keeps godowns for silk merchants or filatures to store their goods, on which loans can be negotiated by their owners. Over ten *sze hao* are operating in Shanghai, the most prominent ones being the Hsu Feng, at 23A Szechuen Road, the Yung Ta, at 38 Avenue Edward VII, the Hsiang

⁴⁹The information here is mostly taken from a Chinese pamphlet issued in August, 1932, by the Foreign Trade Association of China.

Tai, at Sheng An Li, Ningpo Road, the Fang Sun Feng, at 60 Ching Shun Li, Peking Road, etc.

The *sze tsan* performs exactly the same functions as the *sze hao*, the only difference being that the *sze hao* handles exclusively steam filature silk produced in Shanghai and other places in Chekiang and Kiangsu provinces, while the *sze tsan* disposes of raw silk on behalf of silk merchants from Szechwan, Hupeh and Shantung. On their arrival in Shanghai, merchants from these provinces usually have their goods stored in the godowns maintained by the *sze tsan* where the merchants have the shipments re-packed and the silk trimmed or dressed to improve its appearance before selling it to foreign firms through the medium of the *sze tsan*. About ten *sze tsan* are operating in Shanghai. The Pao Tai Ho, Yih Chang Hsiang, Pao Yuan Hsiang, Hsu Chang and Tung Kung handle raw silk from Szechwan and Hupeh, while the Ho Hsu Tsan, Yih Feng Tsan, Heng Sing Ho Kung Tsan and Heng Hsiang Tung Tsan undertake to sell tussah silk from Shantung.

(ii) *The Compradore and the Export Firm*

The compradores and *sze tung shih* were formerly mere employees of the foreign export firms and the *sze hao* respectively but at present they have become a class of independent brokers. Originally, they were employed simply to smooth over the linguistic difficulties between the managers of the *sze hao* and the foreign export firms, their duty being then confined to interpretation. But gradually the compradore becomes a commission agent of the foreign firm and also has the control of the *sze lou* (絲樓) which will be dealt with presently. When a purchase is made by the foreign export firm through his medium, he charges the firm a commission. Sometimes the compradore advances money to Chinese silk merchants on behalf of the foreign firm he represents, thereby facilitating business transactions. Some compradores even run *sze hao* themselves and have therefore become a rather important factor in the silk export trade. The *sze tung shih* has also ceased to be a salaried servant of the *sze hao*; on the contrary some of them have established *sze hao* themselves and become rivals to those who used to be their employers.

The foreign export firm usually represents raw silk buyers in foreign countries. When a purchase is made, the firm charges a

commission to the buyer abroad, who is either a raw silk dealer or a silk mill. At the head of the foreign export firm, there is always a *taipan* or foreign manager, who is in immediate touch with the buyers abroad. When the *taipan* receives telegraphic orders from abroad for purchasing raw silk, he usually sends the compradore to approach the silk filatures for the necessary quantity of raw silk to be bought at a price named by the *taipan*. The compradore also has charge of the *sze lou*, an office responsible for all affairs in connection with the purchase and export of raw silk, including examination, packing, weighing, declaration, and loading of the cargo for shipment abroad and the payment of the purchase price. A raw silk export firm usually comprises the following departments: (1) the *taipan's* office, (2) the *sze lou*, (3) the business office, which has charge of the firm's money matters and is under the direct control of the *taipan*, (4) the godown, in which raw silk delivered by the sellers is stored, and (5) the re-reeling room.

The organization of a Chinese raw silk trading company is more or less similar to that of a foreign export firm just described. Of such trading companies four were operating in Shanghai in 1929—the Toneying Silk Trading Co., the Hu Lin, the Wei Chen, and the Hwa Tung. In August, 1932, only the Tonyin, at 15 Museum Road, was operating. The company has agents in foreign countries to dispose of, or to accept orders for, raw silk on its behalf. Such agents are usually appointed under a contract effective for one year. In the contract it is stipulated that the agent should not dispose of raw silk for another seller, while the company is also bound not to appoint a second agent in the same port. The agent charges a commission of from 0.625 to 1 per cent of the purchase price of the raw silk disposed of.

When a filature intends to solicit orders from a foreign export firm, or when a foreign firm intends to award orders to a filature, the *sze hao* is often called in to act as middleman. Occasionally, however, business is transacted directly between a filature and an export firm. When a filature intends to sell its product, the filature manager often approaches the manager of the *sze hao* with a detailed description of the brand, grade, size and other particulars of the cargo for sale and names the price. The *sze hao* then sends a canvasser to call at the various export firms to inquire about the market conditions in foreign countries and the prices prevailing there. The canvasser

then reports to the filature manager the result of his inquiry. If any price is offered by the foreign firms, he also quotes the price.

(iii) Spot and Future Delivery

Raw silk is sold either for spot or future delivery, the latter being more common. For future delivery the time limit is generally fixed at 4 to 5 months in the case of steam filature silk and about one month in the case of native reeled silk. A contract in tripartite copies in both English and Chinese is generally made, stating the number of bales, the description and the price of the silk, and the date of delivery. The price has always been stated in Shanghai taels. The size and other particulars of the silk are also specifically stated, either in the contract or in a separate paper called the certificate, for size and winding. In case of spot delivery, sometimes a contract is made but usually no such paper is considered necessary. The foreign firm simply enters into its account the brand, size, grade and the number of bales of silk purchased, the price and the date of delivery. This system of trading is based entirely upon mutual trust, and has always worked out satisfactorily. In spot buying the goods are always delivered within three days of the conclusion of the deal and in future buying at the due time. In both cases, the goods are delivered to the godown specially designated by the foreign firm. On receiving the goods the foreign firm issues a receipt, giving a detailed description of the shipment received, the cost of delivery being borne by the filature. If on examination the goods are found up to standard, the foreign firm accepts them without any other question, but, if otherwise, the goods are returned to the filature for a better consignment. The foreign firm usually notifies the filature whether the goods are acceptable or not in three or four days after delivery. If the goods are returned, the foreign firm is not responsible for any cost incurred in the removal of the goods, nor does it hold itself accountable for any loss or damage to the silk caused by examination. If the silk is found up to standard and remains in the foreign firm's godown, the firm is responsible for the insurance fee against fire and other damages, though, pending full payment of the purchase price, the silk remains the property of the filature. The firm is not allowed to use the silk as security to raise loans.

If a dispute arises in this connection, either the filature or the foreign firm often requests the Bureau of Inspection and Testing of

Commercial Commodities to test the quality of the silk so that a settlement may thereby be reached. If after testing the silk is found not up to standard, the foreign firm may cancel the contract or claim damage from the filature. If the silk is up to standard, the foreign firm then notifies the filature of the date on which the silk is to be once more submitted to the Bureau for conditioned weight test, which forms the final step in determining the weight of the silk. On receipt of the silk for conditioned weight test, the Bureau officials first find out the gross weight, the tare and the net weight of the silk. If the silk requires to be dried, two samples of about 450 grams each of raw silk are taken, weighed in a very sensitive scale and dried by gas or electricity. The taking of samples is very carefully done. About 40 per cent of the silk submitted for test is taken out from the whole lot and then a skein is taken from every package contained in that 40 per cent of raw silk referred to. Four or five such skeins are put together to form one sample. When the samples are dried to a certain degree, they are wrapped, sealed and returned to the applicant with a certificate in which the gross weight, tare, net weight, dry weight and conditioned weight are stated. The conditioned weight is calculated by adding 11% to the dry weight.

Foreign exporters classify Chinese steam filature silk into seven grades: Grand Double Extra, Double Extra, Extra A, Extra B, Extra C, Good A and Good B. The bulk of the Shanghai filatures' output is classified under the grades of Extra A and Extra B, though a fairly large quantity comes under the category of Double Extra and a limited quantity of Grand Double Extra.

(iv) Packing of the Cargo

Raw silk is always repacked before loading for shipment abroad. The cargo is sold by the producers to the foreign export firms in bales or packages varying in weight according to the custom of the producers or of the producing districts. It is generally packed in cotton cloth bags of about 1,000 ounces each. A bag contains 20 hanks of 50-60 ounces each, tied at both ends with silken cords. The repacking is done in the godown under the direction of the foreign firm's *sze lou* into bales of 100 catties net each. (The weight adopted in this connection is the Sze Ma Ping 司馬秤, each catty being equivalent to 16.8 ounces). After the loading of the cargo for shipment abroad,

the *sze hao* on the next day would send a representative to the foreign firm to collect the purchase price, which is usually paid by the firm after deducting the charges for repacking and for testing. On receipt of the payment, the *sze hao* hands over the money to the filature after deducting the commission for itself.

When the foreign firm finds the quality of the silk delivered by the filature not entirely satisfactory and fears that the cargo may be rejected by the foreign buyer when shipped abroad, it generally demands a reduction of the price or at least requires the filature to furnish a guarantee, which is in the form of either a money deposit or a written statement. In the former case, the filature deposits a certain amount of money with the firm together with a signed document, and the firm issues a receipt therefor. In the latter case, the filature issues to the firm a written guarantee, in which the amount of money to be paid by the filature as forfeiture is stated. A person, subject to the approval of the firm, is nominated as the guarantor. Although for the time being no money is paid to the firm, yet the guarantor is fully responsible for payment of a forfeiture, if any, afterwards. In both cases the name of the ship on which the silk is loaded, the date of loading, the number of bales, the marks on the bales, the brand, the grade and the denier of the silk, and other particulars guaranteed and the period during which the guarantee is effective are set forth in the written statement and the same details are also stated in the receipt issued by the foreign firm.

The period during which the guarantee is effective is generally limited to five months, dating from the day of loading. If the foreign buyer finds the cargo below standard and demands a forfeiture, he would wire the foreign firm, which in turn notifies the filature to this effect. On receipt of all the documents including the bills and certificates issued by the testing Bureau in the buyer's country, which generally follow the telegraphic advices by mail, the foreign firm hands them over to the *sze hao* or the filature together with the letters or telegrams from the buyer demanding a forfeiture. After a careful study of all the documents, if the filature accedes to the demand, it will instruct the *sze hao* to negotiate with the comprador and the manager of the foreign firm to fix the amount of forfeiture, for which approval is always sought from the foreign buyer. If the filature considers the demand for forfeiture unreasonable, it often

submits the case to arbitration by members of the Silk Merchants' Guild or of the Silk Merchants' Association or applies to the testing bureau in the buyer's country for another test. The award so obtained is always accepted as final. If telegraphic advices demanding a forfeiture are received from the foreign buyer but no bills nor other documents arrive after six weeks, it is generally considered that the buyer has waived his claim and the filature may take back the deposit or the written guarantee on expiry of the stated period.

(v) Testing of Silk for Export

Formerly the testing of silk for export was done at the International Silk Testing House, which was a private organization maintained jointly by the Chinese Government and certain foreign interests, under the direction of foreign engineers. In 1929, however, the Ministry of Industry and Commerce established the Bureau of Inspection and Testing of Commercial Commodities to test and inspect various kinds of exports, such as silk, cotton, *tung* oil, animal products, etc. The various departments were organized on various dates, that for the testing of raw silk being organized in April, 1929. In October of the same year, the Bureau took over the International Testing House, and continued to test silk for export.

Tests performed by the Bureau on silk are of two kinds—quantity and quality tests. The former include net weight, conditioned weight, and boil-off tests, while the latter include tests of evenness, cleanliness, neatness, sizing, winding, strength, etc. Only the conditioned weight test is compulsory, and no raw silk is now permitted to pass through the Chinese Maritime Customs for export unless it is accompanied by an official export permit of the Bureau for conditioned weight. Also, no transaction in raw silk, purchase, sale or dealing in any other manner, for purposes of export, may be effected at Shanghai except on the basis of the conditioned weight determined by the Bureau. However, these rules do not apply to dupion silk, silk waste, foreign silk, silk samples not exceeding one bale each, and silk sent abroad as exhibits in expositions and fairs, or for scientific and other purposes which do not inure to profit. The way the conditioned weight test is performed has already been referred to in a foregoing paragraph.

The Bureau has been in existence for about four years. Its usefulness is now well recognized. The various department heads are mostly American returned students, and their assistants graduates of colleges at home. A monthly magazine is published by the Bureau in Chinese, known as the *Foreign Trade Guide*, and another in English entitled *Export Inspection Bulletin*, now changed to *Inspection and Commerce*. In these publications, especially the former, much useful information and statistical data may be found, which we have not hesitated to make use of in the present report.

APPENDIX A

FILATURES COVERED BY THE SURVEYS OF 1931 AND 1932

Address	No. of Reels	1931	Name or Condition of Filature 1932	Before 1931
Section I				
1 Wuchow Road	208	Yuchin (裕綫)	Yichang No. 3 (怡昌三廠)	Est. 1924
1 Wuchow Road	208	Tungwei (通緯)	Yichang No. 2 (怡昌二廠)	Est. 1924
2 Wuchow Road	238	Yichang (C) (怡昌)	Yichang (怡昌)	Reorg. 1932
Section II				
52 Changchiahang Road	472	Tienchang (天星)	(C)	
108 Changchiahang Road	208	Weiyu (緯餘)	Yichang No. 5 (怡昌五廠)	Est. 1926
108 Changchiahang Road	208	Houfu (厚福)	Yichang No. 4 (怡昌四廠)	Est. 1925
3 Szechanglung, Chuanchiaan Road	200	Chenhsin (振興)	(C)	Est. 1931
7 Chuanchiaan Road	144	Sinlun (D) (新綫)	(C)	Yuanlun, 1931 (元綫)
605 Tienpao Road	168	Liho (C) (禮和)	Hsinlun (興綫)	Reorg. 1932
558 Tienpao Road	140	Fulun (D) (福綫)	Fulunheng (216) (福綫恆)	Est. 1928
230 Tienpao Road	240	Kungyi (公益)	(C)	Est. 1928
Shahung Road	240	Chenyi (振益)	Dismantled	Est. 1929
1 Tientungli, Dixwell Road	344	Yuanfeng (元豐)	Yuanfenjen (元豐仁)	Tungfenyung (圓豐永)
109 Tientung Road	264	Chiangchen (祥成)	Chiangchenho (祥成和)	Est. 1929
62 Tientung Road	216	Yunchenkung (雲成公)	Yunchenkung (雲成公)	Est. 1929
28 Passage 701, Paoshan Road	208	Chenyu (振餘)	Destroyed	Est. 1930
28 Passage 701, Paoshan Road	256	Chinchiang (慶祥)	Destroyed	Est. 1930
2 Passage 125, Hsiangyenchiao Rd.	318	Tungyi (統益)	Yifengshen (義豐盛)	Est. 1911

(D) Filatures reeling silk from *shwangkung* or dupcion cocoons only. (C) Closed.

Notes:—Figure after name of filature indicates the present number of reels operated. Date after name of filature in the last column indicates the date when the filature was reorganized and came under the new firm mentioned in 1931 column.

Address	No. of Reels	Name or Condition of Filature		Before 1931
		1931	1932	
Kunghsinchiao	344	Hunclunshun (D) (福輪順)	Partly destroyed	Shunkee, 1928 (順記)
718 Tientungan Road	240	Chintai (晉泰)	Partly destroyed	Est. 1928
718 Tientungan Road	160	Chenho (鎮和)	Partly destroyed	Est. 1930
12 Sinlunli, Hwangpang Road	240	Hsinlun (興輪)	Partly destroyed	Est. 1928
516 Hwangpang Road	226	Yufeng (豫豐)	Partly destroyed	Est. 1922
235 Chungshan Road	160	Juilun (D) (瑞輪)	Destroyed	Est. 1928
600 Paochang Road	200	Yinyu (盈餘)	Partly destroyed	Yinyu, 1931 (盈餘)
Section III				
779 Changan Road	208	Yuanyuan (C) (元元)	Chiangyuan (祥源)	
779 Changan Road	208	Lungkee (C) (隆記)	Hsiehkee (錫記)	Futa (復大)
Changan Road	208	Chunmei (春美)	(C)	Chiushen, 1929 (久慎)
Changan Road	296	Yungyuan (永源)	(C)	Est. 1928
Changan Road	276	Tailaichang (泰來昌)	(C)	Tailai, 1930 (泰來)
Changan Road	260	Chinfeng (慶豐)	(C)	Chiutai, 1925 (久壽)
351 Changan Road	240	Fuchangjun (福昌潤)	Tungchangtai (同昌泰)	Chichangtai, 1930 (啓昌泰)
351 Changan Road	240	Juifengyu (瑞豐餘)	Tungchangtai (同昌泰)	Juifeng, 1929 (瑞豐)
10 Changanli, Changan Road	432	Shunfeng (C) (順豐)	Chengtai (成泰)	
225 Changan Road	160	Hsienhsin (協興)	(C)	Yichangkung, 1929 (益昌公)
Changan Road	168	Hsiehchang (錫昌)	(C)	Hungchiang, 1925
530 Changan Road (or Heng-feng Road)	240	Chichang (其昌)	Tunghsin (東興)	Tachen, 1930 (大成)
246 Hengfeng Road (or Changan Road)	208	Fuchangtai (福昌泰)	(C)	Hsuchangshen, 1930 (緒昌慎)
246 Hengfeng Road (or Changan Road)	208	Hengchangsin (恆昌新)	(C)	

Address	No. of Reels	Name or Condition of Filature		
		1931	1932	Before 1931
238 Hengfeng Road (or Changan Road)	208	Fumin (福民)	(C)	Hsuehchangfu, 1930 (福昌福)
246 Hengfeng Road (or Changan Road)	208	Tingchangshun (鼎昌順)	(C)	Est. 1930
85 Hengfeng Road (or Changan Road)	224	Hengkang (衡康)	Yuanho (源和)	Tingyi, 1928 (鼎義)
85 Hengfeng Road (or Changan Road)	224	Hsiehfengho (協豐和)	Yuanho (源和)	Hsiehfeng, 1930 (協豐)
37 Hengfeng Road (or Changan Road)	184	Fussu No. 2 (福司二廠)	Tingkee (鼎記)	Possu No. 2, 1930, Fumin No. 2 (百司二廠福民二廠)
46 Yutung Road	240	Polun (寶輪)	Yuankee (源記)	Reorg. 1929
46 Yutung Road	240	Tingkung (鼎康)	Yuankee (源記)	Reorg. 1929
331 Kungho Road	248	Tienlai (天來)	Juiho (瑞和)	
330 South Meiyuan Road	240	Chinyuan (晉源)	Chiufentin (久豐鼎)	Chichangyung, 1930 (啓昌永)
330 South Meiyuan Road	260	Yungan (永安)	Hsiatai (洽泰)	Hsuehchangyung, 1930 (結昌永)
1794 Chungsin Road	162	Chiufeng (久豐)	Kungkee (公記)	Est. 1929
1794 Chungsin Road	160	Chiukang (久康)	(C)	Est. 1930
145 Kuochin Road	180	(C)	Yuyauncheng (裕源成)	
20 New Kungho Road	228	Chusin (C) (楚信)	Hokee (和記)	
1421 New Kungho Road	216	Sincheng (C) (信成)	Sinchengsin (信成新)	
Pengpuchiaio, Hutai Road	208	Lichang (利昌)	Fuchang (復昌)	Est. 1929
Pengpuchiaio, Hutai Road	208	Tienlun (天輪)	Fuchang (復昌)	Est. 1929
Tayangchiaio, Chapei	416	Fengtai (豐泰)	Fengtaishen (豐泰慎)	Est. 1926
8 Liuyin Road	144	Hengta (C) (恒太)	Hengyu (恆裕)	
71 Tanchiachiao	360	Yinfengshun (盈豐順)	Tata (240) (大達)	Est. 1928
Tantzewan, Chapei	200	Yungchang (永昌)	Juifengyu (瑞豐裕)	Est. 1927
38 Chengchiamuchiaio	288	Hsinyuanlung (鑫源隆)	(C)	Est. 1929
479 Kwangfu Road	272	Chiuta (C) (久太)	Jenchang (180) (仁昌)	

<i>Address</i>	<i>No. of Reels</i>	<i>Name or Condition of Filature 1931</i>	<i>Name or Condition of Filature 1932</i>	<i>Before 1931</i>
785 Kwangfu Road	230	Hsiehankung (協安公)	Chiatai (嘉泰)	Hsiehan, 1926 (協安)
801 Kwangfu Road	214	Hwachinshun (華慶順)	Chenhsin (240) (振興)	Est. 1929
1 Passage 659, Kwangfu Road.	208	Fussu No. 1 (福司一廠)	(C)	Possufu, 1930 (百司福)
Section IV				
32 Connaught Road	200	Yichangkung (益昌公)	Dismantled	Yichang, 1929 (益昌)
32 Connaught Road	228	Yunglun (永綸)	Dismantled	Est. 1926
5 Markham Road	512	Tingyuan (鼎沅)	Dismantled	Est. 1929
161 Jessfield Road	536	Sinchang (信昌)	Sinchang (信昌)	Est. 1924
Section VI*				
Lunghwachen	322	Jihsin (日新)	Paotai No. 2 (寶泰二廠)	Est. 1930
Section VII				
25 Miller Road	536	Juiluntai (瑞綸泰)	Dismantled	Est. 1930
15 Chengtu Road	208	Shenhsinyin (慎興盈)	Dismantled	Est. 1922
1037 Chengtu Road	508	(Ewo)**	Yihochinkee (怡和靜記)	
47 Alabaster Road	240	Hsiachenmao (洽成茂)	Chinwei (經緯)	Est. 1930
47 Alabaster Road	240	Lifeng (利豐)	Lifeng (利豐)	Est. 1929
6 Alabaster Road	280	Lunyuan (綸元)	Lunyuan (綸元)	Sunyuan. Hsinkee, 1930 (姓源, 鑫記)
11 Alabaster Road	186	Hsukang (C) (緒康)	Lunyuan No. 2 (綸元二廠)	
11 North Soochow Road	192	Hsuhsin (緒興)	Hsuhsiang (緒祥)	
88 Kansu Road	234	Hsiangfeng (祥豐)	Hsiangfeng (祥豐)	Yungfen-hsin, 1931 (永豐興)

*No filatures were located in Section V.

**This filature, being under foreign management in 1931, was not covered by our survey in that year. It was not until 1932 when it was taken over by the Chinese compradore of the foreign firm that we were able to collect the necessary data.

<i>Address</i>	<i>No. of Reels</i>	<i>1931</i>	<i>Name or Condition of Filature 1932</i>	<i>Before 1931</i>
Section VIII				
153 Jihhwei East Road	628	Potai (寶泰)	Dismantled	Chiucheng No. 3, 1929 (久成三廠)
1080 Hsiahsu Road	416	Kwangyuan (廣源)	Kwangyuanchin (232) (廣源動)	Chiucheng No. 4, 1929 (久成四廠)
1006 Hsiahsu Road	416	Chiucheng No. 2 (久成二廠)	Paotashun (208) (寶泰順)	Est. 1919
1176 Hsiahsu Road	208	Tungyi (同益)	Tungyi (同益)	Est. 1929

Total number of filatures covered by the 1931 survey, 70; reels 18,326. (Excluding dupion filatures, 66 and 17,238).

Total number of filatures covered by the 1932 survey, 46; reels 12,262. (Excluding dupion filatures, 45 and 12,046).

Filatures not operating during the surveys are not included, although their names appear in this list (those marked C).

APPENDIX B
 PRICE OF WUSIH DRY COCOONS*
 (WHITE SPRING COCOONS)
 (per picul)

	1926	1927	1928	1929	1930	1931	1932
January	140.000	148.000	142.000	142.500	152.500	125.000	90.000
February	142.000	145.000	140.000	142.500	152.000	140.000*	85.000
March	145.000	142.000	138.000	140.000	160.000	150.000*	83.000
April	147.000	150.000	135.000	140.000	170.000	140.000	68.000
May	150.000	153.000	140.000	136.000	156.000	124.000	69.000
June	155.000	152.000	130.000	142.500	160.000	150.000	60.000
July	158.000	147.000	132.500	156.500	165.000	140.000	60.000
August	160.000	151.000	125.000	159.000	150.000	135.000	70.000
September	155.000	146.000	126.000	167.500	145.000	130.000	82.000
October	150.000	145.000	165.000	182.500	140.000	120.000	83.000
November	153.000	140.000	152.500	173.000	137.000	110.000	86.000
December	150.000	140.000	149.000	157.500	115.000	100.000	77.000

*Data supplied by the National Tariff Commission, being commodity No. 117 in its unpublished records.

**These quotations are estimates made by the Commission, because, due to the Japanese invasion of Shanghai, no actual investigation could be made.

APPENDIX C
PRICE OF WHITE SILK WASTE*
(STEAM FILATURE CHANGTU, WITHOUT COVER)
(per picul)

	1925	1926	1927	1928	1929	1930	1931	1932
Jan.		190.000	240.500	131.750	170.000	177.500	152.000	145.000
Feb.		195.000	210.000	140.000	171.500	180.000	185.000	**135.000
Mar.		200.000	202.500	140.000	174.000	190.000	186.000	**125.000
April		200.000	203.000	143.500	171.500	190.000	180.000	123.000
May		205.000	195.000	142.000	169.000	178.000	173.000	124.000
June		210.000	185.000	137.500	172.500	180.000	166.000	90.000
July		220.000	172.500	141.000	178.000	175.000	160.000	84.000
Aug.		225.000	139.500	140.000	181.500	170.000	185.000	82.000
Sept.		230.000	136.750	147.000	184.000	150.000	190.000	125.000
Oct.	248.000	230.000	149.500	168.000	190.000	130.000	170.000	122.000
Nov.	249.000	235.000	139.000	162.500	186.500	134.000	145.000	115.000
Dec.	245.000	238.000	132.250	165.000	167.500	136.000	150.000	130.000

*Data supplied by the National Tariff Commission, being Commodity No. 118 in its unpublished records.

**These quotations are estimates made by the Commission because, due to the Japanese invasion of Shanghai, no actual investigation could be made.

APPENDIX D

LIST OF FOREIGN FIRMS IN SHANGHAI ENGAGED IN RAW SILK EXPORT BUSINESS

<i>Name</i>	<i>Address</i>	<i>Nationality</i>
Abdoolally, Ebrahim & Co.	229 Szechuen Road	
Arnhold & Co., Ltd.	Sassoon Building, Nanking Road	British
Azadian, Jacques, S. A.	4 French Bund	Indian
Azadian Leon	12 Rue du Consulat	
China Merts Pongee Association	36 Jinkee Road	Greek
Baer & Co., A.	17 Yuen Ming Yuen Road	Swiss
Burkhardt, Buchan & Co.	19 Canton Road	
Burkill & Sons, A. R.	2 Canton Road	British
Caristo Freres	12 Rue du Consulat	
Carlowitz & Co.	223 Szechuen Road	German
Cathay Products Suppliers	87 Yates Road	
Chapeaux, Etab., S. A.	4 French Bund	French
Clerici, Bedoni & Co., S. A.	17 Museum Road	Italian
Godsi, J.	5 Foochow Road	
Weber & Co., C. A.	10 Rue du Consulat	British
Chinai & Co., J. C.	10 Rue du Consulat	British
Lachard Follet & Cie	39a Canton Road	French
La Generale Soies	452 Kiangsi Road	French
Lang & Co., Robert	31 Szechuen Road	American
Little & Co., Wm.	21 Jinkee Road	
Madier, Ribet & Cie	9 Avenue Edward VII.	French
Marthoud & Cie	5 Foochow Road	French
Mitsui Bussan Kaisha, Ltd.	49 Szechuen Road	Japanese
Muguet, R.	9 Avenue Edward VII.	
C. D'Exportation	39a Canton Road	
Olivier-Chine	15 Yuen Ming Yuen Road	French
Umriga Bros.	64 Peking Road	
Higuchi & Co.	637a Nanzin Road	
Pila & Co., Les Succ d'Ulyse	49 Peking Road	French
Puthod, A.	7 Yuen Ming Yuen Road	
Ragi & Co., R. H.	39 Peking	British
Reiss, Massey & Co., Ltd.	15 Museum Road	British
Rudolph & Co., Chor Les	43 Peking Road	Swiss
Sauvayre, J.	3 Kiukiang Road	French
Gibb, Livingstone & Co., Ltd.	28 Jinkee Road	British
Gobhai Karanjia	147 Kiangsi Road	
Patal & Co., A. C.	12 The Bund	British
Paturel, C.	3 Kiukiang Road	French
Dell' Oro & Co.	1 Canton Road	
Dyce & Co.	18 Kiukiang Road	Italian
Eastern Trading Co.	3 Hankow Road	British
Equitable Trading Co.	25 Rue du Consulat	
Erzinger & Co.	18 The Bund	British
Gerli & Co., E.	24 Yuen Ming Yuen Road	American
Huber & Co., E.	49 Peking Road	American
Jardine, Matheson & Co., Ltd.	27 The Bund	British
Kermani & Co., R. S.	10 Hankow Road	French
China United Filling Export Co.	96 Peking Road	
China Silk Co., Ltd.	21 Yuen Ming Yuen Road	French
Heffer & Co., F. C.	452 Kiangsi Road	British

Note:—Before the present depression, four Chinese export companies, the Tonying, the Hu Lin, the Wei Cheng and Hwa Tung Companies also had a share of the raw silk export business. At present only the Tonying Silk Trading Co. is operating, the rest having since closed.

APPENDIX E

SILK BRANDS

The following table shows the grade into which the different brands of Chinese raw silk are classified by foreign exporters and also the name and address of the filatures producing the silk:—

<i>Grade</i>	<i>Brand</i>	<i>Name of Producer</i>	<i>Address of Producer</i>	<i>Remarks</i>	
1st	"Double Gold Deer"	Yung Tai	Tsechokiao, South Gate, Wusih.		
	"Co-operation"	Siaoshan Co-operative Filature	Haiyen		
	"Kitten"	Wei Cheng	Hsiashihtangyang, Hangchow.		
	"Purple Dragon"	Hangchow Filature	Hangchow.		
	"Factory"	Hsin Chang	161 Jessfield Road, Shanghai.		
	"Stork," Gold, Silver & Red	Ta Lun	Tanghsi, Hangchow.		
	"Bridge"	Tsatlee Model Filature	Nanzin, Huchow.		
	2nd	"Charming Tower"	Hou Sun	Tangweichen, Outside North Gate, Kashing.	
		"Five Gold Bats"	Ming Feng Model Filature	Yaochwangpang, Outside South Gate, Wusih.	
		"Gold Globe"	Yung Tai	Tsechokiao, South Gate, Wusih.	
		"K. L. Gold K. L."	Kung Li	Sinshih.	
		"Sun Stork"	Tung Feng Yung	Tien Tung Li, Dixwell Road, Shanghai.	
		"Sun & Phoenix"	Kung Li	Sinshih.	
		"Three Bridges"	Hou Sun	Tangweichen, Outside North Gate, Kashing.	
"Bayard"		Hsu Chang Shun	Changan Road, Chapei, Shanghai.		
"Double Gold Eagle & Bell"		Mei Heng Yu	Nansha, Nanzi, Huchow.		
"Double Stork"		Chung Yu	Shihhweikiao, Tangsi, Hangchow.		
"Five Storks"	Sianglun	Tangsi, Hangchow.			
"Flying Pagoda"	Tsatlee Filature	Nanzin, Huchow.			
"G. S."	Ching Sin	Wukiaokong, Shwangling, Huchow.			

<i>Grade</i>	<i>Brand</i>	<i>Name of Producer</i>	<i>Address of Producer</i>	<i>Remarks</i>
	"Gold Flying Stork" "M. D."	Hwa Lun Tung Yih	Tangsi, Hangchow. 32 Shangyenkiaio Road, Shanghai.	
	"N. Z."	Nanzin Tsatlee Filature	Fangshangkong, Nanzin, Huchow.	
	"Stage"	Chien Sun	Kungyingkiaio, Wusih.	
	"Santa Claus"	Yuan Kong	Hwangputun, Wusih.	
3rd	"A"	Ching Cheng	Puanchieh, Hangchow.	
	"K. L. Black K. L."	Kung Li	Sinshih	
	"C. M. D."	Li Lung	Hsifengyang	
	"Longevity"	Ching Cheng	Puanchieh, Hangchow.	
	"New World"	Ming Feng Model Filature	Yaochwangpang, Wusih.	
	"Peace"	Ming Feng Model Filature	Yaochwangpang, Wusih.	
	"Sailing Boat"	Tsatlee Model Filature	Fanshankong, Nanzin, Huchow.	
	"Camel"	Sheng Feng	Tingtsekiaio, Wusih.	
	"Double Eagle"	Cheng Yi	Tsingmingkiaio, Wusih.	
	"Gold Double Leopard"	Feng Tai	Pingkiaotu, Pengpu, Paoshan.	
	"Moon Rabbit"	Yung Tai	Tsetsokiao, Wusih.	
	"Rice Plant"	Hou Sun	Tangweichen, Kashing.	
	"Seven Stars"	Yuan Kong Sun	Hwangputun, Wusih.	
	"Single Deer"	Yung Tai	Tsetsokiao, Wusih.	
	"Snow Hill & Pagoda"	Yu Chang	Chowsinchen, Wusih.	
	"Three Dancers"	Chien Sun	Kunyingkiaio, Wusih.	
	"W. T. K."	Yih An	63 Kwangfu Road, Chapei, Shanghai.	Temporarily suspended
	"Yah Fong"	Yih Feng	Hengfeng Road, Chapei, Shanghai.	
	"Blue Eagle & Globe"	Mei Heng Yu	Nanzin, Huchow.	
	"Civa"	Wei Cheng	Hsiashihtangyang, Hangchow.	
	"Double Magpie"	Yuan Yih	Kwangching Road, Wusih.	
	"Double Tiger"	Yih Chang	225 Changan Road, Chapei, Shanghai.	Temporarily suspended
	"Double Pigeon"	Ta Lun Co.	Jukong Road, Shanghai.	

<i>Grade</i>	<i>Brand</i>	<i>Name of Producer</i>	<i>Address of Producer</i>	<i>Remarks</i>
	"Double Black Tiger"	Tien Cheng	Peisngkiao, Wusih.	
	"Five Bats"	Yuan Feng	Tienpao Road, Shanghai.	
	"Gold Eagle & Flag"	Yuan Feng	Nantang, Wusih.	
	"Gold Buffalo"	Sin Lun	Yuchichen, Wusih.	
	"Gold Five Dragon"	Siu Lun	Wulungkiao, Kashing.	
	"Gold Eagle Bell"	Yu Ching	1, Wuchow Road, Shanghai.	
	"Maple"	Chien Feng	Yehfangchang, Wusih.	
	"Jeay Sung"	Chien Sun	Kungyingkiao, Wusih.	
	"Matchlessness"	Hung Shun	Manchuria Road, Shanghai.	
	"Red Flag"	Tung Yih	1176 Siehsu Road, Shanghai.	Temporarily suspended
	"Two Dancers"	Ching Sin	Wukiaokong, Shwanglin, Huchow.	
	"The Greater Shanghai"	Cheng Lun	Luchwang, Wusih.	
	"West Lake"	Tien Chang	Linszehou, Hangchow.	
4th	"Pioneer"	Chang An Filature	Changan, Haining.	
	"Standard"	Chang An Filature	Changan, Haining.	
	"Ceres"	Teh Ta Yu	Chowshanpang, Wusih.	
	"Chen Doong Fu"	Yi Feng	Tingtsekiao, Wusih.	
	"Discobolus"	Lung Kee	Changan Road, Shanghai.	
	"Double Hill"	Shwang Shan	Siashih, Haining.	
	"Double Pheasant"	Lun Siang	15 Tang Ka Lung, Shanghai.	
	"Lake & Hill"	Nanzin Tsatlee Filature	Fangshangyang, Nanzin, Huchow.	
	"A Gold A"	Tien Chang	511 Changkayang Road, Shanghai.	Temporarily suspended
	"Gold Champion"	Siang Ho	3 Chukaan Road, Shanghai.	
	"Great China"	Sheng Feng	Tingtsekiao, Wusih.	
	"Mulberry Tree Yard"	Chiu Cheng	Lijihhweikiao, Shanghai.	
	"Peace"	Yuan Feng	Tienpao Road, Shanghai.	Temporarily suspended
	"Progress"	Cheng Feng	Tingtsekiao, Wusih.	
	"Race"	Sheng Feng	Tingtsekiao, Wusih.	
	"Robin Hood"	Pao Tai	20 Jihhweikiao, Shanghai.	
	"Sailing Boat"	Chinese Tsatlee Filature	Tsili, Huchow.	
	"Sun Fish"	Tai Fu	Tatanghsia, Wusih.	
	"The Gold Cup"	Tai Fu	Tatanghsia, Wusih.	

<i>Grade</i>	<i>Brand</i>	<i>Name of Producer</i>	<i>Address of Producer</i>	<i>Remarks</i>
	"Bamboo Grove"	Lung Kee	799 Changan Road, Shanghai.	Temporarily suspended
	"Chue Dah"	Chiu Ta	Changan Road, Shanghai.	Temporarily suspended
	"Double Eagle & Globe"	Pao Ching	Winchester Road, Shanghai.	
	"D. S."	Ta Sheng	Tashengkiao, Liuying Road, Shanghai.	
	"Double Zero"	Yu Chang	Chowsinchwan, Wusih.	
	"Eagle & Tripod"	Ting Yuan	5 Markham Road, Shanghai.	Temporarily suspended
	"Green Battleship"	Tung Wei	1 Wuchow Road, Shanghai.	
	"Giraffe"	Jui Feng	Ninglungkiao, Wusih.	
	"Green Dragon"	Ta Lun	Jukong Road, Shanghai.	
	"Kingfisher"	Chien Feng	Yehfangchang, Wusih.	
	"Kwang Ing Buddha"	Lun Ta	51 N. Soochow Road, Shanghai.	
	"Kun Jih"	Kung Yih	Tienpao Road, Shanghai.	
	"Lucky Stick"	Yih Chang	225 Changan Road, Shanghai.	Temporarily suspended
	"Mulberry Tree"	Ching Tai	Kotangkiao, Wusih.	
	"Sun Flower"	Lun Siang	15 Tangkalung, Shanghai.	
5th	"Blue Dragon"	Chiu Ta	Changan Road, Shanghai.	
	"C. S."	Teh Kong	116 Manchuria Road, Shanghai.	Temporarily suspended
	"C"	Heng Kong	Hengkong Road, Shanghai.	
	"Cock"	Yung Lun	Connaught Road, Shanghai.	
	"Cow Boy"	Siang Lun	15 Tangkalung, Shanghai.	
	"Dahlia"	Yung Lun	Connaught Road, Shanghai.	
	"D. L."	Ta Lun	Jukong, Road, Shanghai.	
	"Dee"	Yu Feng	Kukawan, Shanghai.	
	"F. L."	Chien Sun	Kungyingkiao, Wusih.	
	"Five Bees"	Yung Tai Shing	Tientungan Road, Shanghai.	
	"F. C."	Yuan Yuan	17 Changhan Road, Shanghai.	Temporarily suspended
	"Flying Eagle"	Shun Feng	Changan Road, Shanghai.	
	"Foot Ball"	An Yu	2 Wuchow Road, Shanghai.	
	"Geranium"	Lun Siang	15 Tangkalung, Shanghai.	

<i>Grade</i>	<i>Brand</i>	<i>Name of Producer</i>	<i>Address of Producer</i>	<i>Remarks</i>
	"Glinding Boat"	Chiu Tai	Changan Road, Shanghai.	
	"Gold Shanghai"	Hsin Cheng	Liuying Road, Shanghai.	Temporarily suspended
	"Gold Yunzen"	Hsin Cheng	Liuying Road, Shanghai.	Temporarily suspended
	"Griffin"	Hsuchangyung	Nanmeiyuan Road, Shanghai.	
	"Gold Pagoda"	Chiu Cheng	Lijihhweikiao, Shanghai.	
	"Good Chance"	Li Chi	Tehching.	
	"Jewel Stone Buddha"	Yuan Feng	Nantang, Wusih.	
	"New World"	Yuan Feng	Tienpao Road, Shanghai.	Temporarily suspended
	"Nan Zing Tower"	Tsatlee Model Filature	Tatungkiao, Huchow.	
	"Old Coin"	Yi Feng	Tiangtsekiao, Wusih.	
	"Orang Outang"	Tien Chang	511 Changkayang Road, Shanghai.	Temporarily suspended
	"Rising Sun"	Ching Cheng	Teikungkiao, Wusih.	
	"Pine & Moon"	Yih Chang	225 Changan Road, Shanghai.	Temporarily suspended
	"Red Stork"	Van Yih	Lihwachwang, Wusih.	
	"Red Buffalo"	Shing Lun	65 Shangyenkiao Road, Shanghai.	Temporarily suspended
	"S. L."	Shing Lun	65 Shangyenkiao Road, Shanghai	Temporarily suspended
	"Silver Bear"	Pa Sze Fu	55 Kwangfu Road, Shanghai.	Temporarily suspended
	"Sun Deer"	Ta Lun	Jukong Road, Shanghai.	
	"Seasonal Flower"	Hsu Kong	54 North Socchow Road, Shanghai.	
	"Tai Lai"	Tien Lai	Corner of Kungho & Heng- feng Roads, Shanghai.	
	"The Ability of Labor"	Pao Ching	Winchester Road, Shanghai.	
	"Tienzen"	Pao Sze Fu	55 Kwangfu Road, Shanghai.	Temporarily suspended
	"Wusih Park"	Jui Chang	Chow Shan Pang, Wusih.	
	"Wuchow Mountai"	Yu Ching	1 Wuchow Road, Shanghai.	
	"Y. F. F."	Yih Chang	Hengfeng Roads, Shanghai.	
	"Yuan Shi Kai"	Feng Tai Shun Kee	Pingkiangkiao, Pengpu, Paoshan,	

<i>Grade</i>	<i>Brand</i>	<i>Name of Producer</i>	<i>Address of Producer</i>	<i>Remarks</i>
6th	"Y. L."	Yu Lun	Tihsukiao, Wusih.	
	"Yue Chang"	Yi Chang	Taikakiao, Shanghai.	
	"Chin Chin"	Chju Tai	Changan Road, Shanghai.	
	"Fishing Boat"	Sun Yuan	60 N. Thibet Road, Shanghai.	
	"Gold Mulberry Leaves"	Yuan Yuan	17 Changan Road, Shanghai.	Temporarily suspended
	"Horse"	Tien Lai	Corner of Kungho & Hengfeng Road, Shanghai.	
	"N. C. C."	Tung Yih	23 Shangyenkiao, Shanghai.	
	"N. T. K."	Yih An	63 Kwangfu Road, Kungyinkiao, Wusih.	Temporarily suspended
	"Palm Tree"	Chien Sun		
	"Parrot & Grapes"	Teh Ta Yu	Chowshanpang, Wusih.	
	"S. S. S."	Pa Sze Fu	55 Kwangfu Road, Shanghai.	Temporarily suspended
7th	"Double Well"	Hsu Chang Sheng	Hengfeng Road, Shanghai.	
	"Eagle Stork"	Hsu Chang Yung	Nanmeiyuan Road, Shanghai.	
	"Fountain"	Yuan Yuan	17 Changan Road, Shanghai.	Temporarily suspended

APPENDIX F

REGULATIONS OF THE SHANGHAI BUREAU OF INSPECTION AND TESTING OF COMMERCIAL COMMODITIES, MINISTRY OF INDUSTRIES

Raw Silk Testing Department (Promulgated August 20, 1931)

- Art. I. The following regulations are drawn in accordance with the provisions made in Article II, Section III, and Article XXI of the Tentative Regulations for the Inspection and Testing of Exports.
- Art. II. Tests performed by the Raw Silk Testing Department of the Bureau shall be classified as follows:
1. *Quantity Test*: Conditioned Weight, Net Weight, and Boil-off.
 2. *Quality Test*: Evenness, Cleanness, Neatness, Sizing, Winding, Strength, Cohesion etc.
- Art. III. Raw silk exported through Shanghai shall in accordance with these regulations be submitted for conditioning to the Raw Silk Testing Department of the Shanghai Bureau of Inspection and Testing of Commercial Commodities. Raw Silk shall not be permitted to pass through the Chinese Maritime Customs unless it is accompanied by official export permit for conditioned weight. Quality tests and quantity tests other than conditioned weight test shall be at the option of the party applying for the tests.
- Art. IV. No transaction in raw silk, purchase, sale or dealing in any other manner for purposes of export may be effected at Shanghai except on the basis of the conditioned Weight determined by the Bureau.
- Art. V. These regulations shall not apply to the export of silk falling under the following items:
1. Export dupion and silk waste.
 2. Transactions in or export of silk which is not domestic product.
 3. Transactions in or export of silk to be used as samples, provided that the quantity thereof shall not be more than one bale.
 4. Transactions in or export of silk to be used as exhibits in exposition and fairs, as specimens, or for scientific and other purposes which are other than the acquisition of gain.
- In the case of Item 1, the fact that the package contains dupion or silk waste shall be indicated on the outside of the bale and/or package.
- Art. VI. The party applying for tests to the Raw Silk Testing Department of the Bureau shall submit to the officer in charge the official application form together with the goods to be tested, and also testing charges, for which an official receipt properly signed by the officer in charge shall be issued.
- Art. VII. Samples for test shall be taken officially by the Bureau. The applicant shall not designate any samples for test.
1. *Sampling for Conditioned Weight Test*: The number of bales sampled for conditioning shall be 40% of the total number of bales in a lot (fraction counted over). From each of the bales two samples of sufficient number of skeins to weight approximately 540 grams each shall be drawn, not more than one skien shall be taken from any one book.

2. *Sampling for Book-off Test*: Sampling shall be applied to at least 10% of the lot (fraction counted over). Ten skeins shall be drawn at random from the bale and a composite sample of 100 grams shall be taken for the test.

3. *Sampling for Quality Test (a) Sample for Bale*: The sample for a test on a bale shall consist of at least ten average original skeins, selected at random from different parts of the bale, not more than one skein to be drawn from any one book or bundle. Test samples for two or more different kinds of tests may be taken from the original ten skeins.

(b) Composite Sample for Lot: When it is necessary to make an exhaustive test a composite sample for a five or ten bale lot shall consist of at least four original skeins from each bale, selected at random from different parts of the bale; twenty skeins will represent a five bale lot, 40 skeins a ten bale lot, not more than one skein shall be drawn from one book or bundle and the entire number of skeins shall be treated as one sample. Test samples for two or more different kinds of tests may be taken from the original skeins.

Lots consisting of more than ten bales shall be divided into ten bale lots, including consecutive numbers; each ten bale lot or fraction thereof shall be sampled independently as described above. For lots of less than five bales twenty skeins shall be drawn equally distributed from all bales of the lot.

Art. VIII. Tests shall be performed in sequence in accordance with the order of applications received and shall be completed within fourteen (14) working hours from the time when the applications and materials are received.

Art. IX. The packing and unpacking of raw silk for the purpose of performing tests shall be done by the Bureau, and in case of necessity the Bureau may cause the applicant to be present.

Art. X. When the Raw Silk Testing Department completes the test, the original and duplicate certificates of the tests, and in the case of conditioned weight the official Export Permit, shall be delivered to him.

Art. XI. When tests are completed the applicant shall without delay take delivery of the silk and return the official receipt to the Raw Silk Testing Department. In case the applicant does not take delivery of the raw silk, the Raw Silk Testing Department of the Bureau shall return the silk to the applicant at the latter's expense.

Art. XII. Testing charges shall be collected according to the following schedule:

1. QUANTITY TEST.

Test No. A—Conditioned weight test.

(1) Steam Filatures, per bale \$ 2.00

(2) Tsatlees and Tussahs, per bale \$ 1.00

Test No. B—Net weight test with detailed tare per bale .. \$ 1.00

Test No. C—Boil-off test, 100 grams from 10 skeins .. \$ 2.00

2. QUALITY TEST.

Quality tests can be applied free of charge.

Storage—per bale for one month or fraction thereof .. \$.50

Art. XIII. These regulations shall take effect upon approval and promulgation by the Ministry of Industries.

APPENDIX G

INVESTIGATION SCHEDULE OF FACTORIES AND WORKSHOPS IN THE MUNICIPALITY OF GREATER SHANGHAI

1. NAME OF FACTORY
2. LOCATION
 - Location of factory
 - Location of business office
3. NAME OF OWNER OR MANAGER OF FACTORY
4. NATURE OF BUSINESS
5. DATE OF ESTABLISHMENT OR REORGANIZATION
6. NAME OF FACTORY BEFORE REORGANIZATION
7. BUSINESS ORGANIZATION
 - Single proprietorship
 - Partnership
 - Limited liability corporation
 - Unlimited liability corporation
 - Others (specify their nature)
 - (Mark out one.)
8. CAPITAL & RESERVE
 - Authorized capital
 - Paid-up capital
 - Percentage of foreign capital
 - a. Nationality } 1 } 2 } 3 } 4 } 5
 - b. Percentage } } } } }
 - Reserve
9. OFFICERS (Including Manager).
 - Number
 - Male Female.....
 - Monthly salary
 - drawn equally distributed from all bales of the lot.
 - Any bonus paid?
 - Total amount of salaries paid last year
10. WORKERS

Number:	Time work	Piece work
Male workers	_____	_____
Female workers	_____	_____
Child workers	_____	_____
Apprentices	_____	_____
Highest monthly wage:		
Male workers	_____	_____
Female workers	_____	_____
Child workers	_____	_____
Apprentices	_____	_____

Lowest monthly wage:-

Male workers	_____	_____
Female workers	_____	_____
Child workers	_____	_____
Apprentices	_____	_____

Any bonus paid?

Male workers	_____	_____
Female workers	_____	_____
Child workers	_____	_____
Apprentices	_____	_____

Total amount of wages paid last year

Number of workers required when factory is in full operation

11. WORKING PERIOD.

Months per year

Days per month

Hours per day (time for meals excluded)

from.....a.m. to.....a.m.

from.....p.m. to.....p.m.

12. ANY NIGHT SHIFT?

How many hours? (from.....p.m. to.....a.m.)

What wages paid?

Is there night shift every day?

How many workers doing night work?men,.....women,
.....children (including apprentices)

13. ARE MEALS SUPPLIED?

What charges per person per month?

14. ARE LODGINGS SUPPLIED?

What charges per person per month?

15. FACTORY BUILDING

Modern or old style

Number of buildings

Date of construction

Owned or rented

16. POWER

Kind of power	No. of engines	How many H.P. or K.W.
---------------	----------------	-----------------------

(1) Steam engine	_____	_____H.P.
------------------	-------	-----------

(2) Steam turbine	_____	_____H.P.
-------------------	-------	-----------

(3) Petrol engine	_____	_____H.P.
-------------------	-------	-----------

(4) Electric generator	_____	_____K.W.
------------------------	-------	-----------

(5) Electric motor	_____	_____H.P.
--------------------	-------	-----------

Made in what country?(1).....(2).....(3)

.....(4).....(5)

What company supplies the electric current?

17. PRINCIPAL MACHINES

	(1)	(2)	(3)	(4)	(5)
Name	_____	_____	_____	_____	_____
Number	_____	_____	_____	_____	_____
Brand	_____	_____	_____	_____	_____

Made in what
country? _____
Monthly productive
capacity (Refer-
ring to full capa-
city of machines
working day and
night) _____

18. RAW MATERIALS

	(1)	(2)	(3)	(4)	(5)
Name	_____	_____	_____	_____	_____
Principal sources of supply	_____	_____	_____	_____	_____
Buying and selling unit	_____	_____	_____	_____	_____
Quantity required per month by this factory	_____	_____	_____	_____	_____
Total estimated cost per month	_____	_____	_____	_____	_____

19. PRODUCTS

	(1)	(2)	(3)	(4)	(5)
Name	_____	_____	_____	_____	_____
Brand	_____	_____	_____	_____	_____
Principal markets	_____	_____	_____	_____	_____
Packing unit and weight per package	_____	_____	_____	_____	_____
Maximum production per year, month or day (Referring to full capacity of machines and machines and labour during the whole specified time)	_____	_____	_____	_____	_____
Actual production last year, month or day	_____	_____	_____	_____	_____
Estimated value last year, including value of products in stock	_____	_____	_____	_____	_____

20. REMARKS

.....

.....

Name of investigator

Filled on.....day.....month.....year.

ERRATA

<i>Page</i>	<i>Line</i>	<i>Column</i>	<i>Error</i>	<i>Correction</i>
iii	27		Number or reels	number of reels
1	2		old-fashioned	the old-fashioned
1	25		Chichang	the Chichang
1	30		Lunghwa	Lunhwa
3	10		increased demand	increased domestic demand
4	21		Statistical	Statistical
5	4 (table)	3	12,392	13,392
5	foot-note 1		Commercial	Commercial Com- modities
5	foot-note 2			add: The <i>Handbook</i> gives figures for all years from 1917 to 1932, but they differ very much from ours, and the source of information is not indicated. For instance, according to the <i>Handbook</i> , there were more filatures in 1932 than in any previous year and more reels than any year except 1931, while we know for certain that no new filatures were constructed in 1932 but many old ones were destroyed or dismantled. We take the 1927 figure from it at the last moment after we have failed to secure the data elsewhere, which explains why this figure is not shown in the chart on the next page.

Page	Line	Column	Error	Correction
7	6		Statistics	Statistics
8	foot-note 5		Commission.	omit the period
12	6-7		pros-pects	pros-pects
12	23		circumstances	circumstances
18	34		prices	pieces
19	10		have ben	have been
38	on top of table		*	omit
43	19 (table)	8	..	omit
66	Table XXIVa Total		20,973,101.00	20,973,101.60
81	16		611-616	411-616
92	2 (table)	5	11.28	11.35
93	17 (table)	7	— (Fileuses H)	3
93	20 (table)	1	13.00-18.49	13.00-18.49
94	1 (table)	7	3 (Fileuses H)	omit
100	Table XL heading		Filatures No. of	No. of Filatures
104	11, 15, 19 & 23		1.65	16.5
107	8 (table)	2	\$1.90	omit
107	11 (table)	1	Changan	omit
107	11 (table)	2	\$1.00	omit
107	17		way Administration	Administration
110	column 1 heading		Quantity (piculs)	Quantity (catties)
123	12 (table)	2	140 Fulun	440 Fulun
123	foot-note D		duplion	dupion
124	21 (table)	1	530 Changan Road (or Hengfeng Road)	530 Changan Road (or 1 Hengfeng Road)
126	17 (table)	4-5	Lifeng, Est. 1929	Lifeng, Est. 1926
128	2,3	7	*	omit
128	2,3	8		add ** before data of February and March, 1932
140	27 under 9. Officers		drawn equally distributed from all bales of the lot	omit
142	32 under 19. Products		machines and	omit

Note—The lines are counted without including the tables, but they do include the headings of the written report. In case of errors in the tables, only the lines in the body of the tables are counted, excluding all the headings.