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# HOSIERY KNITTING IN TIENTSIN

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## **PREFACE**

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This report, which sums up the results of the Committee's investigation into the knitting industry in Tientsin, is similarly treated like the previous reports by the present writer on the "Tientsin Carpet Industry" and the "Rayon and Cotton Weaving in Tientsin". It will soon be followed by other reports of the same nature on two more industries in Tientsin, namely, cotton spinning and weaving, and flour milling.

I wish to take this opportunity of acknowledging my indebtedness to all those who have helped one way or the other towards the completion of this study. Like the other studies on Tientsin industries, this one too is largely financed by a grant from the Institute of Pacific Relations, and suggested by Dr. Franklin L. Ho, Director of the Committee who has besides contributed valuable criticisms. The field investigation is undertaken by Mr. Y. C. Hang, and the statistical computation by Mr. T. Y. Lee.

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December, 1930

## Chapter I. History and Localization

### History

The introduction of hosiery into China may be dated back to the early part of the nineteenth century, but its enumeration in the Customs returns did not begin until 1879. In that year there were imported into Shanghai Hk. Tls. 1,149 worth of hose and into Canton Hk. Tls. 3,701 worth of glove. Five years later, in 1884, a new item, hosiery, was enumerated for the port of Canton in addition to glove; it was valued at Hk. Tls. 4,451. The combined total for these three kinds of hosiery, meantime, was increased to Hk. Tls. 8,259. The enumeration, however, was still confined to the two ports of Shanghai and Canton; it was not extended to other ports until 1898. In that year, figures on hosiery were enumerated for Newchang, besides Shanghai and Canton. Four years again elapsed before these three kinds of hosiery were merged into one category, namely, hosiery, and a summary table for all ports, instead of a separate table for each port, was given in the Customs returns. In that year, 1902, the import of hosiery increased from the small total of Hk. Tls. 4,850 in 1879 to the huge one of Hk. Tls. 262,429,—an increase of 53 times. This increase, of course, was exaggerated, because of the Customs' failure to enumerate completely for the earlier years, but at any rate it showed a remarkable advance in the consumption of hosiery by the Chinese people. Since 1902 statistics on the quantity of hosiery imported have been given alongside those on value, thereby furnishing an index of increasing consumption not affected by the changes in the purchasing power of money. From 1902 to 1913, the last pre-war year, the quantity of hosiery imported increased 8.5-fold, whereas its value increased 7.3-fold. In view of a rise in the wholesale price index from 96.9 in 1902 to 100 in 1913 according to the index compiled by Mr. C. Y. Tang,<sup>1</sup> this discrepancy of increase between quantity and value of imported hosiery can only be explained by a change in the quality involved. In fact, it is but natural that such a decline in quality, from silk to cotton or woolen hosiery, should have been feasible in the course of more than a decade, as the Chinese people at large, not the wealthy few, became more used to the comfort and nicety of imported hosiery, and preferred it to the socks and stockings made of cotton cloth. After 1913 the war brought immediate effects to bear upon the import of hosiery into China. The value of imported hosiery dropped from Hk. Tls. 1,913,703 in 1913 to Hk. Tls. 1,373,791 in 1914, and to Hk. Tls. 922,955 in 1915, despite an increasing price index of commodities at wholesale from 67.18 in 1913 to 68.79 in 1915, according to the index compiled by this Committee.<sup>2</sup> A recovery, however, was made in the following two years,

1. Nankai University Committee on Social and Economic Research, *Wholesale Prices and Price Index Numbers in North China*, 1929, p. 131.
2. *Ibid*, p. 7.

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1916 and 1917, because of the efforts made by Japan to meet the Chinese demand left unsatisfied by other belligerent nations. During these two years, Japan's export of hosiery to China increased from Hk. Tls. 420,323 in 1915 to Hk. Tls. 1,250,046 in 1916, and to Hk. Tls. 1,848,754 in 1917. Meantime, Chinese manufacturers, especially those in industrial and commercial centers, seized this golden opportunity of European War to start the new industry of hosiery knitting, with protection afforded not by tariff autonomy, but by circumstantial absence of international competition. The import of hosiery into China, therefore, began to decline after 1917 with but a few exceptions. In 1929, the last year for which customs data are yet available, the import of hosiery amounted to a little over one third of that in 1917, decreasing from Hk. Tls. 2,696,668 in the latter year to Hk. Tls. 1,079,460 in the former. In quantity the decline was still greater, as the dozens of hosiery imported in 1929 did not amount to more than one sixth of those in 1917. This, however, is partly due to the rise of price level from 79.96 in 1917 to 111.08 in 1929,<sup>8</sup> but mainly due to the improvement in the quality of hosiery imported. During this interval of more than a decade, knitting factories and workshops have been established all over China, whose output, because of relative facility of production, has been confined chiefly to the cotton and woolen variety. Silk hosiery, which requires larger outlay in raw materials and machinery, is still imported from abroad. In Table 1, statistics on the net import of hosiery from 1879 to 1929 are given in value as well as in quantity. In Tables 2a and 2b, the sources of hosiery import into China and their relative importance, from 1902 to 1929, are shown. According to the last two tables it may be noted that in twenty-one out of the twenty-eight years under review, Hongkong, above all others, occupied the first place in the value of gross export of hosiery to China. Hongkong, however, is but a clearing port for goods coming into China from various European nations. Japan, after having displaced Germany during the War, occupied the second place for fourteen out of twenty-eight years, of which twelve second places were seized from Germany after the outbreak of the World War. Germany, having occupied second or third place before the War, went out of the race for hosiery export to China after it. Only in 1922 did she occupy the fourth place. Great Britain occupied the third place for thirteen years and the fourth place for eleven years. The United States, which did not occupy any of the first four places before the War, occupied one second place, seven third places and five fourth places after the outbreak of it.

8. *Nankai weekly statistical service*, Vol. III, No. 22, June 2, 1930.

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*CHAPTER I. HISTORY AND LOCALIZATION*

**Table 1. Net import of hosiery into China,  
1876-1929.**

Year	Dozens	Hk. Tls.	Year	Dozens*	Hk. Tls.
1879		4,850	1904	301,608	331,057
1880		5,296	1905	499,654	580,955
1881		7,304	1906	492,040	542,798
1882		5,877	1907	453,482	510,354
1883		7,175	1908	373,018	518,419
1884		8,259	1909	707,051	861,191
1885		15,575	1910	782,560	949,118
1886		12,414	1911	733,629	844,484
1887		28,521	1912	1,345,959	1,230,881
1888		15,857	1913	2,109,301	1,913,703
1889		15,187	1914	1,749,542	1,373,791
1890		19,666	1915	1,367,110	922,955
1891		22,633	1916	2,091,983	1,934,817
1892		5,196	1917	2,544,943	2,696,668
1893		54,146	1918	1,913,001	1,872,121
1894		57,317	1919	2,063,102	1,994,063
1895		56,484	1920	984,248	1,449,659
1896		89,855	1921	1,480,706	1,786,179
1897		82,973	1922	1,349,327	1,345,320
1898		89,581	1923	1,387,729	1,493,696
1899		116,008	1924	1,019,021	1,191,349
1900		133,770	1925	788,328	1,049,732
1901		208,543	1926	577,598	1,042,893
1902	249,315	262,429	1927	334,636	724,172
1903	139,972	145,838	1928	469,121	1,103,353
			1929	446,014	1,079,460

After 1919 hosiery is recorded in dozens as well as in piculs. For the sake of uniformity one picul is converted into 100 dozens.

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**Table 2a. Relative importance of foreign countries in the export  
of hosiery to China, 1902-1929**

(in percentages)

Year	Hongkong	Japan	Great Britain	U. S. A.	Germany	Other
1902	2(16.5)	4( 4.7)	3(16.4)			1(61.4)
1903	1(46.0)	4( 9.2)	3(18.3)			2(25.2)
1904	2(35.0)	4( 8.2)	3(10.9)			1(45.4)
1905	2(38.5)	4( 7.0)	3( 9.7)		1(42.5)	
1906	1(49.5)	4( 7.2)	3(11.1)		2(31.2)	
1907	1(41.8)	3(13.2)	4( 5.1)		2(37.3)	
1908	1(46.6)	3(19.7)	4( 3.9)		2(23.7)	
1909	1(39.8)	3(12.7)			2(33.4)	4( 5.7)
1910	1(42.0)	3(18.3)	4( 2.8)		2(29.7)	
1911	1(36.5)	2(27.9)	4( 4.6)		3(24.9)	
1912	1(34.8)	2(30.4)			3(20.6)	4( 6.1)
1913	2(28.3)	1(29.7)			3(25.4)	4(10.3)
1914	2(36.0)	1(39.5)			3(14.9)	4( 4.5)
1915	1(48.5)	2(44.4)	3( 2.9)	4( 1.7)		
1916	2(33.7)	1(61.9)	4( 1.6)	3( 2.2)		
1917	2(35.9)	1(60.5)	3( 1.2)			4( 1.1)
1918	1(52.1)	2(42.8)	4( 1.5)	3( 1.9)		
1919	1(47.9)	2(45.2)	4( 1.7)	3( 4.2)		
1920	1(59.4)	2(27.0)	4( 5.5)	3( 6.7)		
1921	1(70.9)	2(19.9)	3( 4.0)	4( 2.9)		
1922	1(83.0)	2(13.6)	3( 0.9)		4( 0.7)	
1923	1(82.4)	2(10.2)	4( 2.4)	3( 2.8)		
1924	1(79.7)	2(10.8)	3( 3.6)	4( 2.2)		
1925	1(68.3)	2(14.7)	3( 6.1)	4( 6.0)		
1926	1(46.0)	2(21.5)	4( 8.9)	3(14.4)		
1927	1(39.8)	2(35.0)	3( 9.9)	4( 7.9)		
1928	1(34.5)	2(26.1)	4(12.0)	3(18.9)		
1929	1(35.5)	4(16.7)	3(18.4)	2(21.4)		

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**Table 2b. Gross export of hosiery from foreign countries to  
China, 1902-1929 (in Haikwan Taels)**

Year	Hongkong	Japan	G. B.	U.S.A.	Germany	Other	Total
1902	43,770	12,439	43,358	2,382		162,452	264,401
1908	68,265	13,683	27,196	929		38,290	148,363
1904	116,356	27,387	36,248	973		151,359	332,323
1905	224,967	40,943	56,583	279	248,241	13,442	584,455
1906	274,655	39,667	61,480	876	172,973	4,700	554,351
1907	218,439	69,012	26,922	2,852	195,190	10,646	523,061
1908	247,342	104,525	20,758	90	125,634	31,961	530,310
1909	345,182	109,884	30,842	—	290,176	92,101	868,185
1910	401,530	174,779	26,728	26	283,769	69,314	956,146
1911	309,386	236,712	38,757	344	211,078	52,222	848,499
1912	431,659	376,894	64,740	7,567	255,600	103,279	1,239,739
1913	550,334	577,516	74,499	10,547	493,883	236,514	1,943,293
1914	503,458	552,455	38,353	8,183	208,512	87,275	1,398,236
1915	459,737	420,323	27,449	15,967		23,995	947,471
1916	681,377	1,250,046	31,708	44,267		13,556	2,020,954
1917	1,098,323	1,848,754	37,821	29,252		43,852	3,058,002
1918	1,021,620	842,286	29,637	36,835		29,241	1,959,619
1919	1,028,051	970,642	37,012	91,008		21,099	2,147,812
1920	1,141,864	519,856	105,830	129,679	1,287	23,353	1,921,869
1921	1,314,793	368,582	73,398	54,515	4,810	37,566	1,853,664
1922	1,189,984	194,835	13,121	9,041	10,133	16,841	1,433,955
1923	1,262,000	156,655	36,399	42,140	12,661	20,927	1,530,782
1924	958,369	130,262	43,246	29,191	7,893	33,229	1,202,190
1925	721,026	155,323	64,176	63,169	8,927	43,420	1,056,041
1926	488,672	228,089	94,065	152,550	30,458	68,566	1,062,400
1927	298,201	262,692	74,076	59,006	5,222	50,518	749,715
1928	382,479	289,405	132,894	209,541	28,554	65,675	1,108,548
1929	389,439	183,750	202,596	234,675	31,698	56,020	1,098,178

**Localization**

a. General: An examination of the customs statistics on the relative importance of Chinese ports in the import of hosiery, from 1902 to 1929, shows fairly accurately the geographical distribution and growth of the consuming centres. Furthermore, it indirectly suggests the rise of native producing districts. Shanghai, for example, was the leading port of hosiery import from 1902 to 1914, but after 1914 it never regained its former significance in this respect except in 1929, despite the increasing demand for hosiery from the consuming public. The explanation, if any, lies in the rise of the native knitting industry there. Similarly,



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the loss of second or third place by Canton in hosiery import before 1914, and its disappearance from the list of first four places after that year, is due to the effort of Canton manufacturers to produce their own hosiery, Hankow, an interior port on the Yangtze River, assumed the first place only after 1914. Its slow reaction towards the consumption of imported hosiery is a fair index of economic backwardness, as compared with Shanghai or Canton. Dairen, in this regard, is even more so than Hankow, and, as shown in Tables 3a and 3b, it did not succeed in taking over the first place formerly pertaining to Hankow until 1926.

**Table 3a. Relative importance of Chinese ports in the import of hosiery, 1902-1929 (in percentages)**

Year	Shanghai	Canton	Kowloon	Hankow	Dairen	Tientsin	Amoy	Swatow	Other
1902	1(87.3)	2( 8.6)					3( 2.1)		4( 1.2)
1903	1(49.0)	2(28.1)					3( 9.8)		4( 3.2)
1904	1(57.7)	2(26.7)					4( 3.6)		3( 4.5)
1905	1(54.5)	2(19.9)	3( 9.3)						4( 4.5)
1906	1(38.6)	3(16.8)	2(21.1)		4( 4.2)				
1907	1(38.3)	3(11.7)	2(21.2)		4( 9.8)				
1908	1(24.4)	2(21.8)	3(14.6)						
1909	1(35.3)	3(11.3)	2(13.1)						4( 5.3)
1910	1(31.6)	4( 6.9)	2(20.0)		3( 8.0)				
1911	1(27.8)	4( 6.2)	2(13.8)		3(13.5)				
1912	1(31.6)	2(10.6)	3( 9.5)	4( 8.5)					
1913	1(41.0)		3( 7.5)	2( 8.6)		4( 5.8)			
1914	1(25.8)	4( 6.3)		2(12.9)		3( 6.5)			
1915	2(10.3)			1(15.2)		3( 8.7)			4( 8.1)
1916	2(13.0)			3(11.1)	4( 5.9)				1(35.1)
1917	2(17.5)			3(10.7)	4( 5.9)				1(28.6)
1918	2(13.2)	4( 8.0)		1(14.4)	3( 8.5)				
1919	4(11.2)			1(21.3)	2(13.1)				3(12.3)
1920	3(11.9)			1(17.7)			2(16.8)	4( 6.9)	
1921	2( 9.2)			1(28.3)	3( 9.1)		4( 8.3)		
1922	2(12.0)			1(35.6)	3( 8.5)	4( 4.6)			
1923	2(11.3)			1(30.2)	3( 8.0)			4( 6.2)	
1924	2(11.5)			1(31.4)	3( 7.8)				4( 5.6)
1925	2(13.8)			1(26.6)	3(11.2)			4( 6.8)	
1926	2(23.4)			3( 9.2)	1(23.9)		4( 7.4)		
1927	3(11.6)				1(35.7)		2(12.4)		4( 9.0)
1928	2(23.9)				1(30.9)		3(10.7)	4( 4.4)	
1929	1(40.5)				2(15.4)				3( 7.2), 4( 4.8)

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Table 3b. Gross import of hosiery into important ports of China,  
1902-1929 (in Haikwan Taels)

Year	Shanghai	Canton	Hankow	Dairen	Tientsin	Other	All ports
1902	214,759	21,238				10,005	246,002
1903	62,394	35,749			2,041	27,181	127,365
1904	175,860	81,472			2,633	45,073	305,038
1905	306,722	112,108			13,576	129,902	562,308
1906	206,470	89,988	875		12,641	224,942	534,916
1907	189,831	57,823	8,209	20,886	12,005	206,716	495,470
1908	123,424	110,530	1,181	49,609	10,792	210,532	506,068
1909	311,552	99,614	29,082	38,915	28,642	376,016	883,821
1910	305,178	67,062	31,710	76,906	19,654	465,369	965,879
1911	235,644	52,492	37,727	114,218	22,636	383,864	846,581
1912	393,856	132,506	105,390	25,694	53,651	533,686	1,244,783
1913	789,928	105,113	165,258	20,077	112,732	733,896	1,927,004
1914	353,056	86,383	176,126	71,736	89,374	589,571	1,366,246
1915	95,885	64,108	140,775	58,831	81,012	488,586	929,197
1916	248,131	66,299	212,852	112,241	88,672	1,186,789	1,914,984
1917	519,564	175,499	319,305	176,660	136,005	1,643,546	2,970,579
1918	248,636	149,665	270,060	160,283	98,446	953,757	1,880,847
1919	228,900	54,600	435,065	267,284	124,624	933,042	2,043,515
1920	235,145	56,950	350,509	130,221	123,219	1,081,441	1,977,485
1921	176,766	56,305	542,253	174,143	82,624	882,622	1,914,713
1922	166,843	24,689	495,900	118,751	64,510	522,373	1,393,066
1923	167,472	18,188	449,238	118,317	38,605	693,547	1,485,367
1924	145,288	17,093	595,181	98,568	22,789	579,853	1,258,772
1925	149,542	3,041	287,003	121,292	8,291	510,843	1,080,012
1926	247,388	18,395	97,466	252,527	10,819	430,958	1,057,553
1927	82,857	6,681	1,966	254,318	6,540	359,043	711,405
1928	267,189	29,111	7,795	345,629	15,586	453,010	1,118,320
1929	437,373	46,322	14,120	166,109	32,856	382,219	1,078,999

That the native knitting industry has grown up in various parts of China may be further substantiated by export statistics from the Customs and the rather incomplete statistics of production from the former Ministry of Agriculture and Commerce in Peking. Beginning with the year 1923, the customs returns enumerated for the first time the export of Chinese socks and stockings from various ports, of which Shanghai was the most important. Of the total value of cotton socks and stockings exported from Chinese ports, about ninety percent were contributed by Shanghai, the rest by Canton, Kowloon, Harbin, Hankow, Tientsin and other ports. This does not tend to show that a similar portion of the industry has grown up in Shanghai. It may be true that the extent of

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Shanghai's knitting industry is the largest in China, but it must also be observed that in other places such as Canton and Wuhan (Hankow, Hanyang and Wuchang), the industry has also been developed to a considerable extent. Unless through actual field investigation it would have been impossible to estimate, if not to state exactly, the actual output of hosiery in different knitting centres of China. The export statistics tell only one side of the story; we must not fail to take note of the amount of hosiery devoted to local consumption. In Tables 4a and 4b statistics on the gross export of cotton socks and stockings from Chinese ports, to other ports or to foreign countries, are given. In this connection it may

**Table 4a. Relative importance of Chinese ports in the export of cotton socks and stockings, 1923-1928 (in percentages)**

	1923	1924	1925	1926	1927	1928
Shanghai	1(91.2)	1(90.6)	1(88.0)	1(88.6)	1(93.1)	1(95.2)
Canton	2( 5.1)	2( 4.0)	2( 5.9)	2( 8.2)	2( 4.1)	2( 2.6)
Kowloon	3( 1.1)	3( 2.3)	3( 2.7)		4( 0.8)	3( 1.2)
Harbin	6( 0.5)	4( 1.1)	4( 1.5)	3( 1.8)	3( 1.6)	4( 0.6)
Hankow		6( 0.7)	5( 1.1)	4( 0.6)	5( 0.1)	
Ningpo	4( 0.6)	5( 0.8)				
Darien				6( 0.1)	6( 0.1)	
Tientsin			6( 0.2)			6( 0.1)
Other	5( 0.6)			5( 0.1)		5( 0.2)

**Table 4b. Gross export of cotton socks and stockings from Chinese ports, 1923-1928 (in Haikwan Taels)**

	1923	1924	1925	1926	1927	1928
Shanghai	1,609,029	1,450,933	1,428,751	1,860,328	1,779,876	2,196,707
Canton	89,601	64,327	96,023	172,676	77,809	59,450
Kowloon	19,246	36,715	44,548	3,087	16,018	26,620
Harbin	9,554	17,048	24,254	38,313	30,606	13,746
Hankow	6,761	11,731	18,647	11,943	2,429	822
Tientsin	1,413	353	2,825	1,809		2,549
Other	29,188	20,314	8,832	10,173	4,531	7,237
All ports	1,764,792	1,601,421	1,623,880	2,098,329	1,911,269	2,307,131

**CHAPTER I. HISTORY AND LOCALIZATION**

be noted that most of the socks and stockings exported from the Chinese ports were imported into other Chinese ports, amounting on the average to eight-six percent for the six years 1923-28, the rest fourteen percent being taken by foreign countries including Hongkong, Singapore and the Straits, Phillipine Islands, Dutch Indies, etc. In Tables 5a and 5b statistics on the export of Chinese socks and stockings to foreign countries are shown.

**Table 5a. Relative importance of foreign countries in the import of cotton socks and stockings from China, 1923-1928 (in percentages)**

Year	Hongkong	Singapore, Straits, etc.	Philippine Islands	Dutch Indies	Other
1923	1(57.7)	2(17.7)	3( 8.8)	4( 6.1)	
1924	1(47.0)	2(23.9)	3(10.0)	4( 6.4)	
1925	1(45.7)	2(30.2)		3( 4.5)	4( 4.5)
1926	2(22.3)	1(54.6)		3( 7.9)	4( 4.3)
1927	1(35.3)	2(31.5)	4( 8.6)	3(16.7)	
1928	1(43.9)	2(26.0)	4( 6.9)	3(12.5)	

**Tables 5b. Export of Chinese cotton socks and stockings to foreign countries, 1923-1928 (in Hk. Tls.)**

Year	Hongkong	Singapore, Straits etc.	Philippine Islands	Dutch Indies	Other	Total	% of total export from Chinese ports
1923	128,008	39,390	19,581	13,613	21,411	222,003	12.5
1924	115,726	56,757	23,749	15,186	26,507	237,925	14.9
1925	105,777	69,949	8,001	10,492	37,139	231,358	16.1
1926	58,323	142,706	7,028	20,595	32,323	261,475	12.5
1927	92,455	82,614	22,422	43,832	20,701	262,024	13.7
1928	78,216	46,289	12,300	22,361	19,030	178,176	7.7

The statistics of production for the knitting industry, as compiled by the former Ministry of Agriculture and Commerce in Peking, are complete except for the last five years of the Republic, from 1916 to 1920, when some provinces, because of war, flood or other causes, failed to send in reports to the Ministry in conformity with its regulations.

Table 6. Statistics on hosiery knitting industry in China, 1912-1920

Year	No. Mfrers.	No. workers			Value of output (in dollars)						
		Male	Female	Total	Sweaters, pants	Gloves	Socks, Stocking	Underwear	Towels	Other	Total
1912	74,388	14,250	128,402	142,652	7,906,823	565,804	1,205,234	940,867	1,753,392	323,094	12,695,214
1913	10,548	17,112	62,924	80,036	191,728	113,204	968,685	250,624	1,698,334	477,173	3,699,748
1914	9,649	18,130	23,536	41,666	438,911	308,212	1,360,619	217,657	1,843,799	501,614	4,670,812
1915	47,993	23,179	34,236	57,415	953,847	264,468	1,580,958	355,969	1,536,657	997,561	5,689,460
1916	9,644	15,843	18,820	34,663	1,041,955	458,064	2,567,421	87,544	1,806,004	247,346	6,208,334
1917	11,578	19,740	29,074	48,814	673,855	687,585	2,718,873	861,128	————	1,400,838	6,342,279
1918	10,940	12,775	45,773	58,548	1,194,615	721,997	3,844,416	336,531	————	1,445,951	7,543,510
1919	22,560	9,579	41,684	51,263	997,649	154,421	3,708,076	293,005	————	1,882,166	7,035,317
1920	18,649	13,288	29,018	42,306	1,596,516	191,919	4,506,988	184,628	————	2,511,751	8,991,802

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These last years, however, are years of prosperity for all native manufactures in China, because of the abnormal conditions of supply created by the World War. The hosiery knitting industry, like other infant industries of China, received a great impetus to its development due to the absence of foreign competition. In this rather striking development, as shown in Table 6,<sup>4</sup> the lead was taken by the Kiangsu province, followed by Kwangtung, Chekiang, Liaoning and Hupeh. In Tables 7a and 7b, the relative importance, as well as the total value of output, is given for these provinces for the years 1912 to 1920.

4. Statistics for the years 1912 and 1913 are incorrect, as shown in the following table, in which the share of Chihli (i.e. Hopei) province in China's hosiery knitting industry, expressed in percentages, is shown. The disproportionate percentages for the manufacturers, female workers, sweaters and pants, underwears and towels, for the years 1912 and 1913, as compared with similar percentages for other years, cannot be explained except by clerical errors. An addition of one or more zeros, for instance, may have unusually swollen the figure to a very large one.

Year	Manufac- turers	Workers			Output						
		Male	Female	Total	Sweaters, pants	Gloves	Socks, Stockings	Under- wear	Towels	Other	Total
1912	83.52	11.42	81.89	74.33	93.23	.77	.77	17.87	12.11	.82	61.85
1913	1.02	1.54	33.53	26.69			.41	7.90	3.60	.52	2.36
1914	.91	1.58	.21	.81		.05	.82		1.43	1.08	.92
1915	.68	1.61	.13	.78			1.83		2.41	2.35	1.59
1916	.86	1.63	.27	.89			1.42	1.37	1.91	.91	1.19
1917	.49	.69	.06	.31			2.42	.14		.09	1.07
1918	.69	1.99	.14	.54			3.74	.36		1.34	2.18
1919	1.05	3.24	1.17	1.56			2.65	.05		.09	1.66
1920	.66	2.67	.62	1.27		.21	3.98	.09		14.09	5.91

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**Table 7a. Relative importance of leading provinces in hosiery output, 1912-1920 (in term of value)**

Year	Kiangsu	Chekiang	Kwangtung	Liaoning	Hupei	Other
1912	2	4	1			3
1913	1		2		4	3
1914	1	2	3			4
1915	2	3	1	4		
1916	1	4		3	2	
1917	1	3	2	4		
1918	1	2		3		4
1919	1	2				3,4
1920	1					2,3,4

**Table 7b. Value of hosiery output for leading provinces, 1912-1920 (in dollars)**

Year	Kiangsu	Chekiang	Kwangtung	Liaoning	Hupei
1912	608,255	380,801	2,558,620	3,687	96,192
1913	836,684	565,039	714,480	10,871	320,197
1914	1,049,015	771,528	714,480	520,009	91,390
1915	1,219,764	874,865	1,289,699	556,629	257,385
1916	1,364,862	687,845	+	1,018,250	1,183,202
1917	1,991,504	971,951	1,228,528	792,622	210,140
1918	2,327,892	1,517,459	+	1,002,920	532,516
1920	3,193,189	1,321,980	+	+	+
1920	5,119,247	+	+	+	+

× Incomplete      + No returns

As 1915 represents the last year for which the Ministry's production statistics cover practically every province, statistics for that year are given in Table 8 for the further reason that the rapid development of China's hosiery knitting industry took place around that year.

**Table 8. Provincial distribution of hosiery knitting industry in China, 1915**

Province	No. Mfrs.	No. workers		Total	Value of output (in dollars)						Total
		Male	Female		Sweaters, pants	Gloves	Socks, Stockings	Under-wear	Towels	Other	
Peking Metropolitan District	43	220	3	223	4,550	1,115	15,279	—	15,042	14,879	50,865
Chihli	100	374	46	420	—	—	28,925	—	38,105	23,417	90,447
Fengtien	438	1,434	—	1,434	312,496	99,876	137,415	—	6,842	—	556,629
Kirin	20	231	—	231	6,600	15,000	38,920	—	11,177	141,758	213,455
Heilungkiang	8	27	—	27	6,000	2,300	3,300	1,200	1,150	975	14,925
Shantung	39	168	—	168	—	—	620	—	34,455	—	35,075
Honan	115	175	177	352	—	187	195	—	14,115	1,013	15,510
Shansi	53	398	—	398	—	—	216	—	1,275	104,082	105,573
Kiangsu	19,827	2,957	12,951	15,908	13,365	19,571	384,448	4,900	744,880	52,600	1,219,764
Anhwei	355	617	658	1,275	960	6,374	40,296	1,490	63,489	—	112,609
Kiangsi	1,913	1,539	4,502	6,041	3,725	1,273	17,580	1,727	54,080	68,257	146,642
Fukien	33	86	20	106	1,050	—	10,756	1,504	4,109	—	17,419
Chekiang	2,745	4,454	6,901	11,355	105,765	17,174	371,659	42,085	118,554	219,628	874,865
Hupeh	459	2,780	1,988	4,768	57,500	13,496	129,535	210	50,320	6,324	257,385
Hunan	648	4,076	846	4,922	8,256	30,645	117,252	10,663	143,259	1,907	311,982
Shensi	52	1,790	320	2,110	—	—	5,400	—	4,120	28,975	38,495
Kansu	19	20	—	20	100	—	—	1,500	—	—	1,600
Sinkiang	—	—	—	—	—	—	—	—	—	—	—
Szechuen	—	—	—	—	—	—	—	—	—	—	—
Kwangtung	17,933	1,487	2,270	3,757	430,480	56,657	270,182	288,080	219,917	24,383	1,289,699
Kwangsi	3,168	314	3,524	3,838	—	100	8,980	2,610	5,520	309,363	326,573
Yunnan	—	—	—	—	—	—	—	—	—	—	—
Kweichow	25	32	30	62	3,000	700	—	—	6,248	—	9,948
Jehol	—	—	—	—	—	—	—	—	—	—	—
<b>Total</b>	<b>47,998</b>	<b>23,179</b>	<b>34,236</b>	<b>57,415</b>	<b>953,847</b>	<b>264,468</b>	<b>1,580,958</b>	<b>355,969</b>	<b>1,536,657</b>	<b>997,561</b>	<b>5,689,460</b>



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Except in Tientsin where an intensive survey into the hosiery knitting industry has been undertaken by this Committee, information on the industry in other centres, quoted below, is based largely on superficial investigation or intelligent observation. In view of the general ignorance on the subject and of the failure of the industry or the government to acquaint the public with its present conditions, such information may serve as a rough guide to those interested in China's hosiery knitting industry.

b. Kiangsu province. In this province Shanghai is the nucleus for the hosiery knitting industry.<sup>5</sup> It is, in fact, the chief centre for China. Before 1916 there were only a few establishments engaged in this industry, but in 1922 the number for silk hosiery knitting alone was increased to forty. In the previous year an "Association for the Sock and Stocking Manufacturers" (織襪公會) was organized, which enlarged its scope and adopted a new name, the "Hosiery Manufacturers' Association" (針織公會), in 1927. By the end of 1928 the Association had already a membership of eighty-five, which was further increased to one hundred and fourteen by April, 1929. The non-members at that time were estimated to be about twenty in number. The total number of knitters, employed in these one hundred and thirty or more establishments, reached six thousand, of whom about two thirds, or four thousand, were women. This number, however, fluctuated with the season, the first half of the year being busier than the second. In the thirty-nine member establishments, the employment of power machine, chiefly of American make imported through the Andersen Meyer & Co., constitutes a novel feature in China's hosiery knitting industry, and gives evidence to the enterprising spirit of Shanghai manufacturers. These thirty-nine member establishments employed a total of 1,389 plain knitting machines, 290 ribbed knitting machines, 222 sewing machines and 2,530 winding machines, all operated by electric power. The Pioneer Knitting Mill (中華第一針織廠), formed in 1917, had the largest number of each type of machines,—210 plain, 52 ribbed, 26 sewing and 426 winding, or a total of 714 machines. The distribution of the plain and ribbed knitting machines among the thirty-nine member establishments is shown in Table 9.

5. For information on the Shanghai hosiery knitting industry, see an article in *Semi-monthly Economic Journal* (in Chinese), July 15, 1929.

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Table 9. Shanghai hosiery knitting establishments classified by number of machines owned, 1929

No. machines per establishment	No. establishments	Total No. machines	No. machines per establishment	No. establishments	Total No. machines
1- 10	7	58	61- 70	4	250
11- 10	8	135	71- 80	—	—
21- 30	5	119	81- 90	3	250
31- 40	5	166	91-100	2	190
41- 50	2	87	Above 100	2	370
51- 60	1	54	Total	39	1,679

The capital investment of Shanghai knitting establishments varies considerably, from the smallest of three hundred taels to the largest of no less than a million. According to one estimate, "there are now 70 knitting factories with capital of Tls. 200,000 and about 40 factories with capital of from several hundred taels to several thousand taels".<sup>6</sup>

Besides Shanghai, there are other centres in Kiangsu where the hosiery knitting industry flourishes to a varied extent. Following the Shanghai-Hangchow-Ningpo Railway southward, we come to Sungkiang, where dozens of establishments are engaged in hosiery knitting. According to a report in 1923,<sup>7</sup> about ten thousand workers, both men and women, were employed in these establishments. This number evidently included the outworking sewers as well as the small knitters working under the merchant employer system. Lü Ho (履和), which was equipped with four hundred hand and twenty power machines, was the best known factory of the city, and turned out 150,000 dozens of cotton and silk hose per year, valued at \$400,000. Next in importance was Ching Ho (晉和) factory which had three hundred hand machines producing 150,000 dozens of cotton hose valued at \$370,000 annually. Ta Sun (大生) factory had one hundred and forty hand knitting machines producing annually 50,000 dozens of cotton hose, two-ply yarn, valued at \$100,000. Among others there were Jen Ho (仁和) and Tien Yi (天益), each having 120 hand machines producing annually 45,000 dozens of hose valued at \$90,000. Yi Ho (怡和), Chiu Ho (久和), Chen Ho (振和), Sung Hua (松華), Hsing Ho (信和) and Teh Ho (德和) had a little over one hundred hand machines each, with a yearly output ranging from 10,000 to 30,000 dozens.

Again, following the Shanghai-Nanking Railway northward, we come first to Wusih, where a dozen hosiery knitting establishments were reported in existence in 1922. In 1929 the number was increased to thirty, employing over three thousand hands, chiefly outworkers receiving work from these establishments on a piece rate basis.<sup>8</sup> Passing over

6. *Chinese Economic Journal*, January, 1929, p. 68.

7. *Chinese Economic Bulletin*, June 9, 1923.

8. *Ibid.*, March, 18, 1922; June 15, 1929. *The statistical monthly*, August, 1929, p. 17., reported a total of 1, 882 workers in hosiery knitting establishments.

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Chinking (鎮江), where ten establishments resumed business after a depression in 1923,<sup>9</sup> the next knitting centre is Nanking, where a number of small establishments were reported in operation in 1925. Chen Hsing (振興), the biggest of all, had a capital of but \$8,000, employing no more than fifty hands, chiefly women. Other establishments worked on a much smaller scale than Chen Hsing, each employing from three or four to about a dozen hands, with a capital varying from \$400 to \$2,000. Most of these workshops had their premises in back streets or in deserted quarters of the city so as to save rent. Besides selling own products, these workshops sold matches, cigarettes and soaps as side-lines. They sent their output to the dealers only when they were unable to dispose of it in their own sales department. Some workshops, such as Chang Hu Kee (常湖記), also had a towel knitting department, and turned out Turkish towels for local consumption. In fall and winter, these establishments were engaged in producing scarfs and caps besides hoses. The latter not only supplied the local market, but were exported to Anhwei, Shantung and Northern Kiangsu districts.<sup>10</sup>

Besides these knitting centres along the railway lines, Yangchow, located across the northern bank of the Yangtze River, had also a small knitting industry, carried on chiefly under the merchant employer and family craftsman systems. In Yangchow there were six to seven hundred knitters, of whom about two thirds worked under the family craftsman system. Under this system the family craftsmen, chiefly mothers and daughters of the family, provided themselves with machines and purchased own yarns for knitting. The finished products, mostly hoses, were sold to the miniature department stores or hose bazaars, the former on credit and the latter on cash basis. Under the merchant employer system, on the other hand, the machines were provided by the establishments giving out yarns to the outworkers for knitting, at a piece rate. There were three such establishments operating on a fairly large scale, namely Hua Chang (華昌) having 120 to 130 machines, Ta Cheng (大成) having 60 to 70 machines, and Yuan Chang (元昌) having 50 to 60 machines.<sup>11</sup>

c. Kwangtung province. In this province Canton is the largest centre for hosiery knitting. According to the *Canton Trade Report* of 1920, there were in Canton five large factories and several hundred workshops for producing hose and underwear, the trade being quite flourishing on account of the high price for imported articles. Another report by a local daily in 1921 claimed that the native hosiery business had so prospered that imported goods had almost disappeared from the market. The factories and workshops were reported to number more than a thousand with an employment of nearly 20,000 workers, probably including all those knitting

9. *Chinese Economic Bulletin*, March 31, 1923.

10. *Ibid*, Nov. 7, 1925; Nov. 17, 1928.

11. *Chinese Weekly Economic Bulletin* (in Chinese), Jan. 29, 1927.

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or sewing on part-time basis. Most of these establishments were situated in the vicinity of Sikwan (西關), of which the most prominent included Yung Yeh (永業), Ta Tung (大東), Ming Yeh (民業), Ch'eng Tung (震東), Yu Hsing (裕興), Chen Hua (振華), Hui Kung (惠工), Li Hua (麗華), Kung Hsing (公興), Kwang Ming Hsing (廣民興) and Canton Hosiery works (廣州). The last one had been in operation for nearly twenty years in 1925, and marketed its output through own sales department in Shanghai.<sup>12</sup>

d. Chekiang province. In this province the hosiery knitting industry flourishes around Pinghu, Kashing, Kashan, Shihmen, and Siashih, located along both sides of the Shanghai-Hanchow-Ningpo Railway. In Pinghu the industry furnishes one of the best examples of the merchant employer system in China. Here the hosiery establishments were chiefly business firms which performed the twin functions of capitalist and middleman. They provided the capital, purchased the machines, and gave out yarns to the outworkers for knitting on a piece rate basis. The outworker, in receiving yarns for knitting from the merchant employer, must rent from him a knitting machine by the payment of a special initiation fee of two dollars and a deposit of six dollars. The special initiation fee was paid once for all, but the deposit could be refunded at the return of the machine. Henceforth the outworker paid a monthly rent of two dollars per machine so long as he remained in the employment of the merchant employer, the rent being deducted directly from the wages earned during the month. This system, as so described, entailed excessive gain to the merchant employer, for in a year's time the latter could be refunded for the cost of the machine, which, on the average, did not exceed twenty or twenty-five dollars. Whatever expenses he might have to incur for repair and maintenance of the machine amounted to very little. On the other hand, the outworkers, chiefly women and girls, also profited from this system, although not to the same extent as they really deserved. Before the introduction of the industry under the merchant employer system around 1912, women of the poor families had no by-employment but the performance of household duties. The girls, meantime, had not even the necessary household duties to perform, but remained idle during most of the time. After the introduction of the industry under the merchant employer system, both women and girls could devote spare times to gainful employment, without the initial provision for capital. The rate for knitting hoses varied from twenty-two to twenty-six cents per dozen in 1926, or twenty-four cents on the average. Calculating on the basis of one dozen per day or thirty dozens per month, the monthly earnings, deducting the rent of two dollars, still amounted to more than five dollars. As there were about 8,000 machines in the whole of Pinghu, not including those unemployed or in repair, the total net

12. *Chinese Economic Bulletin*, June 29, 1921; Jan. 7, 1922; May 30, 1925.

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earnings for the outworkers per year, on the basis of one dozen per day per machine, would have amounted to no less than \$332,800, provided that eight months of the year were kept fully at work. This sum, plus the earnings of sewers and ironers, at three cents per dozen, would have amounted to the grand total of \$390,400.

Of the merchant employers, Kwang Hua (光華), the largest, had one thousand machines. Tung Hu (當湖) had 600; Chi Hsin (啓新), 400; and Yi Ho (和怡), another 400. Besides, there were ten merchant employers having 200 machines each; sixty, 50 to 100 each; and ten, below 50 each. Hsin Chang (新倉) and Tsai Pu (乍浦), two neighboring districts of Pinghu, had six to seven hundred machines each. The hoses manufactured by these merchant employers were of different varieties, including cotton, woolen, natural or artificial silk. Before 1917 the market for these hoses did not extend beyond Kiangsu and Chekiang, but after that year it was broadened to the provinces along the Yangtze River, and after 1926, to the Yellow River Region.<sup>13</sup>

In Kashing the hosiery knitting industry was not started until a decade ago, and grew so rapidly that at one time it boasted of 150 establishments. However, a slump in the industry caused by the rise in the price of cotton yarn, compelled almost two thirds of the establishments to close down in 1924. In the following year, an association was formed to establish a uniform price scale in order to avoid cut-throat competition, but it included only thirty-two establishments.<sup>14</sup>

Following the Shanghai-Hangchow-Ningpo Railway westward, the next knitting centre, Hangchow, is reached. Here the hosiery knitting industry includes the several branches of underwear, hoses and towels, especially hoses. In 1929 there were thirteen establishments with a total capital investment of thirty-five thousand dollars, varying from the smallest of three hundred to the largest of ten thousand dollars. Most of these establishments produced cotton hosiery for interior consumption, and did not have regular workers on the premises except in busy seasons. In ordinary time, work was given out to female workers at own home, at a piece rate. The total number of indoor workers, in busy seasons, did not exceed four hundred, of whom four fifths were females. The daily producing capacity for the thirteen establishments was placed at 1,290 dozens of hoses, averaging two dozens per hand machine. Power machine was uncommon, except in one of the largest establishments, Sui Lung (萃隆). The last establishment, like Chen Hsin (振興), Hua Tung (華通), Heng Yen Hsin (恆義興) and Teh Sun (德生), had 60 to 120 hand machines. The smaller ones had but ten to twenty machines each.<sup>15</sup>

13. *Chinese Weekly Economic Bulletin* (in Chinese), Jan. 23, 1926; or, *Chinese Economic Bulletin*, Jan. 2, 1926.

14. *Chinese Economic Bulletin*, June 16, 1924; May 16, 1925.

15. *Semi-Monthly Economic Journal*, Sep. 1, 1929.

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Turning eastward from Hangchow, another knitting centre along the Shanghai-Hangchow-Ningpo Railway is reached, namely, Ningpo. In this city there were eleven hosiery knitting establishments in 1929, producing annually one hundred thousand dozens of socks, caps, underwears and other knit articles. The product was consumed chiefly within the province, but at times it was also exported to the Strait Settlements, to a rather small extent however.<sup>16</sup>

e. Liaoning province. - In this province hosiery knitting industry flourishes in Mudken, Liaoyang, Newchang, Haicheng, and Chingchow. In Liaoyang there were in 1924 forty-three hosiery knitting establishments with a total capital of \$121,500. These establishments were equipped with 205 knitting machines, chiefly operated by hand but partly by power, and employed 386 hands. Their total yearly output was estimated at 300,000 dozens of hoses, of which two thirds were marketed at Dairen, Antung, Changchung and other parts of Manchuria, the rest being consumed locally. About forty percent of the hoses were made of cotton yarn, supplied chiefly by the native cotton mills in Newchang and Liaoyang, the remainder, of mercerised cotton or rayon yarn imported from Japan. In 1923 about 450 bales of cotton yarn and 630 bales of mercerised cotton and rayon yarn were consumed by the hosiery knitting works in Liaoyang.<sup>17</sup>

f. Hupeh province. In this province the hosiery knitting industry is centred in the Wuhan cities, embracing Wuchang, Hankow and Hanyang. The industry was introduced into this region during the war time, but its rapid development did not take place until after 1922. In 1925 Wuchang alone had fifty knitting establishments, producing an annual output of 221,080 dozens of hoses, and employing altogether 469 knitting machines and 636 workers, including knitters, sewers, winders and other hands connected with the industry. The actual sizes of these establishments can be stated in term of annual output, workers and knitting machines. In term of annual output, 4 establishments produced 500 dozens or less each; 8 establishments, 501-1,000 dozens each; 9 establishments, 1,001-2,000 dozens each; 7 establishments, 2,001-3,000 dozens each; 3 establishments, 3,001-4,000 dozens each; 9 establishments, 4,001-5,000 dozens each; 3 establishments, 5,001-10,000 dozens each; and 7 establishments, 10,001-20,000 dozens each. In term of the number of workers employed, 15 establishments had five or fewer workers each; 16 establishments, 6-10 workers each; 5 establishments, 11-15 workers each; 5 establishments, 16-20 workers each; 3 establishments, 21-25 workers each; 5 establishments, 26-30 workers each; and one establishment, above 30 workers. In term of the machines owned, 20 establishments had five or fewer machines each; 12 establishments, 6-10 machines each; 6 establishments, 11-15 machines each; 6 establishments, 16-20 machines each; and 6 establish-

16. *Ibid.*, June 1, 1929.

17. *Chinese Economic Bulletin*, June 21, 1924.

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ments, 21-25 machines each.<sup>18</sup> These fifty establishments in Wuchang, therefore, were generally small, with the exception of Yu Chung Hosiery Mill (裕中襪廠). The latter was organized by Hsu Shao-shu (徐紹庶) with a capital of Tls. 50,000. It could produce 20,000 dozens of hoses per year, and unlike other establishments, had its machines run by electricity.

In 1927 a total of about two hundred hosiery establishments were reported in operation in the Wuhan cities, although most of them worked on a very limited scale. With the exception of Yu Chung Mill noted above, the machines for other establishments were manufactured by six works in Hankow, at a very low cost of twenty to forty dollars each. Of the six machine works in Hankow, Tien Sun (天孫) turned out the best knitting machines. The product of Teng Shun Chang (鄧順錫) was of medium grade, that of Yi Ho (協和) being cheapest. The other three works included Pa Li (百利), Cheng Kee (針記) and a branch of Tien Sun.

Hoses constituted the major bulk of the products for the Wuhan establishments, made of cotton, woolen, silk and rayon yarns, especially cotton yarns of ten, sixteen, twenty, and thirty-two counts. A considerable portion of the output found its way to the markets in Szechuen, Honan, Anhwei, Yunnan, Kweichow and the interior parts of Hupeh, Honan being the largest consumer. The general practice was for the hosiery establishments to sell their products to the exporters direct, allowing them from one to three or four months' credit.

Like in Shanghai, the Wuhan manufacturers and knitters were organized respectively into the Wuhan Hosiery Manufacturers' Association (武漢針織襪業公會) and the Wuhan Hosiery Knitters' Union (武漢織襪總工會). In 1927 both organizations signed an agreement concerning the treatment of knitters, which, because of its unique character, may be briefly summarized in this connection. No hosiery establishment should dismiss their employees except during one of the three festivals of the year, namely, the Dragon, the Moon and the New Year festivals. The term of apprenticeship should be limited to two years. No owner, manager or foreman of any hosiery establishment should maltreat the apprentices. Two days of rest per month should be given to the workmen and apprentices alike. The scale of wages, on piece work basis, was also drawn up and standardized.<sup>19</sup>

g. Kiangsi province. In this province hosiery knitting is carried on in two termini of the Nanchang-Kiukiang Railway (南潯鐵路), namely, Nanchang and Kiukiang. In Nanchang the industry was started in 1922, when two types of hosiery knitting establishments were formed, the one knitting cotton hoses and the other mercerised cotton hoses. The former, however, constituted ninety-five percent of the total establish-

18. *Ibid.*, Dec. 26, 1925.

19. *Ibid.*, May 14, 1927. Or, *Chinese Weekly Economic Bulletin*, Feb. 12, 1927.

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ments, and knit hoses chiefly as a by-employment to towel production. In 1926 there were about sixty establishments engaged in this business, employing a total of three thousand workers, including both sexes of all ages who worked a part or all of the time during the day. These establishments, as a whole, were small and crowded, and gave out machines and yarns for knitting at the outworkers' homes. In order to increase the production during busy seasons such as fall and winter, they received apprentices who could be taught to knit 180-needle mercerised cotton hose within two months. The apprentice, in learning the trade, had to pay a tuition of eight dollars to the foreman, and about eight or nine dollars as compensation for the needles spoiled. As soon as the apprentice could begin to knit, he or she was generally paid a wage about 20% lower than that for the skilled hands. The foreman, in teaching the apprentices, also had to supervise them in their work, so as to uphold the reputation of the establishment's output. He was paid a small wage on monthly basis, in order to supplement his earnings derived from the tuitions of the apprentices. The total daily output for the Nanchang establishment amounted to 3,000 dozens, or 720,000 dozens per year on an eight-month basis.<sup>20</sup>

In Kiukiang the industry was started in 1914, but its extent was rather small before 1921, having no more than three or four workshops with about ten machines. In 1922, however, the Yi Cheng Knitting Works (益成針織廠) was organized, which also opened a special training school for novices, whether women or children. The regulations of the school resembled those prevalent in Nanchang establishments, as the novice had to pay a tuition of six dollars and another eight to nine dollars for the needles spoiled. No definite term of graduation was set for the novice, the only criterion being the ability to knit one dozen of hoses per day. The novice, after having learnt the art, was paid a wage lower than that for the skilled hand. Up to 1926 the school had trained up about two hundred pupils. The object of the school, however, was more to sell the knitting machine and needles rather than to engage in hosiery knitting. The pupils trained up at the school bought the machines through it, and set up own workshops for knitting, of which there were about ten in 1926.<sup>21</sup>

h. Hopei province. In this province the hosiery knitting industry is centred in Tientsin, the commercial and industrial metropolis of North China, although it has been developed to a small extent in interior districts such as Yu Tien. In the latter place about a hundred small workshops are engaged in this industry, but have suffered considerable loss because of the unsettled conditions in one of the chief markets, Manchuria, arising

20. *Chinese Weekly Economic Bulletin*, May 8, 1926.

21. *Ibid.*, Oct. 23, 1926; *Chinese Economic Bulletin*, May 1, 1926.



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from the Sino-Russian controversy over the Chinese Eastern Railway in the latter part of 1929.

In Tientsin the hosiery knitting industry was started in 1912, when one certain English organized a company to sell the knitting machines imported from Germany, under the name of Chih Tso Hong (捷足洋行). During the same year, it may be reiterated, the value of Tientsin's imported hosiery increased twenty-six fold over that in 1903, namely, Hk. Tls. 53,651. The company sold the machine to the Chinese at the price of one hundred and twenty dollars each, whereas the actual cost for it did not exceed forty-five dollars, with the understanding that any client could knit hoses for the company at the exorbitant rate of \$2.50 per dozen. The amount of woolen yarns required, namely, two pounds for every dozen of hoses, should be purchased from the company, which promised meantime to reimburse its client, pound for pound, when the hoses were knit and returned to the company. The Chinese, who did not realize the excessive profit thus reaped by the company, were prompted by the lucrative promise of knitting hoses at \$2.50 per dozen after having purchased the machine. They tried every means to raise sufficient funds from friends or relatives in order to pay for the machine, and thereby to work for the high wages that the company might pay. The company, however, did not give work to its clients to the extent that it might have to incur a loss from the payment of unbelievable wages. It had resort to several methods so as to dodge the issue. First of all, the client, being wholly ignorant of the mechanism, had to be taught by the company before he could be qualified for knitting. One of the methods employed, consequently, was for the company to prolong the period of training. Secondly, the client had to purchase the woolen yarn from the company before he could proceed to knit. The company, however, could keep down the amount of hoses knit by the client, with the plain statement that no yarns were available. The client had to wait until the consignment arrived from abroad. Thirdly, even when the yarn was available and the hoses were knit, the company complained about the workmanship, and refused to accept the hoses. All these methods were employed at the same time in dealing with its clients, but it did not take long for the latter to discover the truth. One of the clients, Mr. Wang Chi-chung, was a returned student from Japan, who joined the industry after having got through with the life of a revolutionary before the overthrow of the Manchu. He purchased twelve machines from the company, with which he set up a small workshop in order to knit at the excessive rate of wages promised by the company. After having knit about one hundred dozens each time for five or six times, the company refused to accept the hoses delivered by Mr. Wang. The latter, who had by that time understood well enough the company's dishonest practices, took immediate steps to disclose them. As one of the company's practices was to prolong the

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period of training, Mr. Wang organized a training school of his own to serve as the centre for such disclosure. After having trained up eight pupils in a few days without any tuition, the clients of the company began to join Mr. Wang's school, and learnt the truth of the company's deceit. By that time, about the first part of 1913, the company had already sold more than one thousand machines. The clients, under the leadership of Mr. Wang, secured the cooperation of the authorities and surrounded all at once the company's office. The manager, however, had already escaped. All his property was then taken over by the clients, put to auction, and divided among themselves *pro rata*. But to their disappointment, they did not get back even one tenth of what they had already invested in the company.

This episode, the dishonest career of the Chih Tso Hong, nevertheless gave a start to the hosiery knitting industry in Tientsin. The clients who were cheated by the company under the various methods described above had to make the best use of their machines for a living. Among these Mr. Wang was the first to organize a knitting establishment under the name of Foo Yih (福益), which had two departments, the one for the males and the other for the females. Other clients soon followed suit, including Kuo Yu Heng (郭有恆), Yi Sun (義生), Chuan Hua Shūn (鉅華順) and Chan Hua (崇華). From 1913 to 1917 the development was, nevertheless, slow, but after the latter year, the industry underwent a rapid progress, with a period of prosperity soon ensuing. In 1918 the automatic hand machine (自動機) was introduced from Japan by Mr. Wang, who also organized the Tientsin Hosiery Manufacturers' Association. In the following year, electric power was applied to the knitting machines by the North China Hosiery Knitting Company (華北公司), but without success. In 1920 other machines, for the making of caps, gloves, scarfs, sweaters and pants, were imported from Japan. Two years later the semi-automatic hand machine (笨機) was no longer imported from abroad, but from Shanghai; while the automatic hand machine was successfully manufactured in Tientsin by Mr. Wang. At present, there are altogether 154 hosiery knitting establishments in Tientsin employing a total of 1,610 workers—451 knitters and 1,159 apprentices. In Table 10 these establishments, with their respective number of workers, are classified according to the year of establishment. As shown in this table there has been a steady increase in the number of establishments since 1913, with a simultaneous increase in the number of workers employed. In 1923 there were 39 establishments in existence, employing 647 workers, according to the above table. But an investigation by the former Chihli Commercial Museum (直隸商品陳列所), for the same year, reported 27 factories with 845 workmen. From these two different returns

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**Table 10. Tientsin knitting establishments classified  
by year of establishment, 1929**

Year of estab't	No. estab'ts	No. workers	Year of estab't	No. estab'ts	No. workers
1912	2	60	1922	6	45
1913	2	66	1923	8	150
1914	1	7	1924	11	120
1915	1	7	1925	14	143
1916	1	30	1926	14	135
1917	2	30	1927	17	134
1918	2	48	1928	25	231
1919	8	135	1929	34	200
1920	1	14			
1921	5	55	Total	154	1,610

it is evident that the smaller establishments that were overlooked by the Chihli Commercial Museum remained in operation until the time of the Committee's investigation, whereas the larger ones enumerated by the same institution had closed down their business in the last six years. Indeed, 1923 had been a crucial year, during which the hosiery knitting industry in Tientsin began to undergo a period of depression. The larger establishments failed, while the smaller ones, organized by the unemployed workers, sprung into existence. This fact is also revealed in Table 10, which shows the increasing number of establishments after 1923, but with decreasing size every year.

In anticipation of further elaboration in the following chapters, it may be pointed out that in 1929 the Tientsin hosiery knitting industry, including the 154 establishments, employed a total of 1,610 indoor workers and 569 outworkers, the latter being sewers finishing up the hoses produced by the establishments. It had a total capital investment of 180,104 dollars, employing altogether 1,265 knitting machines with necessary accessories. It consumed \$517,968 worth of cotton yarn, \$386,846 worth of woolen yarn, \$27,857 worth of rayon yarn and \$31,003 worth of dyes and dyestuffs—a grand total of \$963,674. It produced 454,186 dozens of cotton, woolen and rayon hoses, 6,245 dozens of sweaters, 2,330 dozens of pants, 6,060 dozens of vests, 4,137 dozens of scarfs, 17,780 dozens of gloves and 5,040 dozens of caps—a grand total of 495,778 dozens of hosiery articles.

## Chapter II. Industrial Organization

### Introduction

Among the small industries in Tientsin, hosiery knitting presents a typical example of organization. The flexibility of industrial systems, a characteristic common to other Tientsin industries such as carpet weaving and rayon weaving, is also found in this industry. The transition from one system of industrial organization to the other in many of the small knitting establishments is not conditioned by the elapse of time, but by the presence of prosperity or depression. A master craftsman may work on own account, providing own workshop, machines and raw materials, while having the hosiery articles knit by family members at spare time, but by workmen as well when the business conditions turn out to be favorable. This arrangement can be easily made especially in view of the small amount of capital required of his undertaking. The low cost of the machine, the facility to secure additional labor, and the high turnover of output—all these facilitate the attempt of the master craftsman to expand his business in a time of favorable market demand, with a small increase in capital borrowed perhaps from friends and relatives, or under the notorious system of instalment payment (轉子錢).<sup>22</sup> On the other hand, the master craftsman may easily contract the scale of his operation in a period of business depression. He can discharge the knitters whose employment is more or less casual, but keep the apprentices who receive no wages. He can keep the idle machines still at work by securing orders from larger establishments, with raw materials supplied. Meantime, his family members may dispense with knitting, partly or wholly, and instead, may take up the sewing of hoses for other establishments. The master craftsman, in other words, is now reduced to an outworker as well as a middleman—middleman in the sense of distributing sewing work among his family members and apprentices on behalf of other establishment,—his merchant employer in a technical sense. This transition from master craftsman to outworker or middleman, and conversely, that from outworker or middleman to master craftsman, portray but one of the many possible arrangements in Tientsin hosiery knitting industry. Besides, a thrifty and enterprising master craftsman may enlarge the scale of his operation in a few years and thereby becomes a regular manufacturer. In short, the three industrial systems, namely, master craftsman, merchant employer and factory, may revolve around the same

22. Under this system the debtor may borrow, for instance, five dollars from the creditor, and pledge to reimburse him a sum of one dollar per month for six months, the first reimbursement commencing 30 days after the making of the loan. At the end of a few months, say three, the debtor is again in financial embarrassment, and is unable to reimburse the creditor with the sum of one dollar required of him for the month. A new loan is then made, of the same amount as the first, from which is deducted the four dollars of the first loan yet unpaid. The debtor, however, pledges again to pay one dollar per month for six months to the creditor commencing 30 days after the making of the second.

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person under different economic circumstances. This, however, is not so in the sewing branch of machine knitting, and the crochet knitting branch. In these two branches, where almost a thousand workers, mainly females, are employed, the merchant employer and the middleman systems prevail. In crochet knitting, the outworker may receive the yarn from the merchant employer--the miniature department store (廣貨鋪) or the hat shop, and knit it up into any kind of hosiery articles designated by the merchant employer on a piece rate basis. She may receive the work from a middleman, however, when the merchant employer is unable to distribute the work himself because of distance or other considerations. This arrangement applies similarly to the sewer, although she does not receive yarn, but unsewn hose, from the knitting establishments, directly or indirectly through the middleman.

#### Labor, capital, rent, machine, raw materials and output.

According to the investigation undertaken by the Committee in 1929, and directed by the present writer, there were 154 knitting establishments in Tientsin, of which 120 were organized before 1929.<sup>23</sup> Of these establishments, only five employed no worker. The other 149 establishments, employing various number of workers, are classified in Table 11. According

**Table 11. Tientsin knitting establishments classified  
by number of workers employed, 1929**

No. workers per establish- ment	No. establish- ments	Total no. workers	No. workers per establish- ment	No. establish- ments	Total no. workers
1 - 5	41	144	31 - 35	2	70
6 - 10	55	429	36 - 40	-	-
11 - 15	27	359	41 - 45	1	43
16 - 20	12	225	46 - 50	-	-
21 - 25	6	137	Above 50	2	115
26 - 30	3	88	Total	149	1,610

to this table, the knitting establishments in Tientsin are mostly small, employing not more than thirty persons each. 1,382 workers, or 86 per cent of the total, are found in establishments having thirty or fewer persons each. Only five establishments, employing 228 workers, have over thirty persons each, but do not qualify as factories in the sense that factories are defined under the new Factory Law, because of their failure to employ power machinery. The number of workers, however, is not a sufficiently representative index in measuring the size of knitting establishments, especially in regard to the large ones. The

23. This return by the Committee may not have included all the knitting establishments there were in Tientsin, especially in view of the difficulty to locate the smaller ones. But it represents about eighty percent of them.

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latter class of establishments are engaged not only in knitting, but also in marketing. In Table 12 it may be observed that most of the establishments having a capital of over 2,000 dollars each belong to this class. Ac-

**Table 12. Tientsin knitting establishments classified  
by amount of capital invested, 1929 (in dollars)**

Capital per establish- ment	Number of establish- ments	Total capital	Capital per establish- ment	Number of establish- ments	Total capital
100 or below	22	2,030	1,001 - 2,000	13	23,700
101 - 200	21	4,060	2,001 - 5,000	8	32,000
201 - 300	21	6,250	5,001 -10,000	3	19,000
301 - 400	6	2,400	Above 10,000	3	55,000
401 - 500	33	16,500	Total	150 (a)	180,140
501 - 1,000	20	19,200			

(a) Four establishments give no returns on capital investment.

According to this table 59 percent of the total capital invested in the industry are contributed by 14 establishments, 8 having 2,001-5,000 dollars each, 3 having 5,001 to 10,000 dollars each, and 3 having over 10,000 dollars each. 103 establishments, about two thirds of the total, have each a capital investment of five hundred dollars or less. Their combined capital, meantime, does not amount to more than twelve percent of the total capital invested in the industry.

The fixed investment of a knitting establishment consists chiefly in machinery, not in building. With the exception of five establishments, the other 149 have their premises rented from outside proprietors. These buildings are mostly small and crowded, with little outlet for ventilation. Most of the small establishments occupy only two rooms, which accommodate somewhere from five to ten persons. These rooms serve not only as workshop, but also as business office, storehouse, kitchen, dining hall and bedroom. In one of the many small establishments visited by the present writer, the wife of the owner, manager, foreman and worker was sitting on an elevated ground, by the side of which were two and three apprentices, standing, knitting hoses or winding bundles of yarns into spools. This room, about eight feet square, was filled with repulsive odor, and covered with muddy floor. A small window and a side door, which were closed most of the time because of winter cold, served as the only outlet for ventilation. The elevated ground, by the way, was the bed for the manager and his wife. The other workers, chiefly apprentices, slept in the next room of the same size, which was also a workroom. By the side of the bed was the kitchen, composed of a small brick oven and a pan above it. In the middle of the room finished hoses and wound yarns

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were piled on a hanging board—a miniature storehouse for the establishment. Outside these two workrooms, there was a small courtyard filled with dyed hoses exposed to the sunlight and air for drying. This picture of a small establishment is not exaggerated, but typical of many other establishments operating on a similar scale. In fact, such establishments are oftentimes concentrated in a few compounds in the poor districts of Tientsin, in cheap rent-paying quarters; and, as shown in Table 13, do not pay an annual rent of more than three hundred dollars each. Only thirty establishments, comparatively larger in size, pay an annual rent in excess of this amount.

**Table 13. Tientsin knitting establishments classified  
by amount of annual rent paid, 1929 (in dollars)**

Annual rent per establish- ment	No. establish- ments	Total rent paid	Annual rent per establish- ment	No. establish- ments	Total rent paid
Below 100	22	1,416	601 - 700	1	700
101 - 200	50	7,202	701 - 800	3	2,160
201 - 300	47	11,790	801 - 900	2	1,730
301 - 400	9	3,252	901 -1,000	2	1,960
401 - 500	8	3,596	Above 1,000	1	1,960
501 - 600	4	2,340	Total	149*	37,696

\* Five establishments do not rent but use own premises.

The knitting machines, whether automatic or semi-automatic, are operated by hand, and constitute the chief fixed investment of a knitting establishment. In the 154 establishments investigated, there are a total of 1,265 knitting machines, including 1,135 circular frames and 130 linear frames. As shown in Table 14, most of these establishments, 78, have one to five machines each. The next largest number, 44, have six to ten machines each. The remainder, 32, have eleven to fifty machines each.

**Table 14. Tientsin knitting establishments classified by  
number of knitting machines employed, 1929**

No. machines per estab't	No. estab'ts	No. machines	No. machines per estab't	No. estab'ts	No. machines
1 - 5	78	252	31 -35	1	34
6 -10	44	354	36 -40	2	76
11 -15	11	129	41 -45	-	-
16 -20	12	214	46 -50	2	99
21 -25	2	49	Total	154	1,265
26 -30	2	58			

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These machines, it may be noted, include only those that were employed at the time of the Committee's investigation. As the investigation was undertaken at a time of rather slack business in the industry, this number, 1,265, represented about eighty percent provided those unemployed were also taken into account. The total number of machines in the 154 establishments, therefore, would have amounted to 1,581. On the basis of an average price of thirty dollars per machine these 1,581 knitting machines may be valued at a total cost of 47,430 dollars. Besides the machines, the accessories, such as needles, irons and ironing boards, bobbins and winding wheels, and dyeing pans, may be valued at one tenth of the cost for the machines, namely, 4,743 dollars. The total cost for the machines and accessories, therefore, reaches 52,173 dollars.

A brief review of the statistics on capital investment, rent, machinery and number of workers would be incomplete without some mention of the quantity and value of output and raw materials consumed. According to the Committee's investigation the 154 establishments in Tientsin consumed 963,674 dollars' worth of raw materials, in 1929 chiefly cotton and woolen yarn, and produced altogether 495,778 dozens of hosiery articles, including 454,186 dozens of hoses. In Tables 15, 16 & 17, the size of 154 establishments is measured by the value of raw materials consumed as well as the value and quantity of output. In respect of the quantity of output only the quantity of hoses produced, in term of dozens, is taken as the basis of comparison, as other hosiery articles, such as sweaters and pants, are small in amount and cannot be reduced to a tolerably common unit for comparative purposes. In these tables it may be noted that

**Table 15. Tientsin knitting establishments classified by the value of raw materials consumed in 1929 (in dollars)**

Value per establish- ment	No. establish- ments	Total value	Value per establish- ment	No. establish- ments	Total value
Below 500	20	6,146	8,001 - 9,000	1	8,810
501 - 1,000	21	16,769	9,001 -10,000	3	28,228
1,001 - 2,000	26	38,691	10,001 -20,000	14	179,763
2,001 - 3,000	17	41,441	20,001 -30,000	9	212,858
3,001 - 4,000	11	39,450	30,001 -40,000	1	38,850
4,001 - 5,000	8	36,011	40,001 -50,000	1	45,960
5,001 - 6,000	12	66,813	Above 50,000	2	148,524
6,001 - 7,000	4	25,642	Total	154	963,674
7,001 - 8,000	4	29,718			



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**Table 16. Tientsin knitting establishments classified by the quantity of hoses produced in 1929 (in dozens)**

Output per establishment	No. establishments	Total output	Output per establishment	No. establishments	Total output
Below 500	29	9,614	6,001 - 7,000	5	33,500
501 - 1,000	27	21,510	7,001 - 8,000	4	31,130
1,001 - 2,000	28	43,622	8,001 - 9,000	1	8,550
2,001 - 3,000	21	53,850	9,001 - 10,000	1	10,000
3,001 - 4,000	14	50,490	Above 10,000	5	115,340
4,001 - 5,000	9	41,820	Total	150*	454,186
5,001 - 6,000	6	34,760			

\* Of the 154 establishments 4 produced no hoses, but other articles.

**Table 17. Tientsin knitting establishments classified by the value of output in 1929 (in dollars)**

Value per establishment	No. establishments	Total value	Value per establishment	No. establishments	Total value
Below 500	5	1,115	8,001 - 9,000	5	43,342
501 - 1,000	15	11,004	9,001 - 10,000	6	56,508
1,001 - 2,000	23	34,066	10,001 - 20,000	20	262,778
2,001 - 3,000	15	37,238	20,001 - 30,000	7	185,546
3,001 - 4,000	16	58,377	30,001 - 40,000	11	396,803
4,001 - 5,000	8	34,831	40,001 - 50,000	1	41,228
5,001 - 6,000	5	27,490	Above 50,000	7	556,872
6,001 - 7,000	8	52,192	Total	154	1,813,650
7,001 - 8,000	2	14,260			

most of the 154 establishments, 84 in number, consumed raw materials at a value of three thousand dollars or less each. Jointly they consumed a total value of only 103,047 dollars, a little less than eleven percent of all the raw materials consumed by the industry as a whole. In respect of the quantity of output, the same number of establishments, 84, produced during 1929 2,000 dozens or less of hoses each. Jointly they produced a total quantity of only 74,746 dozens, approximately sixteen percent of the whole output for the industry. In respect of the value of output, 82 establishments produced during 1929 5,000 dollars or less worth of hosiery articles each. Jointly they produced 176,631 dollars worth of hosiery articles, or 9.7 percent of the total value of output for 154 establishments. As the cost for the output amounted only to \$1,374,465, or 75.8% of the selling value, the net profit, therefore, could be fixed at 24.2%. In Tables 18 and 19 the distribution of 154 knitting establishments according to the cost of output, as well as the detailed analysis of the cost items, are given. According to these tables, the

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**Table 18. Tientsin knitting establishments classified by the cost of output, 1929 (in dollars)**

Cost per establishment	No. establishments	Total cost	Cost per establishment	No. establishments	Total cost
Below 500	10	3,090	8,001 - 9,000	5	42,180
501 - 1,000	21	15,295	9,001 -10,000	5	47,705
1,001 - 2,000	21	32,757	10,001 -20,000	15	281,969
2,001 - 3,000	14	33,733	20,001 -30,000	14	345,486
3,001 - 4,000	17	58,613	30,001 -40,000	5	173,770
4,001 - 5,000	6	30,880	40,001 -50,000	3	135,867
5,001 - 6,000	9	51,284	Above 50,000	1	57,300
6,001 - 7,000	2	19,190	Total	154	1,374,465
7,001 - 8,000	6	45,346			

**Table 19. Total cost of production for 154 knitting establishments in Tientsin, 1929 (in dollars)**

Item of cost	Amount	Percent
Raw materials	968,674	70.1
Wages	332,141	24.2
Supervision (1)	27,720	
Knitting etc. (2)	253,092	
Sewing (3)	34,064	
Dyeing (4)	7,046	
Ironing (5)	10,219	
Interest (6)	18,014	1.3
Rent	37,696	2.7
Depreciation charges	11,479	0.8
Machinery & accessories (7)	10,435	
Fixtures (8)	1,044	
Tax (9)	3,770	0.3
Light, water, etc. (10)	3,770	0.3
Miscellaneous	3,921	0.3
Total	1,374,465	100.0

1. At an average monthly salary of \$15 each for 154 managers.
2. At an average monthly wage of \$13.1 each for 1,610 workers, including money wage and money equivalents of free board.
3. At 10 cents per dozen for 340,640 dozens of hoses.
4. Only 34 establishments had dyeing done by dyeworks. The other 120 establishments performed dyeing at own premises.
5. At three cents per dozen for 340,640 dozens of hoses.
6. At 10 % of the capital invested.
7. At 20 % of the cost.
8. At 10 % of the depreciation charges for machinery and accessories.
9. Including shop license, police assessment, assessments for street light and cleaning, and special taxes of an irregular nature such as the military tax.
10. At 10% of the annual rent paid.

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running costs, including raw materials and wages, occupy 94.3%, while the fixed costs, including interest, rent, depreciation charges, tax, light and water, and miscellaneous, 5.7%.

### The Middleman

The employment of middlemen (背包或散活人) for the distribution of work among sewers and crochet knitters is a common feature in the hosiery knitting industry in Tientsin. Some establishments have their hoses sewn by indoor workers, generally women and girls, but most of them delegate such work to outworkers in order to dispense with the provision for workshop. Again, the knitting of woollen hosiery, especially mufflers, scarfs, gloves, caps, shoes, and sweaters, by means of hand rather than of machinery, is being carried on in Tientsin as elsewhere, at the homes of outworkers. In both cases, the work, given out either by hosiery knitting establishments or by miniature department stores, is distributed to the outworkers by the middlemen. In Tientsin there are about 150 middlemen, of whom the Committee has made a sample survey of 23, engaged in distributing work for sewers. The extent of business for these twenty-three middlemen, in term of the dozens of hoses distributed during the year 1929, is as follows: 2 distributed 2,001-2,500 dozens each; 1, 2,501-3,000 dozens; 3, 3,001-3,500 dozens; 3, 3,501 to 4,000 dozens; 5, 4,001-4,500 dozens; 3, 4,501-5,000 dozens; 3, 5,001-6,000 dozens; 1, 6,001-7,000 dozens; and 2, 9,001-10,000 dozens. These twenty-three middlemen distributed altogether 106,076 dozens of hoses in 1929, or an average of 4,612 dozens per middleman. As the total output for 154 knitting establishments in 1929 amounted to 454,186 dozens, these twenty-three middlemen distributed but 23.4 percent of the total output. Of the other 76.6 percent about one half must have been distributed by other middlemen, the rest being sewn within the establishments, or given out to the sewers directly.

Of these twenty-three middlemen, twenty-one were natives of Hopei province. Among the different hsien in Hopei, Tientsin supplied eleven middlemen, chiefly because of the fact that the knitting establishments were located there. Twenty-one middlemen were men, only two being women. The preponderance of men over women in this respect is rather uncommon in the industrial experience of other nations, such as England, for in English industries organized under similar systems, the female middlemen exceeded the male in number. In China the social conditions are such that women do not often resort to profitable employment. In age distribution there were one middleman in 26-30 group, 3 in 31-35 group, 6 in 36-40 group, 3 in 41-45 group, 6 in 46-50 group, 3 in 51-55 group, and 1 in 56-60 group. Most of them, therefore, were advanced in age, and had been engaged in distributing hoses for various years ranging from three to ten. One of them started in 1920, 4 in 1921,

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2 in 1922, 3 in 1923, 3 in 1924, 3 in 1925, 3 in 1926, and 4 in 1927. Not all of these middlemen, however, were fully employed in distributing hoses throughout the year, chiefly due to the seasonal nature of the occupation. Accordingly, ten of them had also the following by-employments: 4 in hosiery knitting, 2 in brokerage, 2 in peddling, 1 in farming and 1 in carpentry. The earnings derived from distributing hoses varied for different middlemen, but with one single exception, they did not exceed two hundred dollars each: 3, below 50 dollars; 7, below 100 dollars; 9, below 150 dollars; 3, below 200 dollars; and 1, below 250 dollars. The total earnings derived from distributing hoses for the twenty-three middlemen amounted to 2,551 dollars, or an average of 111 dollars each. The latter is indeed a small income for the middlemen, which, as we have seen, had to be supplemented by revenues from the by-employments in ten out of twenty-three cases. It represented, however, 32 percent of the total wages paid by the hosiery knitting establishments to the middlemen for sewing. The sewers, in other words, received but 68 percent, or 8,057 dollars.

Each middleman did not always employ the same number of sewers, varying from the lowest of four to the highest of thirteen: 2 middlemen employed 4 each; 2 middlemen, 5 each; 7 middlemen, 6 each; 5 middlemen, 8 each; 4 middlemen, 10 each; 2 middlemen, 12 each; and one middleman, 13. These 23 middlemen employed a total of 177 sewers, or an average of 7.7 sewers per middleman.

The mode of distributing work to the 177 sewers varied: 134 sewers received it from the middleman at home, while the other 43 went to the middleman's home for it. The number of times for which the sewers received the work or went to the middleman's home for it is not uniform, but the commonest is ten, fifteen or twenty times per month. It was during these times that most of the sewers turned back the hoses already sewn, and in return had their wages paid by the middleman. The mode of paying wages also varied, according to the economic conditions of the sewers, once every half month or once every month, besides paying wages at the moment when the work was turned back to the middleman. In receiving the work already sewn by the middleman the latter customarily examined it with care, and demanded compensation from the sewers for any hose poorly sewn or otherwise spoiled, which was deducted directly from the sewers' wages. In this respect the middleman, unlike the out-worker, was paid by the establishment in longer intervals, such as the first and the fifteenth day of the month according to the lunar calendar, the three festivals during the year including the Dragon Festival, the Moon Festival and the New Year, although the practice of payment at the return of the work sewn was not uncommon.

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The middleman, in distributing hoses among the sewers, generally depends upon two classes, namely, the casual and the regular sewers. The regular sewers, chiefly members of poor families, were regularly supplied with work by the middleman, and could be relied upon for sewing throughout the year. To them sewing no longer became a sideline to household duties; it constituted an important means of livelihood. On the other hand, the casual sewers might work and quit at any moment; it was only when the middleman was pressed for work during busy seasons that this class was resorted to for additional help. To them the income derived from sewing constituted but a source of pin money.

Such, then, is the middleman system in the sewing branch of the hosiery knitting industry in Tientsin. From the viewpoint of the hosiery knitting establishments, the chief advantage from the employment of middlemen lies in its flexibility. A middleman, unlike a regular employee on the staff, can be hired or fired at any moment, according to business conditions. In hosiery knitting industry in particular, where the fluctuation of business has been quite marked recently because of the frequent occurrence of warfare, this advantage is a primary consideration in favor of the middleman system. On the other hand, the middleman system often results in the exploitation of outworkers through the payment of unreasonably low wages. The outworkers, as a consequence, delay the execution of the work and thereby prevent the realization of a higher stock turnover to the establishment.

In some knitting establishments, sewing is either performed by female labor within the establishment, or given out to sewers directly. The latter arrangement is possible with establishments operating on a small scale, but even here the trouble of having to deal with so many outworkers instead of one or two middlemen constitutes a serious disadvantage.

### **The Outworker**

The outworkers under the middleman system, including the sewers and crochet knitters, form a majority of the working population in the two branches of the hosiery knitting industry in Tientsin, whether by hand or by machinery. However, their actual number is hard to determine, even through the process of census taking, as they are generally scattered all over the city and suburbs. Furthermore, it is fluctuating, on account of the seasonal nature of their occupation. Under such circumstances the next best course to take is to estimate their extent on the basis of data available. With regard to the number of sewers, such estimate may be drawn from two sets of data, namely, the total output of hoses produced within the year and the average amount of hoses sewn by each outworker. The hoses (cotton, woollen, and rayon) produced in 1929, for the 150 knitting establishments, amount to 454,186 dozens; while those

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sewn per outworker in 1929 can be calculated from the returns given by the twenty-three middlemen referred to above. According to the latter, these middlemen distributed a total of 106,076 dozens of hoses among 177 outworkers in 1929, or an average of 599 dozens per outworker. Granted that one fourth of the 454,186 dozens of hoses produced in 1929 were sewn within the establishments, the other three fourths, or 340,640 dozens, must have been sewn by the outworkers. As each outworker could sew 599 dozens on an average, 340,640 dozens must have required a total of 569 outworkers. The number of crochet knitters, on the other hand, cannot be similarly determined like that of the sewers. The crochet knitters, unlike the sewers, either received work from the hat shops and miniature department stores, or purchased yarns for knitting on own account. At least seventy percent, if not more, belonged to the former class. There were, according to a recent investigation completed by the Social Affairs Bureau of the Special Municipality of Tientsin, a total of 453 miniature department stores and 113 hat shops in the Municipality.<sup>24</sup> Not all of these shops and stores gave out yarns to the crochet knitters for knitting, but it is certain that those that did could at least keep two knitters at work constantly. Estimating on the basis that one half of these stores and shops could supply work to two knitters, the total number of crochet knitters in Tientsin would have amounted to a minimum of 566. The latter, added together with the 569 sewers, gives a total of 1,135 sewers and crochet knitters in the hosiery knitting industry in Tientsin.

Of a total of 1,135 sewers and knitters, the Committee has made a sample study of 200, including 110 sewers, 81 crochet knitters, and 9 sewer-knitters. Of the two hundred sewers and crochet knitters, the majority, 138, were natives of Tientsin, while the other 62 came from various hsien in the province of Hopei, namely, 11 from Wen An, 8 from Chi, 8 from Nan Pi, 7 from Tsing Hai, 6 from Nan Kung, 5 from Wu Ch'ing, 5 from Ts'ang, and 12 from other nine hsien. All of the two hundred outworkers were females, of whom 98, or one half, fell below twenty-one years of age, and, with the exception of two, were unmarried. On the other hand, among the 95 outworkers who were married, two thirds, or 63, fell within the age group of 36-50. The concentration of the outworkers in these two age groups, 98 below 21 years of age and 63 between the age of 36 and 50, can be easily explained. The first group, being unmarried, were composed of young girls who had plenty of spare times at disposal for sewing or crochet knitting. The second group, although married, had passed beyond the period of child-bearing, and could there-

24. Social Affairs Bureau of the Special Municipality of Tientsin, *Annual Report*, (August, 1928 to July, 1927), p. 796 et seq.

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fore devote the time spared by child-rearing and other household duties to by-employments. In Table 20 the detailed distribution of the 200 outworkers, according to age and marital status, is given.

**Table 20. 200 outworkers in Tientsin knitting industry  
classified by age and marital status, 1929**

Are	Married	Single	Total	Are	Married	Single	Total
11-15	—	11	11	36-40	28	—	28
16-20	2	85	87	41-45	23	—	23
21-25	3	9	12	46-50	12	—	12
26-30	19	—	19	51-55	1	—	1
31-35	7	—	7	Total	95	105	200

The size of the outworker's family varied from the lowest of two persons to the highest of nine, the commonest being three to five persons. The average size of family for the two hundred outworkers, however, is 4.4 persons.<sup>25</sup>

**Table 21. Size of outworkers' families in Tientsin  
knitting industry, 1929**

No. persons per family	No. families	No. persons	No. persons per family	No. families	No. persons
2	14	28	7	11	77
3	40	120	8	—	—
4	50	200	9	1	9
5	63	315	Total	200	875
6	21	126			

The age and sex distribution of the family members, including the outworkers, is shown in Table 22. The preponderance of females over males, especially in the age group of 16-20, is easily explained by the peculiar nature of the families here chosen. As 105 of the 200 outworkers, a little more than one half, were unmarried young girls of 25 years of age or below (85 outworkers being 16-20 years old), the families to which this class of unmarried young girls belonged obviously formed a special group by itself, and became biassed to the same extent.

25. Children not converted into adults in this case. Cf. *infra*, p. 39.

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Table 22. Members of outworkers' families classified by age and sex, 1929

Age	Male	Female	Total	Age	Male	Female	Total
1 - 5	4	2	6	41 - 45	49	53	102
6 - 10	17	12	29	46 - 50	39	46	85
11 - 15	54	68	122	51 - 55	12	12	24
16 - 20	52	170	222	56 - 60	4	8	12
21 - 25	34	22	56	61 - 65	5	11	16
26 - 30	22	27	49	66 - 70	4	12	16
31 - 35	16	14	30	Total	360	515	875
36 - 40	48	58	106				

26. Of the 200 families, only 199 give returns on expenditures.

With the exception of fourteen outworkers the rest had one to three other members of the family gainfully employed in different occupations. By far the largest number, 135 outworkers, had one other member in the family gainfully employed; 42 outworkers had two other members in the family gainfully employed; and 9 outworkers had three other members in the family gainfully employed. There were, therefore, a total of 246 other members of the 186 outworkers' families gainfully employed in different occupations as follows: 133 in trade, 64 in industry, 20 in transport, 15 in domestic service, and 14 in other fields. These 246 members of the 186 outworkers' families earned a total of \$37,480 in 1929, or an average annual earning of \$152.3 per family member. By far the largest number, 100, had an annual earning of \$101-150 each; that for the rest being as follows: 16, below \$50; 36, \$51-100; 50, \$151-200; 36, \$201-300; 8, above \$300. In age distribution, the number of family earners increased steadily from 27 in 16-20 group, 56 in 21-30 group, 63 in 31-40 group, to 82 in 41-50 group; it then declined to 14 in 51-60 group, and to only 4 in above 60 group. It is therefore plain that for the outworkers' family members, the annual earning was generally small, and that the most productive age fell within the range of 41 to 50.

With respect to the income and expenditure of the outworkers' families,<sup>26</sup> Tables 23, 24 and 25 give interesting statistics. From Table 23 it may be noted that for the four income groups listed, earnings constituted from 94.3 to 98.4 percent of the total income. The share of the outworkers' earnings, however, decreased as the size of family income increased; 40.3% for \$200 or below group, 25.8% for \$201-\$300 group, 23.7% for \$301-\$400 group, and finally, 12.5% for \$401-\$500 group. This table may be further examined in the light of Table 25, in which the surplus or deficit of the outworkers' family budgets is shown. It is significant to note that as the income of a family increased, there was a tendency towards surplus, and vice versa. Thus, there were 9 surplus and 55 deficit families in \$200 or below group, 25 surplus and 40 deficit



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families in \$201-\$300 group, 25 surplus and 18 deficit families in \$301-\$400 group, and 17 surplus and 6 deficit families in \$401-\$500 group.

With regard to the expenditure of the outworkers' families, that for food, as given in Table 24, coincided closely with the laws as first formulated by Engel.<sup>27</sup> In term of percentages, the expenditure for food decreased from 61.3% for \$200 or below group, 59.4% for \$201-\$300 group, 54.7% for \$301-\$400 group, to 47.6% for \$401-\$500 group. The expenditure for clothing was one half lower than that for Engel's families, but remained approximately the same for all the four income groups: 7% for \$200 or below group, 7.4% for \$201-\$300 group, 6.7% for \$301-\$400 group, and 8.4% for \$401-\$500 group. The expenditure for rent was roughly the same for all the four income groups, but a little higher than that for Engel's families, about two percent. The expenditure for fuel and light also remained unchanged for the four income groups, but was lower by one percent than that for Engel's families. The expenditure for miscellaneous items, finally, increased with the increase in family income, as was also true with Engel's families. It increased from 11.2% for \$200 or below group, 14.2% for \$201-\$300 group, 18.7% for \$301-\$400 group, to 24.6% for \$401-\$500 group.

**Table 23a. Sources of income for 200 outworkers' families classified by income groups, 1929 (in dollars)**

Source of income	\$200 or blow	\$201-\$300	\$301-\$400	\$401-\$500
<b>Earnings</b>				
Outworkers'	4,363	4,256	3,687	1,474
<b>Other members'</b>				
Fully employed	5,698	11,474	11,162	9,146
Partly employed	384	160	455	500
<b>Non-earnings</b>				
Rent, etc.	146		170	340
Interest		255		300
Charity	234	340	70	20

27. Engel's table of proportionate expenditures is reproduced as follows in Streightoff, *The standard of living among the industrial people in America*, Boston and New York, 1911, p. 12.

Item	Percentage of the expenditure for family of a man with income of		
	\$225-\$300	\$450-\$600	\$750-\$1,000
Subsistence	62	55	50
Clothing	16	18	18
Lodging	12	12	12
Firing & lighting	5	5	5
Education, religion, etc.	2	3.5	5.5
Legal protection	1	2.0	3.0
Care of health	1	2.0	3.0
Comfort, recreation	1	2.5	3.5

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Table 23b. Sources of income for 200 outworkers' families classified by income groups, 1929 (in percentages)

Source of income	\$200 or below	\$201-\$300	\$301-\$400	\$401-\$500
Earnings	96.5	96.4	98.4	94.3
Outworkers'	40.3	25.8	23.7	12.5
Other members'	56.2	70.6	74.7	81.8
Non-earnings	3.5	3.6	1.6	5.7
Rent, etc.	1.3		1.1	2.9
Interest		1.5		2.6
Charity	2.2	2.1	0.5	0.2

Table 24a. Expenditures of 199 outworkers' families classified by size of income, 1929 (in dollars)

Item of expenditure	\$200 or below	\$201 to \$300	\$301 to \$400	\$401 to \$500
Food	127.4	154.2	185.5	235.2
Rent	34.6	40.3	56.8	75.1
Clothing	14.5	19.1	22.7	41.5
Fuel and Light	8.1	9.0	10.8	20.6
Miscellaneous	23.4	37.1	63.6	121.5
Gifts	7.0	10.3	16.6	30.4
Toilet articles	4.6	7.2	12.6	21.5
Water	4.2	4.8	6.0	9.5
Recreation	3.5	6.0	10.0	14.6
Education	2.5	3.4	3.5	4.0
Health	1.3	2.4	5.4	13.3
Worship		.3	.7	1.7
Tax		.1	1.3	1.3
Funeral and Wedding		.1		16.4
Other	.3	2.5	7.5	8.8
Average income	169.1	246.0	345.4	512.2
Average expenditure	208.0	259.7	339.4	493.9
Surplus (+) or Deficit (-)	-38.9	-13.7	+6.0	+18.3
Average size family (Adult males) <sup>28</sup>	3.1	3.7	4.0	4.8
Number of families	64	67	45	23

28. In computing the adult males, the Atwater scale is adopted.

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**Table 24b. Expenditures of 199 outworkers' families classified by size of income, 1929 (in percentages)**

Item of expenditure	\$200 or below	\$201 to 300	\$301 to 400	\$401 to 500
Food	61.3	59.4	54.7	47.6
Rent	16.6	15.5	16.7	15.2
Clothing	7.0	7.4	6.7	8.4
Fuel and light	3.9	3.5	3.2	4.2
Miscellaneous	11.2	14.2	18.7	24.6
Gifts	3.4	4.0	4.9	6.2
Toilet articles	2.2	2.8	3.7	4.4
Water	2.0	1.8	1.8	1.9
Recreation	1.7	2.3	2.9	3.0
Education	1.2	1.3	1.0	.8
Health	.6	.9	1.6	2.6
Worship		.1	.2	.3
Tax			.4	.3
Funeral and Wedding				3.3
Other	.1	1.0	2.2	1.8
Average income	\$169.1	\$246.0	\$345.4	\$512.2
Average expenditure	\$208.0	\$259.7	\$339.4	\$493.9
Percent of income spent	123%	106%	98%	96%
Average size family (Adult males)	3.1	3.7	4.0	4.8
Number of families	64	67	45	23

**Table 25. Distribution of surplus and deficit for 195\* outworkers' families, 1929**

Amount of surplus or deficit (in dollars)	Income group							
	\$200 or below		\$201-\$300		\$301-\$400		\$401-\$500	
	No. families having		No. families having		No. families having		No. families having	
	Sur-plus	Defi-cit	Sur-plus	Defi-cit	Sur-plus	Defi-cit	Sur-plus	Defi-cit
20 & below	5	17	12	13	10	8	4	2
21 - 40	2	12	8	13	7	4	3	1
41 - 60	2	6	3	8	4	4	1	1
61 - 80	0	9	2	2	3	1	3	0
81 - 100	0	7	0	1	0	1	1	1
100 or above	0	4	0	3	1	0	5	1
Total	9	55	25	40	25	18	17	6

\* Four families have neither surplus nor deficit.

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Coming back again to the outworkers, we may examine the nature of work and the conditions under which it is being performed. The work of the sewers consisted chiefly in sewing the unfinished socks and stockings given out by the hosiery knitting establishments, on a piece work basis. The rate for sewing varied for different classes of socks and stockings, depending upon the kind of raw materials used, the number of needles, and the kind of uses, whether for women and children, or for men. It also differed according to the skill of the outworkers, and the degree of exploitation by the middleman. The rate was usually fixed for every dozen of socks or stockings, in term of coppers, one copper being equivalent to about three-tenths of a silver cent according to the current quotation. The following list gives the different rates for sewing cotton socks and stockings in Tientsin, as paid by the middleman.

Rate (in coppers) for sewing one dozen of different kind of socks or stockings

Number of needles	Adult		Child
	Male	Female	
72			23
80			28
160	27	23	
180	32	28	
240	36	34	

The rate for sewing woolen hosiery was a little lower, because of the smaller number of needles as well as of the facility of performance.

The amount of hoses that each outworker could sew every day varied with the number of hours devoted to the work and her skill. As an average, each outworker spending eight hours a day could sew two dozens of hoses designed for the male adults, earning a total of a little less than twenty cents. As the work for sewing could be obtained with slight fluctuations throughout the year, it furnished a regular supplementary income to the outworker's family.

The crochet knitter, on the other hand, performed a more difficult task than the sewer, and was on that account better paid. She did not always confine herself to the knitting of one article alone, but to many articles such as scarfs, mufflers, sweaters, shoes, gloves and caps. The article knit, furthermore, might be plain or ribbed, with or without fingers. The rate, therefore, varied more considerably than that for sewing. In most cases the articles knit required woolen yarns, not cotton, whereas in sewing, cotton rather than woolen or rayon hoses constituted the majority. For this reason the work was available only during fall and winter, and the outworkers occasionally filled up the gap by resorting to sewing. The following list gives the rate for knitting different articles in Tientsin, in

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term of coppers or silver dollars. In knitting the rate is quoted for every bundle (拮) of woolen yarn for certain articles, each bundle being equivalent to one sixteenth of a pound.

Kind of knit article	Rate for knitting (in coppers or silver dollars)
Muffler: Plain	14 coppers per bundle
Ribbed	20 " " "
Scarf	16 " " "
Cap	7-8 " " "
Shoe	0.30-0.50 dollars per pair
Sweater: Plain	2.10 dollars each
Ribbed	2.50 " "
Gloves: With fingers	7 coppers per bundle
Without fingers	5 " " "

In the above list mufflers and caps formed about 70% of all the articles knit in Tientsin; scarfs (larger than mufflers, for woman use) and gloves, 20%; sweaters and shoes, 10%.

With regard to the regularity of employment, most sewers and crochet knitters investigated, 149, were continuously engaged throughout the months during which they were supplied with work. Among the other 51 outworkers, two worked 15 days per month; one, 18 days; forty, 20 days; eight, 25 days. The number of months during which the sewers and crochet knitters were supplied with work varied from three to twelve, but more than one half of them, 110, fell within the twelve month group. The next largest number, 75, worked six months; the rest working as follows: one worked three months; five, four months; three, five months; two, seven months; four, ten months. The working hours per day, finally, were not always uniform. All of the outworkers, 200, worked in day time, while 165, or more than three fourths, worked during night as well. The total number of hours worked per day for each of the 200 outworkers, whether in day time or in day and night together, is shown in Table 26. According to this table the commonest number of hours worked per day varied from eight to ten, which coincided closely with the mean, 9.42. In this connection it may be observed that for 86 of the 200 outworkers, a part of the day's time had to be devoted to household duties. Of these 86 outworkers there were 3 young girls and 83 married women working from six to fifteen hours per day either in sewing or in crochet knitting: seven worked 6 hours; eight, 7 hours; twenty-one, 8 hours; fifteen, 9 hours; fifteen, 10 hours; eight, 11 hours; seven, 12 hours; two, 13 hours; two, 14 hours; and one, 15 hours.

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Table 26. 200 outworkers classified by number of working hours per day (or day-and-night), 1929

No. hours per day (or day-and-night)	No. outworkers	Total no. hours	No. hours per day (or day-and-night)	No. outworkers	Total no. hours
5	2	10	12	22	264
6	11	66	13	7	91
7	18	126	14	5	70
8	46	368	15	2	30
9	35	315	16	-	-
10	34	340	17	1	17
11	17	187	Total	200	1,884

The irregularity of employment among the 200 outworkers with respect to the number of hours per day, the number of days per month, and the number of months per year, as well as the difference in the nature of work performed, give rise to a considerable variation in the amount of annual earnings received. The commonest earnings per year, as shown in Table 27, varied from 31 to 90 dollars, applicable to three fourths of

Table 27. Distribution of 200 outworkers' annual earnings by number of months worked in 1929

Earnings (in dollars)	12	10	7	6	5	4	3	Total
11 - 20				2				2
21 - 30	2			5	1	1		9
31 - 40	4			11	1	1	1	18
41 - 50	22	1		13		1		37
51 - 60	19		1	17		1		38
61 - 70	12		1	3				16
71 - 80	15	1		11		1		28
81 - 90	8			3	1			12
91 - 100	7	1		1				9
101 - 110	5			5				10
111 - 120	6			3				9
121 - 130	2			1				3
131 - 140		1						1
141 - 150	2							2
151 - 160	2							2
161 - 170	1							1
171 - 180	2							2
181 - 190								
191 - 200	1							1
Total	110	4	2	75	3	5	1	200

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the 200 outworkers. Considering the average number of hours worked by these outworkers per day, namely, 9.42, this earning was certainly a small return for the amount of labor spent. It is because the occupation is supplementary that the wages paid are reduced to such a low level.

The earnings of the outworkers, however small, constituted from eleven to forty percent of the total income of their respective families in 148 cases, a little less than three fourths of the total. For 7 outworkers' families such earnings formed the only source of family income. In Table 28 it may be noted that the larger the size of income for outworker's family, the smaller the percentage of outworker's earnings contributed.

**Table 28. Classification of percentages of family earnings contributed by outworkers by size of outworkers' family income, 1929**

Percentage from outworkers' earnings	Size of outworkers' family income (in dollars)				Total
	200 or below	201-300	301-400	401-500	
1 - 10		3	5	5	13
11 - 20	4	22	16	12	54
21 - 30	18	20	13	5	56
31 - 40	19	12	6	1	38
41 - 50	7	9	2		18
51 - 60	8	1	2		11
61 - 70	2		1		3
71 - 80					
81 - 90					
91 -100	7				7
Total	65	67.	45	23	200

Finally, the abuses of the outworkers, including sewers and crochet knitters, may be enumerated. Whatever forms such abuses may take, their object is one, namely, illegal acquisition of profit. The substitution of inferior for superior hosiery is possible with some middlemen who give out a large quantity of work, but cannot afford to spare much time in detecting such substitution. Again, the outworker may sell the hosiery, and lie to her middleman that it is lost. The compensation for such loss, if any, is generally insufficient to pay for the manufacturing cost, not to say the selling price. These two forms of abuses apply to sewers as well as to crochet knitters. Other abuses, however, apply to the latter only. The crochet knitters, unlike the sewers, may embezzle the woolen yarns given her by the middleman in various ways. She may, in the first place, embezzle some yarn and then increase its weight either by sprinkling water, or by depositing sand or cigarette wrapping paper, made of tinfoil, in some parts of the knit articles. She may, secondly, knit the articles with fewer number of needles in order to speed up the work, but loosen the texture so as to give the same size to the articles knit.

## Chapter III. Knitting and marketing

### Knitting and knitting frame

Knitting, the art of forming a single thread or strand of yarn into a texture or fabric of a loop structure, by employing needles or wires, is divided into two branches, namely, hand knitting and frame-work knitting. Hand knitting is essentially a domestic art, for which the wires, pins, or needles used are of different lengths or gauges, according to the class of work produced. They are made of steel, bone, wood or ivory. Some are headed to prevent the loops from slipping over the ends. Flat or selvedged work only can be produced on them. Others are pointed at both ends, and by employing three or more a circular or circular-shaped fabric can be made.<sup>29</sup> Frame-work knitting, unlike hand knitting, is a later development, originating with the famous invention of Rev. William Lee in 1589. It is again divided into two branches, namely, flat and circular. In the flat knitting machine, the yarn moves from one side of the frame to the other. Occasionally, however, it is also used for producing a tubular fabric. In order to do this a machine requires two sets of needles, and having knit across one row of needles, it knits back on the other. The flat knitting machine was the first type ever invented, by Lee, and for almost 250 years after his death was the only kind of knitting machine available. A circular machine, which would knit a tube-like fabric, was patented in England in 1816; it was not adopted by the industry until it had been improved by a Belgian inventor, who in 1845 exhibited it to the knitters of England and satisfactorily demonstrated its value. Occasionally, however, a circular machine can also produce a flat instead of tubular article by knitting part way round the circle of needles, then back.<sup>30</sup>

Knitting frames, whether flat or circular, may be operated by hand or power. Power knitting is the prevalent practice in foreign countries, but in China hand knitting is as yet the popular choice, with the exception of a few knitting mills in Shanghai and elsewhere. In Tientsin the circular hand knitting frames, for the production of hoses, are further divided into two types, namely, automatic and semi-automatic. The chief difference between these lies in the requirement of hand work by the latter, in addition to the supply of hand power for the movement of the frame. The automatic machine, which gives greater speed and output, is twice or thrice as expensive as the semi-automatic. It is, however, not so extensively employed as the semi-automatic. In the hosiery knitting industry in Tientsin in 1929, there were altogether 1,103 circular frames for hose knitting, of which only 396, or 36 percent, were automatic. The use of automatic frames is only a recent development. In former years, the

29. *Encyclopaedia Britannica*, Vol. 13, p. 442.

30. Caplin, Jessie F.: *Knitting: Its products and processes*, New York, 1927, pp. 53-55.



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semi-automatic frames had a far stronger hold upon the industry than they do at present.

The hosiery knitting industry in Tientsin, which commenced with the import of knitting frames by an English firm named Chih Tso in 1912, resorted to foreign countries for the supply of knitting frames, first England, and later on Japan. But gradually such frames could also be produced by native manufacturers, first in Shanghai, and then in Tientsin. In the latter place the industry of making knitting frames has been so developed as to boast of 18 establishments in 1929, of which seven were branches of Shanghai establishments. These establishments were organized in different years: one in 1914 and 1916 respectively, two in 1919, one in 1921 and 1924 respectively, two in 1925, six in 1926, one in 1927 and 1928 respectively, and two in 1929. Wang Chi-chung was the first establishment organized in 1914, and Lao Sun Chi (老生記), the second one organized in 1916. Not all of these establishments were engaged in the making of knitting frames; some of them, especially the branches of Shanghai establishments, were purely selling agents. For this reason the capital invested varied a good deal in amount. Chih Dah (志達), the largest, employed a capital of five thousand dollars, next to which was Lao Sun Chi, employing one of three thousand dollars. Two establishments, Hung Tai (a branch) and Ch'un Chü Teh (春聚德), employed a capital of two thousand dollars respectively, while another one, Nan Yang (a branch), employed one of 1,200 dollars. The other thirteen establishments employed a capital below one thousand dollars each: 3 employed \$600, 4 employed \$500, 5 employed \$400 and 1 employed \$300. Altogether these eighteen establishments employed a capital of but \$19,300. With the exception of one partnership, namely, Hung Tai, the other seventeen establishments were all owned by individual proprietors. The number of workers employed reached 181, including 51 staff members, 43 workers and 87 apprentices. The workers and apprentices were employed by 13 establishments only: 87 in 4 establishments employing over 10 each, 26 in 3 establishments employing 6-10 each, and 17 in 6 establishments employing 2-5 each. Of the eighteen establishments, Wang Chi-chung, the earliest to make knitting frames in Tientsin, had given up the original business a few years ago, but undertook to sell needles imported from Japan. The other seventeen establishments may be classified in respect of the kinds of frames produced or sold as follows: four in flat and circular frames of automatic and semi-automatic type, nine in circular frames of automatic and semi-automatic type, and four in circular frames of semi-automatic type. In other words, all of these seventeen establishments produced or sold semi-automatic circular frames. Thirteen establishments produced or sold automatic circular frames, while flat frames could be had only from four establishments. Besides, four of these 17 establish-

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ments were also engaged in the sale of needles. In Table 29, the quantity and value of articles sold by the 18 establishments in 1929 is shown.

**Table 29. The quantity and value of articles sold by knitting frame establishments in Tientsin, 1929**

Name of article	Quantity	Price (in dollars)	Value (in dollars)
<b>Knitting frames</b>			
<b>Circular</b>			
Automatic	678	50.00	33,900
Semi-automatic	1,933	20.00	38,660
Cap	10	40.00	400
Other	56	35.00	1,960
<b>Flat</b>			
Sweater	2	150.00	300
Scarf	6	55.00	330
Other	37	160.00	5,920
<b>Knitting needles*</b>			
Automatic	16,600	2.40	39,840
Semi-automatic	10,920	1.60	17,472
Sewing machines	145	25.00	3,625
Spinning wheels	100	0.80	80
Total			142,487

\* Quoted in term of hundreds.

According to this table the total value amounted to \$142,487 in 1929, which was 7.4 times that of the capital invested by these establishments, namely, \$19,300. In Table 30, these establishments are classified according to the value of the articles sold in 1929.

**Table 30. Tientsin knitting frame establishments classified by the value of articles sold, 1929 (in dollars)**

Value per establish- ment	No. establish- ments	Total Value	Value per establish- ment	No. establish- ments	Total Value
1,001-2,000	2	3,100	6,001-7,000	2	12,440
2,001-3,000	3	7,400	7,001-8,000	1	7,035
3,001-4,000	1	3,022	8,001-9,000	1	8,940
4,001-5,000	3	14,800	Above 9,000	3	73,970
5,001-6,000	2	11,780	Total	18	142,487

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The price for the articles listed in Table 29 represents the average; it varies with the different establishments even for the same article. In Tientsin it is the practice for each of the establishments to issue a price list for its own products, of which that given in Table 31 by Lao Sun Chi, one of the oldest establishments, serves as a good

**Table 31. Lao Sun Chi's price list for knitting frames**

Name of machine	Specifications	Price per machine (in dollars)
Semi-automatic hose,	60 needles 10's woolen yarn	17
"	72 " 10's "	17
"	84 " 10's "	17
"	96 " 16's "	19
"	120 " 20's two ply cotton thread or 10's cotton yarn	19
"	140 " 20's two ply cotton thread or 10's cotton yarn	19
"	160 " 32's two ply cotton thread or 16's cotton yarn	20
"	180 " 42's two ply cotton thread or 20's cotton yarn	21
"	200 " 60's two ply cotton thread or 32's cotton yarn	23
"	220 " 60's two ply cotton thread or 32's cotton yarn	24
Automatic hose	120 " 20's two ply cotton thread or 10's cotton yarn	53
"	140 " 32's two ply cotton thread or 16's cotton yarn	53
"	160 " 42's two ply cotton thread or 20's cotton yarn	55
"	180 " 42's & 60's two ply cotton thread or 20's cotton yarn	58
"	200 " 60's two ply cotton thread or 32's cotton yarn	65
"	220 " 60's two ply cotton thread or 32's cotton yarn	65
Cap	120 " 9" x 9" 2" (Chinese measure) 4's woolen yarn	34
"	140 " 9" x 9" 2" (Chinese measure) 10's woolen yarn	37
Scarf	140 " 10½" (Chinese measure) 10's woolen yarn	42

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Name of machine	Specifications	Price per machine (in dollars)
Scarf	160 needles 10½" (Chinese measure) 10's woolen yarn	45
"	160 " 12" (Chinese measure) 10's woolen yarn	50
"	180 " 13" (Chinese measure) 10's woolen yarn	60
Vest	600 "	125
"	560 "	120
Sweater	400 "	155
Underwear (with cover)	800 "	180
" (without " )	800 "	140
Sewing machine	180 " operated by electric power	400

example. In connection with this table it may be noted that for automatic hose machines the small tube has a diameter of 3.2 tsun, fitted for making children's or women's hoses; the medium tube has a diameter of 3.4 tsun, fitted for making women's or men's hoses; and the large tube has a diameter of 3.5 or 3.6 tsun, fitted for making men's hoses. For semi-automatic hose machines the tube has a diameter varying from 3.2 to 4 tsun. Tsun is the Chinese unit of measure which is equivalent to 1.41 inches.

The knitting machines of Tientsin establishments, whether produced in Shanghai or in Tientsin, are sold not only to the clients in Tientsin, but also to those from other provinces, especially Manchuria, Shantung, Shansi, Honan etc. In selling machines to Tientsin clients the practice is for these establishments to dispatch own runners for orders, while clients from other provinces have to call upon these establishments for purchase. The transaction may be carried on in term of credit, or of cash, depending upon the credit standing of the client and the degree of his acquaintance with the establishment. Besides, any client who is a novice in knitting is priveleged to stay three days with the establishment, with free provision of room and board, in order to be taught the art of knitting by the foreman or skilled workman of the establishment.

Besides these eighteen knitting frame establishments there was another establishment exclusively engaged in the making of knitting needles, namely, Shih Chou, (日久). This establishment was organized in 1928, employing a capital of \$2,000 and a working force of 28 persons including 3 staff members and 25 apprentices. In 1929 it produced altogether 300,000 needles, at an average price of \$2.10 per hundred. The machinery employed was operated by electric power.

The process of knitting, which has been defined above, is preceded by winding, by which the yarn as it comes from the yarn merchant is wound on the bobbins by means of a native spinning wheel. After knitting,

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say of hoses, they must be cut and sewn, as each hose was knit with the other in an unbroken line of succession. The next process is to bleach the hoses in order to get rid of whatever dirt incurred in the course of knitting, and then to dye it with the desired color. After dyeing, the hoses are ironed, matched, and pasted with the trade label. The hoses are then ready to be packed into boxes of twelve pairs each, outside which is marked their size and color for ready differentiation.

### Raw materials and output

Cotton, wool and rayon yarn constitute the chief raw materials for the Tientsin knitting industry, in addition to which dyes are also used. In 1929 the 154 establishments in Tientsin consumed a total value of \$963,674 in raw materials, classified as follows:

**Table 32. Classification of raw materials consumed  
in Tientsin knitting industry, 1929**

Kind of raw materials	Quantity	Value	
		Amount (in \$)	Percent
Cotton yarn	71,629 small bales	517,068	53.7
Woolen yarn	188,300 pounds	386,746	40.1
Rayon yarn	14,340 „	27,857	2.9
Dyes		32,003	3.3
<b>Total</b>		<b>963,674</b>	<b>100.0</b>

The commonest arrangement in Tientsin knitting industry is to use cotton yarn alone, next to which is to use cotton and woolen yarn together. Of the 154 knitting establishments in Tientsin, 63 used cotton yarn only, 62 used cotton and woolen yarn, 14 used cotton, woolen and rayon yarn, 7 used cotton and rayon yarn, 6 used woolen yarn alone, 1 used rayon yarn alone, and 1 used woolen and rayon yarn. In other words, 146 establishments used cotton yarn partly or wholly, 83 establishments used woolen yarn partly or wholly, and 23 establishments used rayon yarn partly or wholly.

With the exception of cotton yarn, the other raw materials are imported from abroad, woolen yarn from England and Japan, rayon yarn from Italy, and dyes from Germany. Cotton yarns are partly produced in Tientsin mills, and partly imported from Japan, especially yarns of the higher counts. Their price varies with the count; the higher the count the higher the price. Generally speaking, cotton yarn of 10 counts sells at \$5.5 per small bale of ten pounds each, that of 20 counts at \$6.4, that of 32 counts at \$9.5, that of 42 counts at \$10, and that of 60 counts at \$16. Woolen yarns are distinguished by the brands, each of which varies in quality and price. Among the different brands on the market, including Loh Shih Lih (洛斯力), Tau Lih (門力), Scholar, Golden Star, Three Stars, Peacock, Honey, Paired Fish, Sparrow, etc. the first two are the

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best known, commanding a price of \$2.3 and \$2.2 per pound respectively. All these brands are imported in boxes of two hundred pounds each. Rayon yarns, which constitute the principal raw materials of the Jacquard weaving industry in Tientsin, is but a subsidiary material for hosiery knitting, sold at about \$1.50 per pound. Dyes, chiefly of the five standard colors or of the shades of these colors, are not invariably used by knitting establishments, as 34 of them delegated the process of dyeing to dyeworks. All these yarns and dyes have risen considerably in price recently, because of the depreciation of silver. This rise, it is feared, may inflict severely upon the development of the industry. These yarns and dyes are imported by the importers from whom they reach the knitting establishments through the medium of native firms, in small lots generally.

Hosiery, the output of knitting establishments, is commonly understood to mean stockings and socks, referring chiefly to the articles of footwear. Because of the extensive use to which knitted fabrics have been applied, the term hosiery has greatly outgrown its original significance as applied to footwear only, and now embraces underwear, articles used for intermediate garments and an increasing range of garments suited for outer wear. In the knitting industry in Tientsin, although stockings and socks, that is, hoses, form the major portion of hosiery output, yet other articles, including gloves, caps, scarfs, vests, pants, underwear and sweaters, are also produced. In 1929 the output of these different articles of hosiery is as follows: 454,186 dozens of hoses, of which 325,806 dozens are cotton, 114,640 dozens wool, and 13,740 dozens rayon; 17,780 dozens of gloves; 5,040 dozens of caps; 4,137 dozens of scarfs; 6,060 dozens of vests; 2,330 dozens of pants; 1,360 dozens of underwear and 4,885 dozens of sweaters.

That the use of hosiery articles should be so greatly extended from footwear to underwear as well as outer wear can only be explained by the characteristic merits that such articles possess. In the first place, hosiery articles, or knit fabrics, are elastic. They stretch and give because of the looped construction, which distinguishes them from woven materials. They fit without wrinkles which might press and hurt in underwear, or mar the appearance in outer wear. This elasticity, which distributes the strain as a garment is put on or taken off and during body movements, accounts also for the durability of knit fabrics. In the second place, knit fabrics are absorbent. The ability of knit materials to absorb moisture is due to the looped construction and to the use of loose spun yarn; the loose spinning also makes the fabric soft to the touch—comfortable. In the third place, knit fabrics are economical, as two factors tend to make a lower proportionate cost for knit materials than for woven fabrics, namely, the capacity of the knitting machine to use to advantage a more loosely spun yarn and a lower grade yarn than can be used in the loom, and the

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greater speed with which knitting can be executed than weaving. Finally, knit fabrics are adaptable. They can be made thick or thin, open or close in texture, plain or figured, rough or smooth.<sup>31</sup>

### Marketing method

The hosiery products of Tientsin establishments have a local as well as a national market; they are consumed in Tientsin as well as in other provinces—Manchuria in the Northeast, Shantung in the Southeast, Suiyuan, Shansi, Shensi, Kansu and Chinese Turkestan in the Northwest, and Honan in the South. In marketing Tientsin hosiery in these provinces or in Tientsin itself, the methods employed are not always the same. For other provinces the common practice is for the hosiery merchant to come to Tientsin and establish his temporary office in native hotels. If the merchant is a new acquaintance of the knitting establishment he may be introduced to it by a commercial middleman for the conclusion of any transaction. The middleman supplies the necessary information on market conditions to the merchant, and receives a commission of three percent for his service, which is oftentimes charged against the merchant in the form of higher prices. Such merchant, being a new client, has to pay in cash for his purchases. Indeed, as a means of gaining good standing with the establishment, he prefers to pay in cash for his first dealings. For later dealings, when he is given credit term by the establishment, such merchant, especially that from Manchuria, not infrequently runs away with the goods without payment. Besides this method of marketing, another one is for the establishment to organize a sales branch in other provinces, in order to deal with the merchants there directly, on wholesale basis. There are about 15 establishments in this class, of which five or six have branches in Peiping, Tsinan, Mukden, Changchun and Harbin. A third method, finally, is for the knitting establishment to open up a sales office in the city, to deal with the merchants from other provinces directly. Such establishments are of two classes, of which the larger ones, such as Yi Sun, Kuo Yu Heng, Yu Sun etc., usually have plenty of capital, and deal also in the hosiery articles of Shanghai make. For local marketing in Tientsin, there are also three methods employed. According to the first one, which is also the most popular, the miniature department stores buy the hosiery articles from knitting establishments, and deal them out in wholesale or in retail. These stores vary a great deal in the extent of business operation, as well as in the range of articles dealt in. The Committee has at random selected twelve of them for a sample investigation, of which two have a capital investment of \$5,000 each, one of \$4,000, three of \$2,000 each, one of \$1,000, two of \$800 each, two of \$500 each and one of \$300. These stores sell articles other than hosiery products—nominally all those imported from Canton or abroad, but actually including

31. Caplin, *op. cit.*, pp. 24.

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whatever wares required of daily life, whether imported or home produced. The quantity of hosiery products transacted by these stores, chiefly of hoses, varies from the highest of 38,476 dozens to the smallest of 77 dozens, running in order of relative importance as follows: 38,476, 11,280, 8,340, 3,200, 1,807, 1,649, 1,556, 1,398, 408, 400, 348 and 77—a total of 68,939 dozens. These stores, it must be noted, do not deal in Tientsin hosiery alone, but also in that of other knitting centres or of foreign countries. As the scale of their operation varies, so also the number of establishments with which they keep up business connections for the purchase of hosiery products: 1 with 10 establishments, 2 with 8, 1 with 7, 3 with 6, 2 with 5, 2 with 3 and 1 with 2. In dealing with the stores, the practice is for the knitting establishments to dispatch runners with sample of hosiery products. If the store makes a selection, an order is placed with the establishment for a certain quantity through the runner, but pays only for those that are actually sold, in term of credit usually. The account is settled during one of the three Chinese festivals or on the first or the fifteenth of the month. To three of these stores hosiery merchants from other provinces also resort for purchase, on wholesale basis. But their principal business is to cater to the needs of ultimate consumers, for retail sale. The second method of marketing, which is that of the sales office of Tientsin hosiery merchant, has already been touched upon in a previous paragraph. The third one, finally, is the hose bazaar, which can be found chiefly in busy corners of the city, in charge of small peddler working on own account or on that of the miniature department store or small knitting establishment. Although hoses, especially those of a low priced variety, constitute the principal articles for sale, other wares including tooth-brushes, tooth powder, soap, perfume, gloves, towels, rubber bands, toys, etc. can also be bought from these bazaars. The peddlers sell on commission basis when sent out by the miniature department store or small knitting establishment, but in working on own account, they may have to secure an initial capital of fifty to one hundred dollars, and let the rest be taken care of by short term credit granted by the miniature department stores or knitting establishments. These bazaars do not always have an unchanged location for business, but have to move from place to place in order to secure greater sales, or to make way for the traffic. In fact, some of them travel all over the town, visiting their clients in residential quarters. The price which they charge for their goods varies a great deal, for which the difference in their knowledge of demand conditions and shrewdness in striking at a bargain are chiefly responsible. An investigation of twenty-four of these peddlers by the Committee gives interesting facts with regard to their previous occupation and other details. Eleven peddlers, the largest number, were formerly workers; besides, there were eight traders, four coolies and one soldier. Among the eleven workers, there were six knitters, one weaver, two shoemakers, one mason and one



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smith. Among the traders there were four shopkeepers and four peddlers. Among the coolies there were one ricksha puller, one servant, and two drivers. The reasons for entering into the present occupation also vary: 15 were unemployed because of the suspension or contraction of the employers' business, the seasonal nature of their employment, and the disbandment of troops; 6 lost money in former occupation; 3 were sent out by their employers—the knitting establishments; and one, a ricksha puller, was too weak to keep up with his former occupation. That the occupation of peddling hoses is a temporary one can be judged by the short period of time in which the peddlers have entered into their present occupation. Twenty of them have entered into the occupation for half a year or less, two for one year or less, and two for one year and half or less. Their earnings, too, are rather small, averaging on the whole not more than fifteen dollars per month, from which have to be deducted the daily assessment of 3 cents each for street cleaning, and of 3 to 10 cents each for the space occupied.

### Taxation

The hosiery products of Tientsin are subject to three kinds of taxes, namely, export duty, coast trade duty, and various forms of likin under the names of native customs duty and parcel post duty. The export duty amounts to five percent *ad valorem*, but since the first of February of 1929 it has been raised to 7.5 percent by the assessment of a 2.5 percent export surtax. The coast trade duty, which is levied upon the product when the latter has already paid the export duty at the port of origin but is imported into another port, amounts to one half of the export duty, or 3.75 percent including the surtax. The product, however, has to pay, in addition to the export duty of 5% and the surtax of 2.5%, a native customs' duty or a parcel post duty, depending upon whether it is sent through the native customs or through the postal service. In either case, the tax amounts to about five percent *ad valorem*.

As the hosiery product is small in bulk, it is more frequently sent through the postal service. A parcel, however, must not exceed 16½ cattles in weight, or 22 pounds, before it can be accepted by the postal service for mailing. The merchants from other provinces, after having purchased their hosiery, generally have it sent to the destination through the postal service. To the latter the parcel post tax is paid, not by the merchant himself, but by the express company which also takes care of the packing for him. As the parcel post tax is assessed according to the value of hosiery purchased, the bill rendered by the knitting establishment stating the value is taken as the basis and turned over to the express company by the merchant. The merchant, as a means of evading a part of the tax, asks the knitting establishment to state a smaller value on the bill than that actually purchased. The express company, in turn, reports

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a smaller value than that stated in the bill, in filing out the application blank for parcel post. It is plain that the taxing authorities are not wholly ignorant of the abuse, but as they are often bribed by the express company, they remain reticent over such abuse. The express company has generally a capital of fifty to ten thousand dollars, as it transports not only hosiery but also other articles such as rayon and cotton fabrics. It is stated by one of the hosiery manufacturers that during the year 1929 one express company alone had to spend thousands of dollars in order to secure the favor of the authorities.

## Chapter IV. Workers and Apprentices

Among the leading handicraft industries in Tientsin, which include carpet weaving, rayon and cotton weaving, and hosiery knitting, the last is the smallest in respect of the amount of capital invested as well as of the number of workers employed. That this is the case can be seen from Table 33.

Table 33. Statistics on Capital and labor in Tientsin handicraft industries, 1929

Name of industry	No. establishments	Capital (in \$)	Workers
Carpet weaving	303	2,053,688	11,568
Rayon & cotton weaving	328	685,980	7,873
Hosiery knitting	154	180,140	1,610
Total	785	2,919,808	21,051

The number of workers in the hosiery knitting industry should be 2,745 instead of 1,610 if we include the crotchet knitters and sewers—1,135 in number. But the latter are not full-time, but part-time outworkers; they are better treated apart in a previous chapter on industrial organization. In 1929 the number of workers in the hosiery knitting industry showed an increase over that in the previous year, which amounted to 1,113<sup>32</sup> according to the investigation of the Social Affairs Bureau of the Special Municipality of Tientsin. This increase, as shown in Table 34, took place chiefly in the class of small establishments employing ten or fewer workers. Whereas the latter occupied only 46.66 percent of the total number of establishments in 1928, the percentage rose to 64.43 in 1929—an increase of 17.77 percent. As 1929 is an unfavorable rather than favorable year for the knitting industry, such increase is nominal rather than actual, nominal in the sense that the Bureau's investigation in 1928 was not as complete as it should have been. The Bureau, it may be recalled, reported only 4,841 workers<sup>33</sup> for the Tientsin carpet industry in 1928, whereas according to the investigation of this Committee in 1929 the number should actually be 11,568.

32. This total, which is obtained by the addition of workers for each of the 75 establishments, does not agree with the total given by the Bureau, namely, 1,231. The discrepancy arises chiefly from misprint of the figures for individual establishments. Cf. *Tientsin Industry and Commerce*, Social Affairs Bureau of the Special Municipality of Tientsin, 1930, pp. 87-92, 99. In a previous publication of the Bureau, *Annual Report* (Aug., 1928 to July, 1929), the total given is even larger, namely, 1,295.

33. Id, *Annual Report*.

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Table 34. Tientsin knitting establishments classified by the number of workers employed, 1928-1929

Workers per establishment	Establishments			
	1928		1929	
	No.	%	No.	%
1 - 5	16	21.33	41	27.52
6 - 10	19	25.33	55	36.91
11 - 15	14	18.67	27	18.12
16 - 20	14	18.67	12	8.06
21 - 25	4	5.33	6	4.03
26 - 30	1	1.33	3	2.01
31 - 35	3	4.00	2	1.34
36 - 40	2	2.67		
41 - 45			1	0.67
46 - 50				
Above 50	2	2.67	2	1.34
Total	75	100.00	149	100.00

The workers

Of the total working force in the Tientsin knitting industry, 451, or 28 percent, are workers, not apprentices. The Committee has not attempted to make a complete investigation of these workers. Instead, it has resorted to the process of sampling for an economical and practical analysis. Generally speaking, its criterion is to select one out of every five workers for actual field investigation; that is, 113 out of a total of 451 workers. These workers may be analyzed according to their place of birth, age, length of residence in Tientsin, marital status, size and composition of family. Of the 113 workers investigated by the Committee, only 7 are natives of Tientsin. Among the other 106, 104 are born in Hopei province, 1 in Shantung and 1 in Shansi. Of those born in Hopei (111), three fifths, or 63 workers, belong to 6 hsien, while the other two fifths, or 48 workers, belong to 27 hsien. In Table 35 the detailed distribution of workers according to the place of birth is given. In connection with

Table 35. Workers in Tientsin knitting industry classified by place of birth, 1929

Place of birth	No. workers	Place of birth	No. workers
Hopei	111	Tsing Hai	4
Nan Kung	16	Ch'ang	4
Wu Ch'ing	12	Ta Cheng	4
Pao Ti	11	Other 24	36
Chi	9	Shantung	1
Yu Tien	8	Shansi	1
Tientsin	7	Total	113

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this table it may be noted that those who are not natives of Tientsin, 106 in number, have resided in Tientsin for various years: 60 from one to five years; 42 from six to ten years; and four from eleven to fifteen years.

The age of 113 workers varies from the lowest of 15 to the highest of 44. 95, or 84 percent of the workers, falls within the age group of 19-27. 76, or 67 percent, falls within the age group of 20-25. With regard to marital status it may be noted that taking 20 as the marriable age for workers, only 34 out of 101 marriable workers, or 33 percent, have married, the rest 67 being single. Of those who are married, 15 have as yet no children, 5 have one child each, 10 have two children each, 1 has three children, and 3 have four children each. In Table 36 the detailed distribution of workers with regard to age and marital status is shown.

**Table 36. Workers in Tientsin knitting industry classified  
by age and marital status, 1929**

Age	Married	Single	Total	Age	Married	Single	Total
15		2	2	26	2	3	5
16				27	6	3	9
17		3	3	28	1		1
18		2	2	29	2		2
19	1	4	5	30			
20	3	8	11	31			
21	2	7	9	32	1		1
22	1	5	6	33			
23	2	15	17	34	2		2
24	4	12	16	35-44	5		5
25	3	14	17	Total	35	78	113

The size of the workers' families varies from the smallest of three persons to the largest of ten persons, the average being 5.8 persons. The size for 94 of them, or 83.2 percent, varies from four to seven persons. Here the word 'family' is employed in an economic sense, in the sense that the members of the same family live under one household economy. A classification of the members of these 113 families, 542 in number, shows that there are 1 grandfather, 1 grandmother, 84 fathers, 99 mothers, 5 uncles, 195 brothers, 78 sisters, 4 sisters-in-law, 35 wives, 22 sons and 18 daughters. In other words, most of the workers, about four fifths, have parents; while not more than one third have wives. Besides, a great number of them have brothers and sisters.

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**Table 37. Workers in Tientsin knitting industry classified by size of family, 1929**

No. persons per family	Families		No. persons
	No.	%	
3	6	5.3	18
4	14	12.4	56
5	26	23.0	130
6	35	31.0	210
7	19	16.8	133
8	10	8.8	80
9	2	1.8	18
10	1	0.9	10
<b>Total</b>	<b>113</b>	<b>100.0</b>	<b>655</b>

In 89% of the workers' families, namely, 100, other member or members of the family, besides the worker himself, are also gainfully employed. In 74 families there is one other member gainfully employed; in the remainder 26 families the distribution of other members gainfully employed runs as follows: 2 in 25 families and 3 in one family. Altogether there are 127 other members of the workers' families gainfully employed, including 84 fathers, 35 brothers, 5 wives and 3 mothers. Of these 127 members 88 are farmers, 11 traders, 18 workers, 5 coolies, 3 servants and 2 teachers. Their age distribution is as follows: 5 in 18-20 group, 28 in 21-30 group, 12 in 31-40 group, 51 in 41-50 group, 25 in 51-60 group, and 6 in 61-70 group.

**Terms of employment**

Among the terms of employment for workers may be mentioned the system of employment, system of wage payment, working hours and working conditions. The system of employment in Tientsin knitting industry is similar to that in other industries, under which an introduction from some one, related to the employer one way or the other, is often required. Thus, of the 113 workers investigated by the Committee, only 10 present themselves for job without any introduction, while the other 103 are introduced by various persons,—47 by fellow natives, 23 by friends, 23 by relatives, 7 by co-apprentices and 3 by neighbors. These persons who introduce the applicants to the employers are themselves engaged in various occupations, chiefly in knitting (64), but also in other branches of industry (5), agriculture (4), trade (21) and free professions (5). Four of them only are unemployed. The applicants, meantime, are also employed in various occupations before their admission into knitting establishments, of which knitting claims the largest number, namely, 60. Of the remaining 53, 12 are employed in industry, 19 in agriculture and 1 in trade. 21 applicants, including 12 students, are not gainfully employed.

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With regard to the length of service, 59 out of 113 workers, or 52 percent, have been with the employer for three years or less: 17 for half a year, 4 for 1 year, 23 for 2 years, and 15 for 3 years. The length of service for the other 54 workers is as follows: 13 for 4 years, 16 for 5 years, 8 for 6 years, 4 for 7 years, 6 for 8 years, 2 for 9 years, 1 for 10 years and 4 for more than 10 years. Of these 113 workers 29 have lost employment for 51 times during the last five years. The reason for unemployment includes close-down of employers' business for 31 times, reduction of employers' working force for 10 times, dispute with co-workers for six times, and workers' sickness for 4 times. During these 51 times of unemployment 6,834 days were lost, or an average of 134 days per time of unemployment. The 29 workers, in other words, lost an average of 236 days because of unemployment during the last five years.

The system of wage payment in the knitting industry is based on time, piece, or both. Most of the workers are paid by piece, especially the knitters, while others such as winders, dyers and foremen are paid on time basis. A modified piece rate system, however, is not uncommon, under which a worker is paid a certain rate per month, but is required to perform a certain quantity of work per day, above or below which he is given a premium or deduction from his monthly rate. Thus, in one of the establishments, Paoshan, a work list is issued to the following effect, for workers and apprentices respectively. The apprentices commonly receive no wages, but for the excess amount of work done he is paid a premium like the workers.

**Table 38. Work list of Paoshan Knitting Establishment, 1929**

Needle	Machine	Kind of hose	No. dozens required		Wage rate per dozen knit above requirement
			to be knit		
			Worker	Apprentice	
180	Automatic	Man's hose, cotton	5 1/2	4 1/2	6 cents
180	Semi-Auto.	" " "	5	4	10. "
140	"	Children's hose, high, cotton	3 1/2	3	12 "
96	"	Men's hose, cotton	6 1/2	5 1/2	5 "
96	"	" " woolen	5	4 1/2	6 "
96	"	" " high, woolen	4 1/2	4	10 "
72	"	" " woolen	5 1/2	4 1/2	6 "
72	"	" " high, woolen	4 1/2	4	12 "
72	"	Women's hose, woolen	4 1/2	4	8 "

The wages for the 113 workers in knitting industry in Tientsin are shown in Table 39, in which board, which is freely provided to all except seven workers (i.e. winders) receiving a wage rate of ten dollars or less, is included by raising the wage rate to the extent of their cost, which is estimated at \$6.00 per worker. According to this table

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Table 39. Monthly wages for workers in Tientsin knitting industry, 1929 (in dollars)

Wages per month	Including board		Excluding board	
	No. workers	Total wages	No. workers	Total wages
2			1	2
3			5	15
4			10	40
5			17	85
6			36	216
7			19	133
8			6	48
9	1	9	3	27
10	10	100	7	70
11	15	165	2	22
12	20	240	1	12
13	25	325	1	13
14	11	154	1	14
15	4	60	2	30
16	11	176	1	16
17	2	34		
18	1	18		
19	8	57	1	19
20	8	60		
Total	106	1,398	113	762

the commonest wage per month including board runs from ten to sixteen dollars, applicable to 96 out of 106 workers, or ninety percent. The average wage is 13.1 dollars per month, which is also the mode, applicable to 25 workers.

The hours of work in the knitting industry are unusually long. 71.8 percent of the establishments, employing 68.7 percent of the workers, have eleven to thirteen hours of work per day. Only 4.7 percent of the establishments, employing 7.6 percent of the workers, have the shortest working hours of nine per day; while 0.6 percent of the establishments, employing 0.3 percent of the workers, have the longest working hours of 15 per day. The detailed distribution of working hours in Tientsin knitting industry is shown in Table 40.



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**Table 40. Hours of work in Tientsin knitting industry, 1929**

Hours per day	Establishments		Workers	
	No.	%	No.	%
9.0	7	4.7	122	7.6
9.5	2	1.3	59	3.7
10.0	12	8.1	126	7.8
10.5	2	1.3	33	2.1
11.0	19	12.8	248	15.4
11.5	7	4.7	51	3.1
12.0	44	29.5	460	28.6
12.5	10	6.7	87	5.4
13.0	27	18.1	261	16.2
13.5	4	2.7	25	1.6
14.0	14	9.5	132	8.2
14.5				
15.0	1	0.6	6	0.3
Total	149	100.0	1,610	100.0

The holidays for the workers in hosiery knitting are the same as those for other handicraft industries. For the New Year the holiday is the longest, lasting from three, ten or fifteen days, but the commonest is ten days. For the Moon and Dragon festivals, there is a holiday of one to three days, but one day is the commonest. These three festivals are the traditional holidays, but on other occasions such as the Double Tenth (i.e. National Independence Day), the Labor Day and any other day sanctioned by the authorities, there is generally one day's holiday. On the first or fifteenth of the month under lunar calendar there is either a cessation of night work or of day work for half a day, so as to give the workers an opportunity for bathing, hair cutting or running other personal errands. Meantime, the employer makes use of this spare time to clean his machinery or to settle his accounts with clients. Some employer, such as Kuo Yu Heng (郭有恒), gives a month's rest to the workers during the year, but similar instances are seldom found.

That the working conditions in Tientsin knitting industry are on the whole unfavorable had been foretold in a previous chapter on industrial organization. To quote from that chapter, the knitting establishments "are mostly small and crowded, with little outlet for ventilation. Most of the small establishments occupy only two rooms, which accommodate somewhere from five to ten persons. These rooms serve not only as workshop but also as business office, storehouse, kitchen, dining hall and bedroom. In one of the many small establishments visited by the present writer, the wife of the owner, manager, foreman and worker was sitting

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on an elevated ground, by the side of which were two and three apprentices, standing, knitting hoses or winding bundles of yarns into spools. This room, about eight feet square, was filled with repulsive odor, and covered with muddy floor. A small window and a side door, which were closed most of the time because of winter cold, served as the only outlet for ventilation. The elevated ground, by the way, was the bed for the manager and his wife. The other workers, chiefly apprentices, slept in the next room of the same size, which was also a workroom. By the side of the bed was the kitchen, composed of a small brick oven and a pan above it. In the middle of the room finished hoses and wound yarns were piled on a hanging board—a miniature storehouse for the establishment. Outside these two workrooms, there was a small courtyard filled with dyed hoses exposed to the sunlight and air for drying. This picture of a small establishment is not exaggerated, but typical of many other establishments operating on a similar scale."

That the workers in the knitting industry are employed under highly unfavorable terms can be easily seen from the above review of their wages, hours of work and working conditions. They are further to be pitied for their lack of organization,—their inability to form a knitters' union. Because of this inability, there is practically no channel for the expression of their grievances.

**The apprentices**

Among the leading handicraft industries in Tientsin, namely, carpet weaving, rayon and cotton weaving, and hosiery knitting, the last, being the smallest, employs the highest percentage of apprentice labor. In the following table it may be seen that whereas the first employs 28% and the second employs 65%, the last employs as high as 72%.

**Table. 41. Apprentice labor in Tientsin handicraft industries, 1929**

Name of industry	Apprentices		Workers		Total
	No.	%	No.	%	
Carpet weaving	3,262	28	8,306	72	11,568
Rayon & Cotton weaving	5,117	65	2,756	35	7,873
Hosiery knitting	1,159	72	451	28	1,610
Total	9,538	45	11,513	55	21,051

As is the case with the workers the Committee has made a sample survey of 220 out of 1,159 apprentices in the knitting industry. Of these only 4 were born in Tientsin, 200 in other hsien of Hopei, 13 in Shantung, 2 in Shansi and 1 in Anhwei. Of those born in Hopei (204), about one half (99) came from five hsien, and the other half from 43 hsien. Of those born in Shantung (13) 6 came from Teh Hsien and 7 from other seven hsien. In the following table the detailed distribution of apprentices according to place of birth is given.

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**Table 42. Apprentices in Tientsin knitting industry  
classified by place of birth, 1929**

Place of birth	No. workers	Place of birth	No. workers
Hopei	204	Ho Chien	5
Nan Kung	33	Shaw Kwang	5
Chi	27	Tientsin	4
Wu Ch'ing	17	Other 36	68
Yu Tien	15	Shantung	13
Nan P'i	7	Teh	6
Wu Yih	6	Other 7	7
Ch'ang	6	Shansi	2
Tsao Chiang	6	Anhwei	1
Tsing Hai	5	Total	220

A comparison of the above table with Table 35 shows that the apprentices came from about the same districts as the workers. Two thirds of the workers and apprentices, 227 out of 333, came from fourteen hsien—all in the province of Hopei. Each of these fourteen hsien contributed seven or more persons: 49 from Nan Kung, 36 from Chi, 29 from Wu Ch'ing, 23 from Yu Tien, 14 from Pao Ti, 11 from Tientsin, 10 from Nan P'i and Ch'ang respectively, 9 from Tsing Hai, 8 from Ho Chien, 7 from Wu Yih, Tsao Chiang, Ta cheng, and Shaw Kwang respectively. In

**Table 43. Workers and apprentices in Tientsin knitting  
industry classified by place of birth, 1929**

Place of birth	Apprentices	Workers	Total
Hopei	204	111	315
Nan Kung	33	16	49
Chi	27	9	36
Wu Ch'ing	17	12	29
Yu Tien	15	8	23
Pao Ti	3	11	14
Tientsin	4	7	11
Nan P'i	7	3	10
Ch'ang	6	4	10
Tsing Hai	5	4	9
Ho Chien	5	3	8
Wu Yih	6	1	7
Tsao Chiang	6	1	7
Ta Cheng	3	4	7
Shaw Kwang	5	2	7
Other	62	26	88
Shantung	13	1	14
Shansi	2	1	3
Anhwei	1		1
Total	220	113	333

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Table 43 the detailed distribution of the workers and apprentices according to place of birth is given. From an examination of this table it may be concluded that Tientsin natives constitute but 3.3 percent of the total workers in knitting industry, the other 96.7 percent being supplied by other hsien in Hopei and other provinces, especially Shantung. As most of the workers and apprentices come from farmers' families, this city-ward movement of rural labor constitutes one of the notable features in the course of China's industrialization. It is for the same reason that the employers have to provide both room and board to the workers, under what is known as the 'dormitory system' which also prevails in Japanese industries.

Before the apprentices entered into the knitting industry, a little more than one half, or 120, were school boys. Of the other half (45.5%), 29 (13.2%) were assistants in farming, and 8 (3.7%) apprentices in knitting etc. 63, or 28.6%, were idle, being neither schooled nor employed. Most of these apprentices, 190 (86%), fall within the age group of 14-18: 26 apprentices are 14 years of age; 32, 15; 68, 16; 36, 17; 28, 18. The age distribution for the other 30 apprentices is as follows: 5, 13 years of age; 10, 19 years of age; 9, 20 years of age; 6, above 20 years of age.

The size of apprentices' families varies from the smallest of two persons to the largest of twelve persons, the average being 5.9 persons. The size for 178 of them, 80%, varies from four to seven persons. A classification of the members of these 220 families shows that there are 5 grandfathers, 9 grandmothers, 175 fathers, 191 mothers, 41 uncles, 14 aunts, 371 brothers, 265 sisters and 9 sisters-in-law. 159 apprentices have both parents, 16 have fathers only, 32 have mothers only, while 13 have neither parent, being orphans.

**Table 44. Apprentices in Tientsin knitting industry  
classified by size of family, 1929**

No. persons per family	Families		No. persons
	No.	%	
2	3	1.4	6
3	10	4.5	30
4	25	11.4	100
5	62	28.2	310
6	50	22.7	300
7	41	18.7	287
8	13	5.9	104
9	5	2.3	45
10	6	2.7	60
11	2	.9	22
12	3	1.4	36
<b>Total</b>	<b>220</b>	<b>100.%</b>	<b>1,300</b>

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In ninety-five percent of the apprentices' families, namely, 208, other member or members of the family, besides the apprentice himself, are also gainfully employed. In 160 families there is one other member gainfully employed; in the remainder 50 families the distribution of other members gainfully employed runs as follows: 2 in 34 families, and 3 in 14 families. Altogether there are 270 other members of the families gainfully employed, including 2 grandfathers, 171 fathers, 1 mother, 20 uncles, 75 brothers, and 1 sister. Of these 270 members 182 are farmers, 58 traders, 19 workers and 11 teachers, soldiers and servants. Their age distribution is as follows: 16 in 16-20 group, 56 in 21-30 group, 81 in 31-40 group, 99 in 41-50 group, 15 in 51-60 group, and 3 in 61-70 group.

### **Terms of apprenticeship**

The terms of apprenticeship in the knitting industry are on the whole similar to those in other handicraft industries in Tientsin, especially rayon and cotton weaving and carpet weaving. But because of the lack of any employers' organization in the industry, such terms are not stereotyped in the form of written regulations. According to the regulations of one knitting establishment, Hua Ming, which are rather typical of many others, any applicant for apprenticeship must be introduced by some body, and guaranteed by another one for the faithful fulfillment of apprenticeship. He is given a trial period of two weeks, during which period he may be dismissed by his master for failure to meet the requirements. The term of apprenticeship lasts for three years, during which period the apprentice is given an opportunity to learn the craft of knitting, and is obliged to stay with his master until the completion of his term. The living expenses of the apprentice, including room, board, medical and miscellaneous items, are paid for by the master, provided that the apprentice complete his term of apprenticeship; otherwise, the guarantor is held responsible for refunding the master with the cost for board, at \$6.00 per month. This provision also applies to an apprentice who is dismissed because of disobedience. The apprentice, furthermore, must be 15 to 20 years of age, he must be in good health and be able to read and write a little bit. He must not ask for leave of absence except in case of marriage or death in his family or of his own sickness, which period of absence must be made up before completing the term of apprenticeship.

Such, then, are the terms of apprenticeship. In practice, there are always deviations from these terms. The persons who recommend the apprentices to the employers may be fellow natives, friends, relatives, etc. Of the 220 apprentices investigated by the Committee, 91 are recommended by fellow natives, 78 by relatives, 24 by friends, 22 by family members and 5 by neighbors. These persons who recommend the apprentices are mostly engaged in knitting themselves, totalling 100. Of

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the other 120, 77 are engaged in trade, 20 in industry, 8 in agriculture and 7 in other fields. Besides, 8 of them are unemployed.

The term of apprenticeship is generally three years. Of the 220 apprentices investigated, 180 are subject to three years, 13 to three years and four months, and 27 to three years and half. At the time of the Committee's investigation, the 220 apprentices have already completed a part or all of their term of apprenticeship: 25 apprentices have been with their masters for 1/2 year or less, 81 from more than 1/2 year to 1 year, 39 from more than 1 year to 1 1/2 years, 47 from more than 1 1/2 years to 2 years, 19 from more than 2 years to 2 1/2 years, and 9 from more than 2 1/2 years to 3 years.

Generally speaking, the apprentice learns the process of winding first, and knitting later. The time during which the apprentice is taught to knit varies a good deal with the character of the working force and the aptitude of the apprentice himself. In small establishments where there is no winder but the apprentice, he may be required to perform the process of winding during a large part of his apprenticeship, with occasional instructions in knitting. But in larger ones the conditions are a little better off for the apprentices. He is not only given an early chance to knit, but is given a daily premium for production above requirement, in addition to a small monthly wage. In one of the establishments. Ta Hsin Ch'ang (大信昌), the apprentice is given one dollar per month for knitting four dozens of hoses per day, two dollars per month for knitting five dozens per day, and three dollars per month for knitting six dozens per day, with a premium of one cent for knitting every pair above the requirement. The total wage is paid during the nearest one of the three festivals, but in case of family need or of proper personal expenditure, the apprentice may ask for the wage at any time. In other establishments such as San Chih (三吉), the wages of the apprentice are paid at the end of each month.

The apprentice labor, which occupies almost seventy-two percent of the total working force in the knitting industry, is now giving signs towards a decline. When the apprentice labor was first employed in the industry fifteen or twenty years ago, there was a scarcity of adult knitters commanding a wage as high as thirty to forty dollars per month. Besides, these knitters were quite recalcitrant in spirit and excessive in demand against their employers. They frequently left one employer for another because of the great demand for them. The employers, realizing the strategic position that the workers then occupied, had to look elsewhere for means of defense, and finally resorted to the employment of apprentice labor. This was due to two reasons. In the first place, the apprentice demanded no wages, and secondly, he could not very well leave his master before the completion of the term of apprenticeship. Apprentice labor,

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in other words, is less costly and more steady. At present, however, after the industry has gone through a development of about twenty years, the situation is reversed. The workers have increased in supply, as more and more apprentices joined their rank every year. Consequently, they are receiving much lower wages than before, averaging only 13.1 dollars per month including board. On the other hand, the industry, being no longer a new one, cannot reap excessive profit for its product, but is confronted with the problem of price-cutting competition among small manufacturers. It is in a rather fluctuating state now that both war and famine have shut up the markets for its output. To some of the manufacturers it seems more profitable to employ workers rather than apprentices. The workers, not being protected by any organized union, may be hired or fired at the employer's will, and assume more and more a casual character, while according to the term of apprenticeship, an apprentice must be kept for at least three years. Furthermore, the workers require no training, and can do better work than the apprentices.

## **Chapter V. Prospect and retrospect**

### **A summary of the industry**

The knitting industry, which developed first in Canton, Shanghai, Hankow and other ports of China, did not spread to Tientsin until 1912, in which year an English company by the name of Chih Tso introduced the knitting frame at an exorbitant price. In a few years Chinese workers were trained up in the industry, and learned to produce not only native hosiery, but also native knitting frame. Wang Chi-chung, the pioneer of the industry, organized the first knitting establishment in 1913 and the first knitting frame establishment in 1914, and gave the industry an opportune start. Other establishments soon followed suit, and the industry went through a period of rapid development especially during the Great War, with imported goods shut off from the market. In 1929, the industry had so developed as to claim 154 establishments, employing 1,610 workers.

The knitting industry in Tientsin, however, was chiefly organized on a small scale, under the master craftsman and merchant employer systems. The organization, furthermore, was highly flexible, for a workman could easily set up as a small master or as a middleman for the large establishments, the merchant employers. The small scale on which the industry is operated can be shown in many respects. Of the 154 establishments in the industry, five employed no worker, while the other 149 had altogether 1,610 workers, or an average of 11 workers per establishment. The commonest size, however, is that of 6-10 workers, applicable to 55 establishments. The amount of capital invested, too, is insignificant, the total for the industry being \$180,140. Of this total \$106,000, or 59 percent, was contributed by 14 establishments, the other 136 employing only \$74,140, or an average of \$560 per establishment. In respect of the number of knitting frames 154 establishments employed a total of 1,265, or an average of eight frames per establishment. The commonest size, however, is that of 1-5 frames, applicable to 78 establishments. With this small amount of labor, capital and knitting frame at disposal, the amount of raw materials consumed as well as that of the hosiery produced could not be very large. The 154 establishments, accordingly, consumed only \$968,674 worth of raw materials and produced \$1,813,650 worth of hosiery articles. The latter sum, it may be recalled, is ten times that of the capital invested for the whole industry.

The knitting industry, which is the smallest among the textile industries in Tientsin, possesses also the unique feature in the employment of middlemen and outworkers in the two branches, namely, the sewing branch of the frame knitting industry and the hand or crochet knitting branch. In these two branches the number of middlemen employed may be estimated at 150 and that of outworkers employed at 1,135, of whom



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569 were sewers and 566 crochet knitters. The Committee has made a sample survey of 23 middlemen and 200 outworkers, for the sake of practical and economical analysis. This survey shows that under this system, the middleman, the connecting link between the knitting establishment and the outworkers, receives the hoses from the former and distributes them among the outworkers for sewing. The wage that the middleman receives from the establishment is generally higher than that paid to the outworker, the difference constituting the earnings of the middleman for his services. Thus, according to the Committee's investigation, of the total wages paid by the establishment to the middlemen in 1929, \$2,551, or thirty-two percent, are deducted by the middlemen as earnings. The middlemen, however, are not fully employed in distributing hoses, which constitutes only a by-employment and returns an average earning of but \$111 per year. Accordingly, ten of the twenty-three middlemen are also engaged in other occupations including hosiery knitting, brokerage, peddling, farming and carpentry. Similarly, the outworkers do not take sewing or crochet knitting as their principal occupation. Most of them, being unmarried young girls, are engaged in it at spare times, in order to make some pin money. To them the employment is an unexpected gain, and assumes a casual character. To a small number who are members of poor families, however, the occupation of sewing or crochet knitting brings supplementary income to the family, in order to eke out a living under hard circumstances. In 1929 the total earnings from sewing for the 200 outworkers reached \$13,780, or an average of \$68.9 per outworker. This average, however, must not be taken seriously, as many factors entered into the size of an outworkers' earnings, of which the degree of casualty in his employment is perhaps the most important.

Knitting, the art of forming a single thread or strand of yarn into a texture or fabric of a loop structure, by employing needles or wires, is divided into two branches, namely, hand knitting and frame-work knitting. Hand knitting is essentially a domestic art, which is carried on in Tientsin by the outworking crochet knitters referred to above. The latter receive the work from the miniature department stores or hat shops, through the medium of middlemen, and execute it at spare times as a by-employment to household duties. The frame-work knitting branch, or machine hosiery knitting, is carried on in the knitting establishments, whose scale of operation has been described in the second chapter. In this branch of knitting, the most important instrument is the knitting frame, first invented by Rev. William Lee as far back as 1589, about three centuries and half ago. His frame, which was a flat one, could knit only a flat fabric, for circular machine was not invented and perfected until 1845. Since then, both types of machines have been in use, operated either by hand or by power. In Tientsin, knitting by hand frame still prevails to the fullest extent. The knitting machine used, which was at

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first imported from Japan, and later on from Shanghai, could now be produced in Tientsin also, by knitting frame establishments. According to the Committee's investigation there were in 1929 eighteen knitting frame establishments, some of which were both producing and selling agents of knitting frames while others were selling agents only. Five of these sold knitting needles as well, which were imported from abroad, chiefly Japan. These eighteen establishments had a total capital of \$19,300, with a working force of 181 persons. In 1929 they sold altogether 2,722 knitting frames, 2,758,000 needles, 145 sewing machines and 100 spinning wheels, with a total value of \$142,487. Besides these 18 establishments there was another one engaged exclusively in the production and sale of knitting needles. In 1929 it produced and sold a total of 300,000 needles, at a value of \$6,300.

In respect of the raw materials used, the most popular is the cotton yarn, next to which is the woolen yarn. Rayon yarn, the chief raw material employed in the Jacquard weaving industry in Tientsin, is the least used. Thus, in 1929 the knitting industry in Tientsin consumed a total value of \$963,674 in raw materials, including \$517,068 for cotton yarn, \$386,746 for woolen yarn, and \$27,857 for rayon yarn. The other \$32,008 are spent for dyes, as 120 establishments have dyeing of hoses performed on own premise. In respect of the hosiery articles produced, the largest quantity goes to the socks and stocking—a total of 454,186 dozens, of which 325,806 dozens are cotton, 114,640 dozens wool, and 13,740 dozens rayon. Other articles include the following: 17,780 dozens of gloves, 5,040 dozens of caps, 4,137 dozens of scarfs, 6,060 dozens of vests, 2,330 dozens of pants, 1,360 dozens of underwears and 4,885 dozens of sweaters. These articles are sold at a total value of \$1,813,650, while their cost amounts only to \$1,374,465. The net profit, therefore, reaches 24.2% for the industry as a whole.

In marketing the hosiery products, the methods vary according to the extent of market covered. For provincial marketing, the practice is either for the merchants from other provinces to come to Tientsin and purchase the hosiery products from the knitting establishments, directly or indirectly through the commercial middleman, or for the knitting establishments to have a sales office or agent in these provinces in order to deal with the merchants on the very spot of consumption. A third method, applicable also to local marketing, is for the knitting establishment to organize a sales office in the city, and deal directly with the local retailers or provincial merchants. In local marketing, however, two other methods are employed, namely, sale through the miniature department stores or sale through the hose bazaars of small peddlers, in addition to marketing by the sales office of the knitting establishment.

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In respect of the workers employed, the apprentice labor occupies the majority, namely, 72 percent. Indeed, among the leading handicraft industries in Tientsin, including carpet weaving, rayon and cotton weaving, and hosiery knitting, the last employs the highest percentage of apprentice labor. The Committee, in investigating the labor conditions in the knitting industry, has resorted to the process of sampling for an economical and practical analysis. Under this process, the Committee has investigated altogether 113 workers and 220 apprentices, out of 451 workers and 1,159 apprentices in the industry. Both workers and apprentices are natives of Hopei or Shantung, there being very few Tientsin natives. The fact that most of them come from farmers' families give the further confirmation that the process of urbanizing the rural labor is also at work in this industry, and to a large extent. The age of the workers varies from the highest of 44 to the lowest of 15; 95, or 84 percent, fall within the age group of 19-27. The age of the apprentices varies from the highest of 25 to the lowest of 13; 190, or 86 percent, fall within the age group of 14-18. Most of the workers are unmarried, and like the apprentices, come from families of about six persons each. Before admission into the establishment of the employers, both workers and apprentices have to be introduced by persons related to the employer one way or the other—whether fellow natives, friends, relatives, co-apprentices or neighbors. After admission the terms of employment or of apprenticeship do not promise a bright future for both sets of labor. For the workers the length of service is not definitely agreed upon, but according to the traditional practice in Chinese industries, a worker may be fired at any one of the three festivals. His wages are on the whole low, averaging only \$13.1 per month including board; his hours of work are long, the commonest being twelve hours per day. The workshops, meantime, are crowded and stuffy, highly unfavorable to the health of the workers and apprentices alike. For the apprentices the payment of wage is rather uncommon, but is occasionally resorted to as a means of promoting efficiency or of prolonging the term of apprenticeship; while the hours of work are the same as those for the workers. If there be any advantage in favor of the apprentice, or disadvantage, it lies chiefly in the fixed minimum period of employment which may be three years or three years and four months.

### Causes for decline

The knitting industry in Tientsin, which had its first development in 1912, went through a period of rapid growth since 1917. At present, however, the industry has come to another crisis, on the verge of a downright decline. This phenomenon of decline, which is common to other handicraft industries including carpet weaving and rayon and cotton weaving, should not have affected the knitting industry, as the latter supplies one of the daily necessities in great demand. But it has come

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to stay, and must be carefully analyzed with a view to making suggestions for a revival. We may, for the sake of facilitating the discussion, classify the causes responsible for such decline into two groups, namely, external and internal, and then proceed to analyze each group of causes in greater detail. The external causes for the decline are beyond the control of the industry, which must rely chiefly upon an improvement in the economic or political conditions in China or abroad, while the internal ones the industry, if needed, may easily remove by a thorough-going reform. Among the former the most important is perhaps the recurrence of war and famine. The latter not only interrupts the means of communication, and thereby closes up the channel for consumption; it also prevents the peaceful pursuit of gainful occupations and thereby reduces the purchasing power of the consumers. The chief markets of Tientsin hosiery, such as Manchuria, Shansi, Shensi, Kansu, Honan, etc., are converted into battlefields or deserted lands at one time or the other, with little prospect for a return to normal conditions in the immediate future. Consequently, the industry has no outlet for its output, and must either slow down its operation or suspend it entirely. A second cause, which is partly a result of the first, is the increased burden of taxation. It is plain that warfare is a direct drain upon the resources of the nation, either in the form of inflation or of taxation. In China resort has been made to both, of which taxation bears more directly upon the knitting industry than inflation. Thus, there are taxes upon the hosiery products on the one hand, and those upon the knitting establishments on the other. The hosiery products have to pay an export tax of 5% *ad valorem*, plus an export surtax of 2.5%. Besides, it has to pay a native customs duty or a parcel post tax if sent to the interior through the native customs or the postal service, or a coast trade duty of 2.5%, plus a coast trade surtax of 1.25%, if sent to another port. On the other hand, the taxes on the knitting establishment are not fixed, but rather irregular. The knitting establishment, like any other business establishment, has to purchase the government bonds issued chiefly for the purpose of financing internal warfare. Furthermore, under the military regime of Ch'u Yu Pu and Chang Chung Ch'ang, in 1926, it had to pay a business license tax in proportion to the amount of capital invested. As no one of the knitting establishments dared to report the true amount of its capital, the authorities made it worse by setting an arbitrary figure for the purpose of levying the business license tax. Consequently, a very small establishment, with two or three hundred dollars capital, had to pay a tax of ten to twenty dollars. Again, during the anti-Japanese boycott in 1928, the knitting industry, which had to purchase Japanese yarn as raw material, was forced to pay a sale tax for Japanese goods, the chief object of which was to permit the sale of the Japanese goods already on stock, despite the anti-Japanese boycott. The third cause, which is also common to other

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handicraft industries using raw materials imported from abroad, is the increase in the price of raw materials for the knitting industry, including cotton yarn, woolen yarn, rayon yarn and dyes. This increase, which is a direct outcome of silver depreciation recently, inflicts a serious loss upon the industry. Although a part of the cotton yarn, especially of lower counts, can be purchased from native manufacturers, the rest, including cotton yarn or thread of finer counts such as 42's and 60's, woolen yarn, rayon yarn and dyes, must be purchased from gold using countries. These three causes, namely, war and famine, taxation, and the increase in the price of raw materials, are external. The internal causes, relating chiefly to the lack of capital, deficiency in technique and poor marketing method, may be summarized under the general heading of organization. That the industry lacks the necessary capital for a more economical scale of operation has been emphatically stated in a previous chapter on industrial organization. Its deficiency in technique needs no further collaboration when one compares the knitting industry in Tientsin with that in Shanghai. In Tientsin, unlike in Shanghai, no electric power is as yet employed. The process of mercerizing, too, is not performed on the premise, but delegated to native dyeworks without modern facilities. Sewing, which is performed by machinery, is executed by outworkers of poor families. The small manufacturers in Tientsin, again, have little insight into the taste of consumers, and do not select the desirable colors for dyeing. Finally, the method of marketing in Tientsin is to be severely criticized. Price-cutting, a practice commonly found in Tientsin industries, is a greater evil in hosiery knitting, where the number of small manufacturers is larger than that in other industries. These manufacturers, having little capital at their disposal, have to live from hand to mouth. Unlike the larger ones, their credit standing is generally low, and no merchant, whether of raw materials or of provisions, dares to trust them with a term of credit longer than a few days. Sometimes cash is actually demanded for every transaction. As a result, these manufacturers have to sell today's output tomorrow, irrespective of the market conditions. Furthermore, because of their urgent need for capital, their bargaining power is reduced to the minimum. Under these conditions, what do they care about the economic laws of demand and supply or of trade moral? In other words, they have to cut price in order to exist; they are no longer able to compete in the sense that the term competition is employed by the orthodox economist. Meantime, the miniature department stores, to which they sell their output, are all too aware of their distress, and take advantage of it. At times when the knitting establishments are operated on a little large scale, and are in a position to assign goods to these stores for sale on credit terms, the latter will purposely delay the payment for goods actually sold, and will not push the sale until

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a favorable price is granted. These stores, it may be noted, have connections with several knitting establishments at one time, and possess greater bargaining power. It is through them that the factor of foreign and native competition can be set at work, to a more or less intensive degree. The foreign hosiery is generally of the expensive grade, and as a rule is not dealt in by these stores. The native hosiery, especially of Shanghai make, is however a serious competitor to Tientsin hosiery. That the former is a better output, in respect of workmanship as well as of taste, has already been sketched in a previous paragraph. Furthermore, Shanghai establishments are operated on a much larger scale, with a greater amount of capital. Their tax burden is also smaller than that of Tientsin establishments. These establishments, having a very small amount of capital, are not qualified to register their output with the Ministry of Industry, Commerce and Labor, and thus cannot secure the privilege of having to pay only one tax, namely the export tax. It is for these reasons that although the customs returns give the import of hosiery for 1929 at a total value of Hk. Tls. 32,856, the latter must have been a larger sum actually. The customs total, it may be noted, includes only hosiery articles imported by way of the sea, not of the land. It is quite possible that hosiery articles, being light and valuable, can be more quickly imported by means of railway.

### Suggestions for revival

In view of the rapid decline of the knitting industry, some steps must be taken towards its revival. In the above paragraph, we have already examined the causes for its decline in some detail. It is plain that such causes are not superficial, but deep-rooted, and a removal of them requires both time and effort, not only on the part of the industry itself, but also on that of the nation at large. A cessation of warfare, and a return to peace and order, is the first requirement for revival. If that is accomplished, taxes can also be reduced when the need for financing warfare is gone. The people can settle down to pursue their respective occupations, and improve upon their present economic distress. Their purchasing power may thus be enhanced, and with the means of communication again restored, and if possible, with the likin walls also abolished, the knitting industry, like many others, will have a virgin field for its output. Meantime, the problem of raw materials can also be solved, partly if not wholly. Under a peaceful regime, not only will the old industries prosper, but new ones can also be started, to spin the cotton and woolen yarns, if not the rayon yarns, at home. Finally, the knitting industry itself may be re-organized, on a much larger scale than before. The small manufacturers, whose presence has added instability rather than stability to the industry, must be removed, in such a way as to make their existence impossible. The employment of apprentice labor,

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which is the mainstay of small masters, must be more strictly regulated by the government, whether national or local. Its terms should be so specified that on the one hand the apprentices might receive an adequate training in the craft, and that on the other the cost of adult labor should at least be made equivalent to that of apprentice labor. The small master, in other words, must not be left uncontrolled in his exploitation of apprentice labor. Again, the large manufacturers in the knitting industry should be organized into some sort of an association, like those in other industries, whether carpet weaving, or rayon and cotton weaving. Such organization, besides fixing if necessary the price for the output, should have the chief object of co-operative control over the industry in regard to the quality of output, as well as of the conditions of work. The last two requirements, it may be remembered, are essential to the revival of the industry in a world of keen trade competition. With better conditions of work and stricter selection of the working force, the workmanship of the output is improved, and a better article, commanding a higher price, is produced. Such organization, furthermore, should have a department for information and research, to advise and to inform its members on the source of raw materials, methods of marketing, improvements of technique, etc., for the knitting industry is a quite complicated one, requiring a knowledge of current development in technical, chemical, artistic and economic lines. Since in the immediate future a part of the raw materials such as cotton and woolen yarn have to be imported from gold using countries, the manufacturer should also be aware of the exchange situation. He should, above all, have sufficient capital to pay for the fixed and running costs; he should not have just enough to spend for fixed capital, resorting to loans for circulating capital. With the constant and expert advice of the organization, he should, in the end, be able to run his business on a scientific basis, and bring new hopes to the already declining industry.

## **Publications of the Nankai University Committee on Social and Economic Research**

In order to meet the growing demand for the collection and analysis of social and economic facts in China in recent years, the Nankai University appointed a Committee on Social and Economic Research in the fall of 1927. The results of the Committee's investigation have hitherto appeared in the two weekly publications of the Committee, namely, "The Nankai Weekly Statistical Service" (English and Chinese), and "Economic Weekly" (Chinese), as well as in the leading economic and business journals in China. Arrangements, however, have been made by the Committee to issue special publications since 1929, some of which have already appeared in printed form in the following series:—

### **I. Price series:—**

Wholesale prices and price index numbers in North China, 1913-1928, by Franklin L. Ho, 145pp. 4°

Index numbers of the quantities and prices of imports and exports and of the barter terms of trade in China, 1867-1928, by Franklin L. Ho, 24pp. 4°

### **II. Industry series:—**

Extent and effects of industrialization in China, by Franklin L. Ho and H. D. Fong, 34pp. 4° (out of print)

Tientsin carpet industry, by H. D. Fong, 77pp. 4°

Rayon and cotton weaving in Tientsin, by H. D. Fong, 79pp. 4°

Hosiery knitting in Tientsin, by H. D. Fong, 76pp. 4°

### **III. Economic history series:—**

Triumph of factory system in England, by H. D. Fong, 310pp. 4°

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