

mines in Kirin and Fengtien Provinces was recognized.

In recent years, these mining rights of Japan were greatly restricted by the then Mukden Government, which in 1927 prohibited mining companies operating with foreign capital, according to instructions issued by the Department of Industry of the Peking Government; and again in 1928 the Industrial Department ordinance of Kirin Province levied an additional special tax on mines operated under Sino-Japanese joint capital. In 1929 Fengtien Province issued an ordinance prohibiting joint Sino-Japanese mining of the third class minerals (non-metallic minerals other than coal), and did not sanction applications for Sino-Japanese joint mining enterprises. In 1930 the Mukden Government attempted to prevent, systematically and uniformly, the entrance of foreign capital into the Manchurian mining industry, by applying the new mining regulations of the Nanking Government.

Such infringements of the acquired rights of Japan by these ordinances and laws accumulated to become an important part of the so-called pending problems of Manchuria and Mongolia, and constituted an important underlying cause of the ensuing Sino-Japanese conflict.

But with the establishment of the new State of Manchoukuo, conditions have radically changed, as all former pending problems have been solved, and thus new prospects of future development of the mining industry are assured of realization. The new mining policy and enterprises of Manchoukuo will be later explained in detail. Also the production quantities of the various minerals are given at the end of the present chapter.

### Metallic Minerals

**Iron.**—Iron and coal are the two most important mineral products of Manchoukuo. The iron deposits are estimated at more than 1,220 million metric tons, and are located chiefly at Anshan (鞍山) in Fengtien Province, Kungchangling (弓張嶺) and Miaoerhkou (廟兒溝). Iron is found also on the north-eastern bank of the Yalu River, along the Mukden-Antung Railway line, and in the Kwantung Leased Territory. The ore is mostly hematite and magnetite, but generally of poor quality, containing less than 40 percent of iron, and the average annual production in the recent five years has been 882,000 tons. As there is an abundant supply of coal and other necessary materials, Manchoukuo should become one of the industrial regions of East Asia.

During the prosperity of the years 1918 and 1919, numerous small iron works were established throughout Manchuria, but with the economic depression which followed, these small works have disappeared, and today there remain only the two iron works at Anshan and Penhsihu.

*Showa Steel Works* (formerly Anshan Iron Works).—The largest iron deposit in Manchoukuo is at Anshan, in Fengtien Province. It lies within a semicircle with a radius of 15 kilometres with the Anshan Works of the Showa Steel Works as the centre and consists of quartz schist, magnetite ore and hematite ore. The total deposit is said to be about 458 million metric tons, but as the ore is mostly poor, with a content of only about 35 percent of iron, it was believed that its economic utilization would be limited, but with the discovery of a new method of concentrating the ore, the deposit suddenly, in 1925, came to possess a high economic value.

The history of the Anshan Iron Works is comparatively short. By the terms of the Sino-Japanese Treaty of May, 1915, the Japanese were allowed to take up mining activities in South Manchuria, and the Anshan Tiekwang Chenhsing Wuhsien Kungssu (鞍山鐵礦振興無限公司), or Anshan Iron Deposit Developing Company was established in March, 1916, at present under Japanese-Manchurian joint management. Its purpose was to mine ore at Anshan, and supply it to the Anshan Iron Works established by the South Manchuria Railway Company.

The South Manchuria Railway Company erected the Anshan Iron Works on the basis of a plan for the production of one million metric tons of pig-iron a year, and as a first step, the construction of two furnaces with a daily production of 200 metric tons each, was begun in May, 1917. On April 29, 1919, the first furnace was fired, and the first pig-iron was produced on May 1. In the first six years of operation of the Works, the total investment in construction amounted to ¥40,000,000.

The present equipment of the Anshan Works of the Showa Steel Works includes three furnaces, coke ovens, water-works, by-product plants and power plants. The original plan of producing one million metric tons of pig-iron a year did not, however, materialize, and up to the winter of 1925 only one furnace was operated, producing annually from 70,000 to 90,000 metric tons. This unsatisfactory result was due directly to the post-war panic, but fundamentally to the fact that the problem of concentrating the poor ore had not yet been solved. As previously stated, the district around Anshan contains large deposits of ore, generally of poor quality, containing only from 35 to 40% of iron, and so the production was small compared with the large amount of fuel required, rendering

the cost of production extremely high. Therefore, at first, only the comparatively rich ore containing an average of some 50-60% of iron was mined, but as the quantity of such ore is limited, it became evident that though even only one furnace was operated, the supply would not last long.

The Iron Works therefore tried to solve this problem and after many experiments finally discovered more advanced processes of hematite reducing and magnetic concentration. Thus confidence was gained to produce economically rich ore containing 55% of iron. The concentration plant capable of supplying the concentrated ore necessary for the already operated two furnaces was constructed in the two years, 1924 and 1925.

As the result of the operation of the new concentration plant, the pig-iron production annually increased as shown in the following table. To materialize a new pig-iron production of 280,000 metric tons, another American type furnace of 500 metric tons capacity was constructed in 1928, in addition to the two furnaces already in operation.

The equipment at the Anshan Iron Works at the end of 1931 was as follows :

Furnace—Two 300 ton furnaces ; one 500 ton furnace.

Hot Air Furnace—One.

Pig-iron casting—Maximum capacity 175 tons per hour at each furnace.

Reduction Roasting Furnace—10 Anshan type, capacity 300 tons each daily.

Fusing Plant—6 fusing machines, annual capacity 480,000 tons.

The pig-iron production at the Anshan Iron Works since its establishment has been as follows :

Table 1

## PIG IRON PRODUCTION AT ANSHAN

	Number of Castings	Annual Pig-Iron Production (Metric tons)	Average Daily Production (Metric tons)
1919 .....	1,958	32,128	95.6
1920 .....	2,909	76,482	209.5
1925 .....	2,831	89,676	245.7
1926 .....	4,727	165,054	452.2
1927 .....	5,634	203,445	555.9
1928 .....	5,612	224,461	615.0
1929 .....	5,322	210,443	577.0
1930 .....	4,209	288,433	790.2
1931 .....	4,513	269,494	736.3

Varieties of pig-iron produced at the Anshan Iron Works and their standard analyses are as follow :

Quality	Carbon	Silicon	Manganese	Phosphorus under	Sulphur under	Copper
No. 1 Special	3.20—4.00	3.50—4.00	0.15—0.20	0.12	0.01	0
No. 1	3.20—4.00	2.50—3.50	0.15—0.20	"	0.02	0
No. 2	2.80—3.50	2.00—3.00	0.15—0.20	"	0.04	0
No. 3	2.80—3.50	2.00—3.00	0.15—0.20	"	0.08	0
Bessemer	2.80—3.50	2.00—2.50	0.15—0.20	"	0.02	0
Flat Furnace	2.80—3.50	under 2.00	0.15—0.20	"	0.05	0

Equipment for coke production has a capacity of 930 metric tons per day, and by-products are produced in the following quantities annually :

Table 2

## BY-PRODUCTS AT ANSHAN IRON WORKS

	Production Capacity (Metric Tons)	Production (Metric Tons)			
		1928	1929	1930	1931
Sulphuric Acid .....	7,600	5,345	5,466	7,529	7,150
Sulphate of Ammonium .....	6,000	3,903	4,016	5,692	5,441
Refined Naphthaline .....	600	404	400	332	430
Benzol .....	3,500	1,946	2,263	2,619	2,560
Tar Distillation .....	14,000				

The Anshan Iron Works became independent of the South Manchuria Railway Company and was attached to the Showa Steel Works in 1933. The project for producing pig-iron and steel under one management in Manchuria was already considered when the Anshan Iron Works was established in 1916, but it was suspended due to the world economic disturbances. The Showa Steel Works was established in 1929, but because of the condition in Manchuria at that time and also the domestic political situation in Japan, no actual work was commenced. In 1931 the situation in Manchuria suddenly changed, and as a result of the establishment of Manchoukuo, the Showa Steel Works commenced activities, partly for the purpose of strengthening the basic iron and steel industry of Japan. Thus the Showa Steel Works took over the entire enterprise of the Anshan Iron Works from the South Manchuria Railway Company. The Showa Steel Works has a capital of ¥100,000,000, and plans to carry out its programme of producing annually 200,000 metric tons of steel and 133,000 tons of steel materials, a total of 333,000 tons, based upon the present capacity of the Anshan Works to produce 400,000 tons of pig-iron a year. This plan is expected to materialize in 1935, and when it is, not only will the demand of Manchurian markets be supplied but also steel will be exported to Japan, China and the East Indies.

The Showa Steel Works also purchased the iron mines at Kungchangling (弓張嶺). The Kungchangling Iron Mining Company was established in 1918 as a joint enterprise of Japanese and the then Mukden Government, but the company did not actually undertake any work. With the establishment of Manchoukuo, the rights formerly held by the Chang régime in the company went to the Manchoukuo Government. The Showa Steel Works purchased the Japanese rights in the company, and thus the Kungchangling Mining Company became a new joint Japanese-Manchurian enterprise. The company has started mining to supply iron ore to the Showa Steel Works. The iron deposit at Kungchangling is estimated at about 380,000,000 metric tons.

*Penhsihu Iron Works*—Ore for this works comes from the Miaoerhokou (廟兒溝) iron mine, in Fengtien Province, which has an estimated deposit of 230 million metric tons. The works are under the management of the Penhsihu Colliery and Iron Works (本溪湖煤鐵公司), at present a joint Japanese-Manchurian corporation. Started in October, 1911, the works were enlarged several times, and at present the capacity for the production of pig-iron is 120,000 metric tons annually, but owing to the recent inactivity of the market, the production is restricted and only about 70,000 metric tons are produced. The pig-iron production of the works since 1921 has been as follows:

Table 3

## PIG-IRON PRODUCTION AT PENHSIHU

(Metric Tons)

1921 .....	31,017
1922 .....	(production suspended)
1923 .....	24,388
1924 .....	51,950
1925 .....	50,000
1926 .....	51,000
1927 .....	50,500
1928 .....	63,030
1929 .....	76,300
1930 .....	85,060
1931 .....	65,620

The coal-field in possession of the Penhsihu Colliery and Iron Works produces the best coal for coke used in manufacturing special pig-iron, namely pig-iron with slight phosphorus content which is indispensable as munition material.

The standard analyses of the pig-iron produced at the Penhsihu Iron Works are as follow:

Quality	Carbon under	Silicon over	Manganese over	Phosphorus under	Sulphur under	Copper
Low Sulphur .....	3.00	1.00	0.50	0.25	0.015	Trace
No. 1 Special.....	"	3.00	0.25	0.07	0.01	"
No. 1 .....	"	2.50	"	"	0.03	"
No. 2 .....	"	2.00	"	"	0.05	"
No. 3 .....	"	1.50	"	"	0.08	"
Specially Made	Manganese 0.80-1.00: percentage of other ingredients, the same as in ordinary pig-iron.					

*Export of Iron*—The iron production in Manchoukuo is almost entirely consumed by the iron works in that country, and the amount of exported iron ore is very small. Pig-iron produced in Manchoukuo is exported in the largest quantity to Japan and also to China.

Table 4

## EXPORT OF PIG OR MANUFACTURED IRON, CLASSIFIED BY DESTINATION

(in Metric Tons)

	Japan	China and Chinese ports	Others	Total	Values H.K. Taels
1929 .....	204,759	24,145	605	229,509	7,179,264
1930 .....	182,626	39,540	756	222,922	8,223,275
1931 .....	248,741	38,779	2,176	289,696	10,138,911

*Gold*.—Both gold ore and placer gold are produced in Manchoukuo. Placer gold is found mainly in Heilungkiang Province and the northern parts of Kirin Province; the districts of the Moho (漠河) and Humacrho (呼瑪爾河) Rivers and upper streams of the Amur River are the principal placer gold mining districts; placer mining has developed also in the Sungari River region and in the upper stream of the Luho (撻河) River in the Nonni River valley. Gold mines are located in various parts, but none is operated at present. Fengtien Province and the southern part of Kirin Province are gold producing districts; the noted mines are Tamiaokou (大廟溝) and Wufenglou (五鳳樓), near Tunghwa, on the upper stream of the Yalu River, Hsianglowantzu (香爐碗子) south-east of Peishanchengtzu (北山城子) and Chaihopu (柴河堡), east of Tichling station on the South Manchuria Railway. But in these places gold has already been recklessly mined and they are now in the declining stage.

Jehol Province possesses many gold deposits, and also produces placer gold. Therefore, gold is regarded as one of the two important mineral products of the province, the other being coal. Details about the gold deposits in Jehol are not yet clearly known, but the main deposits are found

in Chienping-hsien (建平縣), Chihfeng-hsien (赤峰縣), Fuhsin-hsien (阜新縣), and Chaoyang-hsien (朝陽縣). Also gold is produced in Fengning-hsien (豐寧縣) and the northern part of Chengte (承德).

The gold deposits in the northern parts of Manchoukuo are estimated at 3,779 metric tons according to Dr. Ahnelt, and the annual production value is said to have amounted to about ¥15,000,000 at one time.\* Lately it is believed that gold mining in Manchoukuo requires equipment on a large scale. The gold producing districts are mostly situated in parts where peace and order are not maintained properly, and they are yet to be investigated.

The gold mining industry in the northern districts is mainly government enterprises, and only a few mines are entrusted to private operation.

In Kirin Province there are gold mining districts at Lingchuan (稜川) near Ilan (依蘭) on the lower stream of the Sungari River, and at Yenho (延和), Chientao (間島). The Lingchuan Mining Company has an estimated output of 375 kilogrammes, the largest quantity shown among all the gold mining enterprises in the northern districts.

In Heilungkiang Province, famous gold producing areas are the Moho gold mine (漠河金廠) near the northwestern frontier of the country, the gold mine in the Humaerho (呼瑪爾河) River district southwest of Huma (呼瑪), the Fengyuan (逢源) mine in the Taheiho (大黑河) and Fapielaho (法別拉河) River district in Aigun-hsien (琿瑯縣), the district of Taipingkou (太平溝), Kwanyinshan (觀音山) and Tuluho (都魯河) River in the northwestern parts of Lapei-hsien (羅比縣), the Menluho (門龍河) River district along the upper stream of the Nonni (嫩江) River, and the gold mines of the Wutungho (梧桐河) and Hochinoh (赫金河) River district in the lower stream region of the Sungari River in Tangyuan-hsien (湯原縣).

Because of the insufficient facilities for peace maintenance and the remoteness of these mines from transportation lines, and also due to their small scale and the primitiveness of their operation methods, the total estimated production of gold in 1931 was only 1,121 kilogrammes.

The new Government of Manchoukuo is giving special attention to development of the gold mining industry as will be explained later, and a large surveying party was sent to the gold producing regions along the Sungari River. Thus it will not be long before the conditions in these gold producing districts will be clearly known.

\* E. E. Ahnelt, *Mineral Resources of North Manchuria*, 1929.

**Copper.**—Not a few districts in Manchoukuo are known as copper producing territories, but mostly they have not sufficient deposits to enable the operation of a copper refining industry. Only small scale copper refining plants are established at Tienpaoshan (天寶山) in the Chientao district, Panshih (盤石) in Kirin Province, Tungkungling (銅鑛嶺) along the Antung-Mukden Railway, Malukou (馬鹿溝) in Penhsihu-hsien, and Panling (盤嶺).

The Tienpaoshan copper mine operated under Sino-Japanese joint management was very active during the world war, operating a blast furnace, but as the copper price fell considerably with the close of the war, it was obliged to suspend operations.

The Panshih copper mine also was started by the Kirin Yunheng Provincial Bank temporarily during the world war, but was obliged to close down when the post-war depression set in.

At present Panling (盤嶺) is the only mine being worked. It is located northeast of Tsaohokou (草河口) Station. The copper percentage is said to be 14%, and the estimated deposit is 27,000 metric tons.

**Lead.**—Lead appears, in veins or in mass, in more than ten districts in Manchoukuo, but the deposits are generally irregular with frequent intermittence, and there are only very few capable of exploitation on a large scale. The Chingchengtzu (青城子) lead mine, in Fengtien Province, has been worked on quite a large scale, and the deposit is believed to be of good quality. In 1924 the mine produced 2,600 metric tons of lead ore, and 950 metric tons of crude lead was refined at the mine. It was prosperous at that time, but the economic depression caused the suspension of production, and at present the mine is only prospecting.

Other lead mines are at Erhpengtientzu (二棚甸子), and Sungshuang (松樹卯) in Fengtien Province; Kuanmachutzu (官馬咀子) in Kirin Province; Puliehiehho (布列野河) in Heilungkiang Province; and Hsiaoheikou (小黑溝) and Yentungshan (煙筒山) in Jehol Province. The mines in Jehol have mostly produced silver.

**Sulphuric Iron.**—Sulphuric iron ore is found quite often but the deposits are generally small. At Linchiatai (林家臺) near Tungyuanpu (通遼堡) on the Mukden-Antung Railway line, and Yangmukou (楊木溝) near Tsaohokou (草河口), there are sulphuric iron mines which are still being worked. The yield of these mines is supplied to the Sulphuric Acid Plant of the Fushun Colliery.

At the Penhsihu, Niuhsintai (牛心臺) and Yentai (煙臺) coal-fields,

sulphuric iron ore is found in the coal seams, and is mined together with the coal.

**Manganese.**—Manganese is found at Heisunglin (黑松林) and at Hsiaohuangchi (小黃旗), where the deposit is of good quality but small, and is now being mined.

### Non-Metallic Minerals

**Coal.**—Coal is the foremost mineral product of Manchoukuo, having the largest production of all, and the total deposit is estimated at 4,804 million metric tons. The strata containing coal are limited to three eras. The oldest is the Permian carboniferous series, appearing together with shale and sandstone, to which the Penhsihu, Fuchou, Yentai and Niuhsintai mines belong, the grades ranging from superior bituminous to superior anthracite. The second belongs to the Jurassic period of the Mesozoic Era, appearing with tuff and sandstone, and the coal is bituminous or super-bituminous. The deposits are found at Hsian (西安), Muling (穆陵), Hsinchiu (新邱), and Peipiao (北票). The third belongs to the Oligocene period of the Tertiary Era, existing among shale and sandstone, and the varieties are bituminous or lignite. Fushun and Chalainor (札賚諾爾) belong to this category.

Coal deposits are distributed throughout Manchoukuo, but the coal-fields at Fushun, Penhsihu and Hsian in Fengtien Province, Chalainor in Heilungkiang Province, and Hsinchiu in Jehol Province are famed as the largest in Manchoukuo.

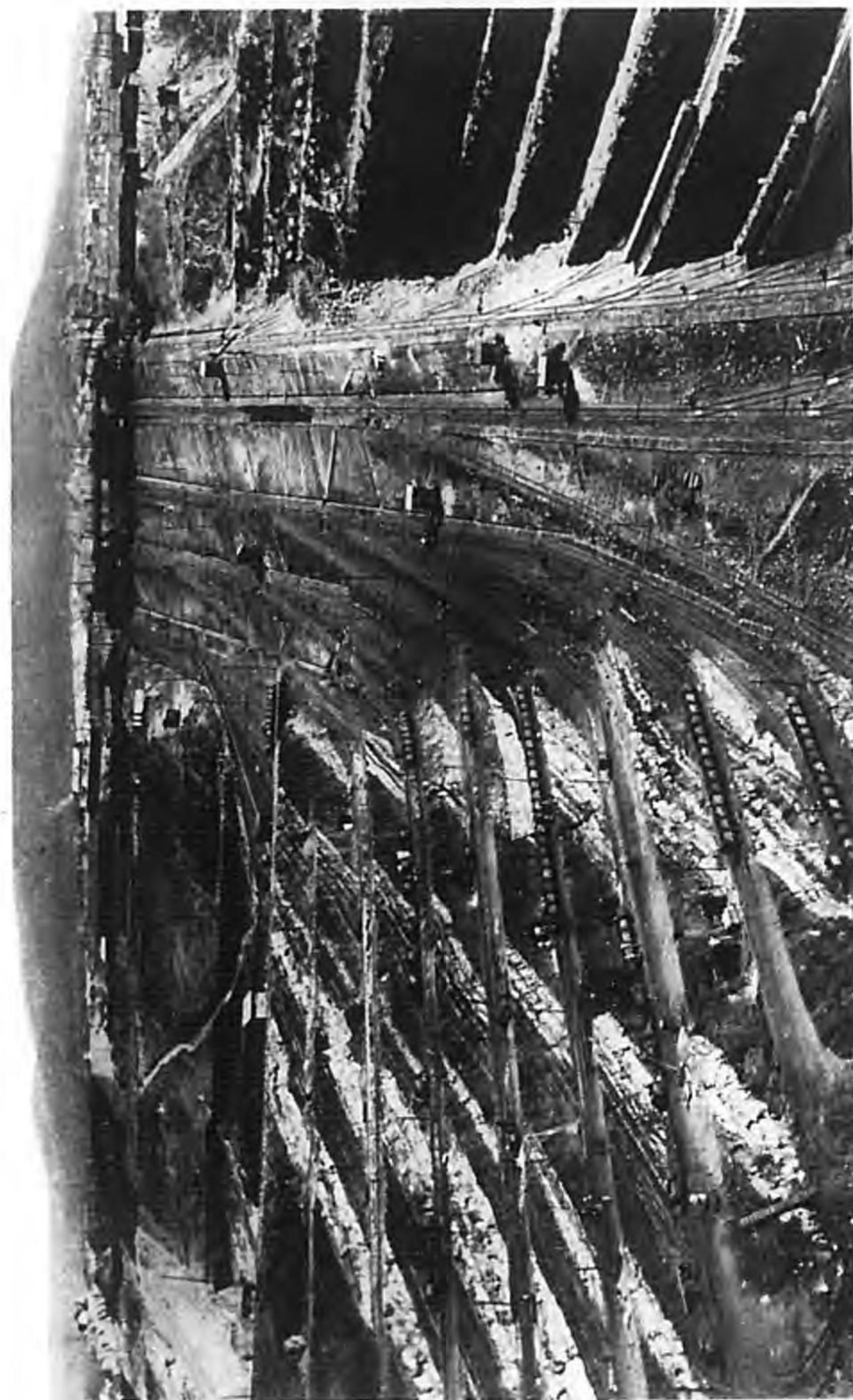
The coal deposits in Manchoukuo are estimated as follows:

Table 5

#### COAL DEPOSITS IN MANCHOUKUO

(Metric Tons)

Fengtien Province .....	1,668,000,000	Heilungkiang Province...	555,000,000
Fushun Coal-field.....	950,000,000	Chalainor .....	300,000,000
Yentai Coal-field .....	40,000,000	Haolikang.....	144,000,000
Penhsihu Coal-field ...	220,000,000	Others .....	111,000,000
Takota (or Sian) .....	110,000,000	Jehol Province .....	1,551,000,000
Pataokuo .....	200,000,000	Hsinchiu Coal-field ...	1,100,000,000
Others .....	147,000,000	Nuantitang .....	12,000,000
Kirin Province .....	1,030,000,000	Peipiao .....	250,000,000
Mishan .....	214,000,000	Others .....	189,000,000
Laotouerhkuo .....	16,000,000	Total for Manchoukuo	4,804,000,000
Muling .....	75,000,000		
Others .....	725,000,000		



Open Cut at Fushun Colliery.

*Fushun Coal-field.*—The Fushun (撫順) coal-field is 32 kilometres east of Mukden. The average thickness of the coal seam is 40 metres, reaching 130 metres in the thickest seam, and the estimated deposit of coal is said to be more than 950 million metric tons. The coal is bituminous and weakly adhesive; its characteristics are a large content of volatile matter, a small quantity of ash, generally a large amount of nitrogen, and a non-adhesive nature. The coal found in the eastern part of the Fushun field is comparatively adhesive and is used for making coke. The Fushun coal is for steaming, gas producing, manufacturing, porcelain kilns, cooking and domestic purposes.

The right of mining the Fushun coal was acquired first by a Russian forestry company, but was transferred to Japan as a result of the Russo-Japanese War. Since 1907, the mining has been under the management of the South Manchuria Railway Company. When the mine was transferred to Japanese management, the daily coal output was only 360 metric tons, but after several extensions the daily output has now reached 22,000 metric tons. The annual production is, at present, between 6,000,000 and 7,000,000 metric tons. When the general depression is over, therefore, it is not improbable that the yearly output will reach 10 million metric tons.

The coal production at Fushun in the past six years has been as follows:—

Table 6  
ANNUAL COAL PRODUCTION AT FUSHUN  
(Metric Tons)

1926 .....	6,227,065	1929 .....	7,254,582
1927 .....	7,707,455	1930 .....	7,172,911
1928 .....	6,969,845	1931 .....	6,354,660

The Fushun coal-field includes some mines which do not belong to the South Manchuria Railway Company, but at present only a small one of them, called Achinlou (阿金溝), is continuing operations. The annual production of this mine was 87,000 metric tons in 1930 and 46,800 in 1931.

An important feature of the Fushun coal-field is the open-cut or surface mining which yields nearly one half of the coal production there. The surface covering thus removed to reach the coal seams consists of oil shale containing oil, and the South Manchuria Railway Company, after years of study, has discovered an economical method of obtaining oil from this shale which is fully described in the following pages.

*Yentai Coal-field.*—The Yentai (煙臺) coal-field lies 14 kilometres east of Yentai Station on the South Manchuria Railway main line, and is connected with it by a branch line. The field belongs to the Permian carboniferous period, and the estimated deposit is reported to be more than 40 million metric tons. At present, of the numerous coal seams, only three are being mined, and in 1931 the coal production was about 176,800 metric tons. Mining is under the management of the South Manchuria Railway Company.

The coal production at Yentai in the past six years has been as follows:

Table 7

## COAL PRODUCTION AT YENTAI

(Metric Tons)

1926 .....	139,500	1929 .....	135,800
1927 .....	141,000	1930 .....	178,200
1928 .....	154,900	1931 .....	176,800

In the Yentai coal-field there are two mines besides that of the South Manchuria Railway Co., namely Weimingshan (尾明山) and Panshengpu (攀盛堡). The production of the former mine was 54,660 and 11,136 metric tons in 1930 and 1931 respectively. The latter mine showed production of 35,590 and 4,963 metric tons respectively in 1930 and 1931.

*Penhsihu Coal-field.*—The Penhsihu (本溪湖) coal-field lies on the Mukden-Antung Railway line, in Fengtien Province. There are eight main seams with a total thickness of about 13 metres, the estimated deposit being more than 200 million metric tons. The coal quality is highly bituminous, and strongly adhesive, thus being most suitable for making coke. The coal-field is mined under the management of the Penhsihu Colliery and Iron Works, a joint Japanese-Manchurian company.

The Penhsihu coal-field is one of the largest in Manchoukuo, and the production there in the past six years has been as follows:

Table 8

## COAL PRODUCTION AT PENHSIHU

(Metric Tons)

1926 .....	415,000	1929 .....	521,000
1927 .....	398,000	1930 .....	582,000
1928 .....	490,000	1931 .....	469,700

*Takota and Fuchou Coal Mines.*—The coal mines at Takota (大柞) (or Hsian 西安) in Fengtien Province, and Fuchou (復州) (or Wuhutsui 五

湖嘴) on the border of the Kwantung Leased Territory were, up to the recent Manchurian incident, operated directly by the Mukden Government, being two great coal mines under the management of the North-Eastern Mining Bureau. The Takota coal deposits are estimated at 111 million metric tons, and those at Fuchou at 13,900,000 metric tons. The annual production at Takota was 80,000 metric tons, and at Fuchou 222,000 metric tons in 1931. The North-Eastern Mining Bureau also operated the Pataokou (八道溝) coal mines on the Ta-tung railway line, Fouhsin (阜新) coal mine in Liaohsi (遼西), and also steatite and gold mines.

With the establishment of Manchoukuo, these mines have come to be operated by the new State.

*Chalainor Coal Mine.*—The Chalainor (札賚諾爾) coal mine is situated on the western line of the North Manchuria Railway and has been owned by the railway since 1902. Its operation was formerly in various hands, but since 1924, it has again been under the direct operation of the railway. In 1929 when the Soviet-Chinese controversy broke out, operation was suspended, but again it came to be operated on a small scale by the open-cut method. The production reached the highest mark in 1928, namely, 254,000 metric tons, but it dropped to 186,000 metric tons in 1929, and to 5,800 tons in 1930. It increased to 20,373 tons in 1931.

*Muling Coal Mine.*—The Muling (穆陵) coal mine acquired note when a Russian merchant named Skidelsky formed the Muling Coal Mining Company in 1923, jointly with the Kirin Provincial authorities. It is reported that the then Chinese Eastern Railway aided in the construction of the coal-carrying railway by advancing ¥1,200,000 as coal purchase payment. The coal-carrying railway was completed in 1925, and mining was started.

The total deposit is said to be about 75 million metric tons. The coal is bituminous, strong in cohesive power, and its long-burning characteristic is its feature. According to one observation, it is said that the importance of this coal will be greatly enhanced when the Mishan (密山) coal mine, situated about 64 kilometres further in the interior, is exploited. The coal production was 281,000 tons in 1928, 350,000 tons in 1929, 322,600 tons in 1930, and 300,000 tons in 1931.

*Haolikang Coal Mine.*—This mine is situated 75 kilometres north of Chiamussu (佳木斯) on the Sungari River, in Heilungkiang Province. The Haolikang (鶴立崗) coal mine has been operated since 1919 as a joint undertaking of the Kirin and Heilungkiang Provincial governments, and

Chinese merchants. Its coal production rapidly increased after a coal supply contract was signed with the Chinese Eastern Railway in 1924. The production was 100,000 metric tons in 1928, 120,000 metric tons in 1929, 170,000 metric tons in 1930, and 300,500 metric tons in 1931.

*Laotouerhkou Coal Mine.*—With the opening of the Hsinking-Tumen railway line, the Laotouerhkou (老頭兒溝) coal mine in Chientao on the line, has become important. It was formerly started to be mined in 1918 as a joint enterprise of the Kirin Provincial authorities and Japanese. With the formation of the new Government, it became a joint enterprise of the Manchoukuo Government and Japanese, and operations have been resumed with new vigour. The capital of the enterprise is ¥200,000, and the coal deposit is estimated at 2,000,000 metric tons. The quality is fairly good, though somewhat inferior to coal mined at Fushun and Hsian.

*Hsinchiu Coal-fields.*—The Hsinchiu (新邱) coal-field at Fouhsin (阜新) in Jehol Province is said to be quite similar to the Fushun coal-field, and the deposit is extremely large. The total deposit, including other mines in the neighbourhood operated by Chinese capital, is reported to be 1,100 million metric tons. The Hsinchiu coal-field has been operated since 1914 by the Tahsing Kungssu (大興公司) and the Tahsin Kungssu (大新公司), now both joint Manchurian-Japanese corporations.

The production is yet small, 4,216 metric tons in 1928, 10,775 metric tons in 1929, 9,984 metric tons in 1930, and 10,000 metric tons in 1931, but it has good prospects of future development. The coal produced at two other mines situated in the immediate vicinity of the Hsinchiu field is estimated at 29,000 tons in 1928, 23,000 tons in 1929, and 20,000 tons each in 1930 and 1931.

Comparing the coal production in the various provinces of Manchoukuo, it is seen that Fengtien Province, which has the Fushun and Penhsihu mines, is foremost, followed by Kirin, Jehol, and Heilungkiang Provinces in the order mentioned. In view of the great deposits of coal in Jehol Province in comparison with those of other provinces, the future of the coal mining industry in Jehol is regarded as promising.

Table 9

## COAL PRODUCTION IN MANCHOUKUO

	(Metric Tons)				
	Fengtien	Kirin	Heilungkiang	Jehol	Total
1926.....	7,205,520	251,953	195,400	201,907	7,854,780
1927.....	8,800,412	373,213	410,250	324,729	9,908,604

1928.....	8,259,551	474,387	370,400	405,225	9,509,563
1929.....	8,569,672	570,100	308,500	445,302	9,893,574
1930.....	8,524,717	523,279	177,800	544,856	9,770,652
1931.....	7,506,619	530,158	320,926	691,000	9,048,703

*Export of Coal.*—Manchurian coal has been able to exploit greater foreign markets than any other mineral product of the country, because of the cheap cost of production and the enormous deposits. Recent annual exports have reached more than four million metric tons, valued at 37 million Haikwan Taels:

Table 10

## EXPORT OF MANCHURIAN COAL\*

	Quantity (Metric Tons)	Value (Haikwan Taels)
1929.....	4,752,860	37,341,998
1930.....	4,416,245	37,132,239
1931.....	4,995,745	45,586,811

Classifying the exports of Manchurian coal by destinations, Japan and China consume the greater portion. The present coal production in Japan is sufficient to supply the entire domestic need, but Japanese coal is unable to compete with Manchurian coal, particularly Fushun coal, in view of the extreme low cost of production in Manchoukuo. China is said to possess vast deposits of coal, but as they are not yet properly exploited, she purchases much Manchurian coal.

The destinations of the coal exported from Manchoukuo in 1931 were as follows:

Table 11

## COAL EXPORTS IN 1931, CLASSIFIED BY DESTINATIONS

	(Metric Tons)	(Haikwan Taels)
Japan .....	2,517,722	22,238,341
China, Chinese Ports.....	1,990,560	18,829,338
Philippine Islands.....	154,727	1,370,610
Hongkong .....	207,684	2,040,110
Others .....	125,052	1,108,412
Total .....	4,995,745	45,586,811

*Dry Distillation of Coal.*—The Central Laboratory of the South Manchuria Railway and other scientific institutions have been experimenting with Manchurian coal. The Fushun coal particularly, containing about

\* The 1931 figures do not include the export through Aigun, the quantity being negligible.



35 per cent of volatile matter, is said to be most suitable for low-temperature dry distillation.

**Oil Shale.**—Oil shale covers the main coal seams of the Fushun coal-field, to a thickness of from 70 to 120 metres, and is estimated at 5,400 million metric tons. The quantity of oil shale which must be removed to carry out open-cut mining at Fushun will be more than 320 million metric tons.

The percentage of oil in the shale differs according to the seams, the smallest being 1%, the highest 14% and the average about 6%. Assuming the average to be 4%, more than 10 million tons of crude oil can be obtained from shale which has to be removed in the open mining district in order to mine the coal.

Regarding the utilization of the Fushun oil shale, the South Manchuria Railway Company, the Central Laboratory, and the Fushun Colliery Laboratory have studied the question from every possible point of view, both of chemistry and physics. In 1925, a method peculiar to the Fushun Colliery was discovered of dry distillation by internal heating, and the possibility of oil distillation on an economic basis was confirmed. Large-scale trials were conducted for three years, and the results obtained were so satisfactory that the Railway Company decided to open a plant for oil shale distillation, and further decided in January, 1928, to erect an oil distillation plant at Fushun with a capacity for dealing with 4,000 tons of oil shale a day or 1,360,000 tons a year, and the estimated cost of the building was to be ¥ 8,500,000. Preparations for erecting the proposed plant were immediately made, and distillation was actually commenced in 1929.

The production of oil and by-products from the commencement of the distillation work to 1931 was as follows:

**Table 12**  
(in Metric Tons)

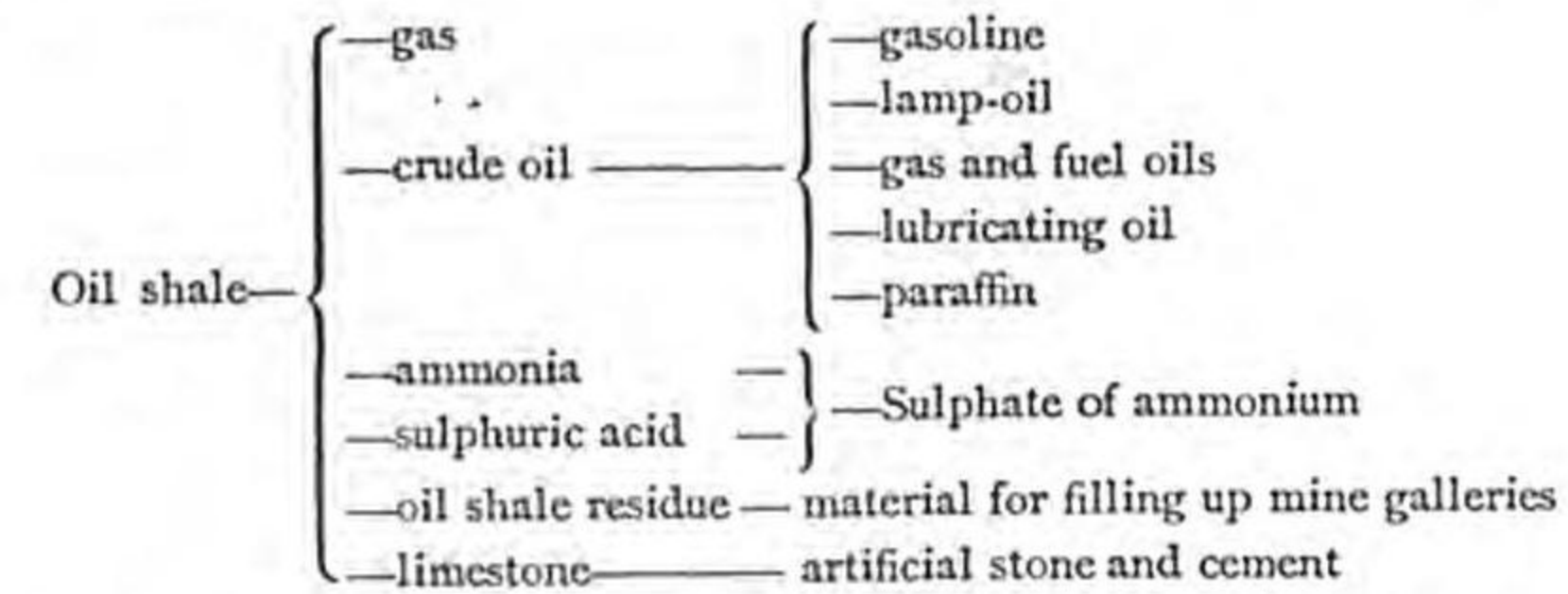
	Crude Oil	Crude Paraffin	Coke	Sulphuric Ammonia
1929 .....	—	—	—	502
1930 .....	28,578	10,606	2,685	13,332
1931 .....	40,161	12,640	3,445	15,802

The oil shale residue, after distillation, can be used as material for filling in the galleries of the coal mines.

Japan has obtained nearly 90 per cent of her paraffin supply from foreign countries, but with the materialization of this oil shale distillation

plan at Fushun, the import from countries other than Manchoukuo is being checked to some extent.

The proposed utilization of the Fushun oil shale is shown in the following diagram:



**Magnesite.**—The extent of the magnesite deposits in Manchoukuo is said to be without parallel in the world. The district which produces magnesite comprises an extensive area lying east of the Taipingshan (太平山), Tashihchiao (大石橋), Fenshui (分水) and Haicheng (海城) Stations on the South Manchuria Railway main line.

Magnesite is found alternating with the seams of dolomite, or in a lenticular shape, hemmed in by the dolomite seams, the thickness of the magnesite seam being from 2 to 200 metres. The deposit, calculating only that found above the field surface, is estimated at 384,000,000 metric tons, and the actual deposit may reach an enormous figure. Its crystals are coarse, white, brown, light pink or gray in colour, and all of good quality.

Important producing districts are Kuanmashan (官馬山), Chingshanpei (青山杯), Pingerhfang (平二房), Shengshuissu (聖水寺), and others.

A new company has been organized recently in Japan to produce metallic magnesium by utilizing the rich deposit in Manchoukuo. Formerly magnesite was used only as a material for making steel furnaces, and the production was only 36,000 metric tons in 1931. However, there is no doubt that magnesite mining will become one of the important mining enterprises in the future.

**Fire Clay.**—Some kinds of fire clay produced in Manchoukuo contain much aluminium oxide. A plan for producing aluminium by utilizing the aluminium oxide clays has been considered, and the question whether it can be economically operated or not is now being discussed. Important deposits of such fire clays are found at Wuhutsui (五湖嘴) near the border of the Kwantung Leased Territory, Yentai (煙臺), and Penhsihu (本溪

湖). As fire clay is still used only as material by ceramic works, the production is only 50,000 metric tons a year. The largest production is at Wuhutsui. A portion of the output is sent to Dairen for making fire brick and porcelain, and also a portion is exported to Japan in the crude form.

**Steatite.**—The production of Manchurian steatite is about 40,000 metric tons a year, of which the greater part is exported in crude form to Japan, where it supplies almost the entire demand, and only a small portion is powdered. It is produced in an area along the South Manchuria Railway main line from Kaiping to Haicheng, extending north-east to south-west. The important producing districts are Taling (大嶺), Shanchengtzu (山城子), Shengshuissu (聖水寺) and others.

**Dolomite.**—The limestone distributed extensively throughout Manchoukuo generally contains magnesia, sometimes to the extent of more than 20%, and this magnesia gradually turns into dolomite. The distribution of dolomite is therefore quite extensive, and while no investigation of the whole deposit has been made, the deposits in the Kwantung Leased Territory, and the Haicheng and Kaiping districts in Fengtien Province alone are estimated at an enormous amount.

Because of transport facilities, dolomite is mainly mined at Haimaotao (海猫島) and the neighbouring islands in the Kwantung Province and is shipped in crude form to the Yawata Iron Works and other Japanese factories. The production was 116,900 metric tons.

**Limestone.**—The distribution of limestone is extensive even in the Kwantung Leased Territory alone, and as its mining is simple and easy, a large quantity is used in the construction works of the Dairen harbour, as well as in various other civil engineering and construction works.

Limestone of pure quality is comparatively rare, but at Choushuitzu (周水子), in the outskirts of Dairen, there is a branch factory of the Onoda Cement Company, one of the leading cement manufacturing companies of Japan, and the local limestone is used to produce 750,000 barrels of cement annually. The limestone of Huolienchai (火連寨) on the Mukden-Antung Railway line and of Penhsihu are used at the Anshan and Penhsihu Iron Works, while that produced at Tungyuanpu (通遠堡) on the Mukden-Antung Railway line is shipped to Antung and used as material for the paper industry there. Moreover, the amount of limestone used in manufacturing lime and in the pottery industries is quite considerable.

**Quartzite.**—The quartzite found in the neighbourhood of Dairen and

Port Arthur is of very excellent quality.

The manufacture of dynus bricks is now being undertaken by the Dairen Ceramic Company, after having been thoroughly tried and studied at the Central Laboratory of the South Manchuria Railway Company, and the present production capacity is 12,000 metric tons a year, of excellent quality bricks.

The quartz vein in gneiss and granite does not yield large quantities, but the quality is pure, and snow white in colour, and is recommended as glass-making material.

**Marble and Lithographic Stone.**—At Sanshihlipu (三十里堡), Chinchou (金州), and Shihsanlitai (十三里臺) in the Kwantung Leased Territory, and at Chinchichengtzu (金家城子) in Fu-hsien (復縣) there is found vertical and vermiform limestone. It is light pink or light yellowish-red in colour, and sometimes dark grey. When polished as marble, it shows beautiful patterns with a bright lustre and is therefore used as ornamental stone.

Lithographic stone is only a recent discovery, and is mainly produced in the neighbourhood of Minchiatun (民家屯) in Fu-hsien. It is pale green in colour, and of very fine texture, the hardness being 4.5 and the specific gravity 2.7. When used as lithographic stone, the print is very clear, so that it is as good as German stone, and the cost is much less. The quarrying of this stone is thought to have a very promising future.

**Building Stone.**—Building stone produced in Manchoukuo is not so varied as that of Japan. It is mostly granite, gneiss and limestone, but sandstone, clay-slate, quartzite and other sedimentary rock are also found, while in districts north of Mukden, diorite, andesite, basalt and trachyte are regarded as useful building stones.

### Mining Policy of Manchoukuo

**Outline of Mining Policy.**—The basic principle of the mining policy of Manchoukuo is 'to exploit mineral resources, to aim at the establishment of basic industries and national defence industries, to enrich the national economy, and to increase the national wealth,' as shown in the economic policy of the Government.

As concrete policies the following have been adopted:

1. To unify the coal mines, and rationalize the coal production and supply, in order to supply fuel at low prices, and to increase the coal export.

2. Respecting the resources of minerals for national defence, the mining rights are, as a general principle, to be secured by special companies, so that they can be controlled, their reckless exploitation be prevented, and their development fostered.
3. Gold and placer gold deposits are to be divided into State-owned and others; those not owned by the State are to be opened to the general public.

According to the above mentioned basic principles, the Manchoukuo Government established the Agriculture and Mining Office (農礦司) in the Department of Industry, and commenced investigation of the mining industries and mineral deposits within the country. Also it was decided that the deposits of seven minerals, gold, lead, iron, magnesite, aluminium, special industrial coal, and petroleum would not be opened to the public.

Under the former régime, there were numerous mining enterprises operated by the Central Government directly, or by provincial governments, and those having investment relations with Kuanyinhao (provincial banks) and other political interests. These enterprises have all been confiscated by the new Government as the property of rebels. Also in all joint government and private enterprises, the government investment was usually much larger than the private investments, and thus the mineral resources which can be operated and controlled by the new Government of Manchoukuo are extensive.

**New Development of the Mining Industry.**—*Gold Mining*:—The development of the gold and placer gold mining industry will have an important bearing upon the laying of the foundation of the new State's future progress. Thus gold mining has been made a State enterprise in principle. The State-owned mines are to be either directly operated by the Government or by special companies permitted by the Government to operate them. Already a large surveying party has been despatched to the gold producing districts of Kirin and Heilungkiang Provinces, and according to the result of the survey made by the party, it is expected that joint Japanese-Manchurian co-operation for undertaking gold mining in Manchoukuo will be established.

*Coal*:—For unifying the coal mines owned by the Manchoukuo Government, namely, the Wuhutsui (五湖嘴) (or Fuchou 復州), Pataokou (八道溝) Hsinchiu (新邱), and Weimingshan (尾明山) mines, formerly operated directly by the Chang Government, the Manchurian Colliery Company, a joint Japanese-Manchurian corporation, is to be organized. The Peipiao (北票), Hsian (西安), and Haolikang (鶴立崗) mines are

operated under joint Government and private management, but the shares held by the new Government are more than one half of the total, and these mines also will be placed under the control of the proposed new company. The new company will be established with a capital of ¥16,000,000, the Manchoukuo Government and the South Manchuria Railway Company investing one-half of the capital each. Shortly it is expected that all mines will decide their respective sales fields.

In this manner, the coal mines of Manchoukuo will be divided into those directly operated by the South Manchuria Railway Company, those coming under the proposed new company, and those under Soviet-Manchurian joint management, all important mines being in some one of the above three categories.

*Petroleum*:—The petroleum industry is to be conducted by the Manchuria Petroleum Company, a joint Japanese-Manchurian corporation. The new company's capital is ¥5,000,000, invested by the Manchoukuo Government and the South Manchuria Railway Company. A plant is to be established at Dairen to refine crude oil imported from foreign countries.

*Magnesite*:—The Japan-Manchuria Magnesium Company is proposed to be established for making metallic magnesium by utilizing the magnesite ore. The new company has been established with a capital of ¥7,000,000. Through this company, the magnesite industry will make rapid development.

*Aluminium*:—The industry of producing aluminium by using the fire clay of Manchoukuo is projected on a large scale by the South Manchuria Railway Company. Experiments are shortly to be conducted. The Japanese-Manchurian Aluminium Company will undertake also the production of aluminium in Japan with the Manchurian fire clay. This company is expected to be formed with a capital of ¥5,000,000 and to have an annual production capacity of 5,000 metric tons.

The cement industry has been sanctioned as a private industry, and not only has a new company already been established, but expansion of the existing plants also is being made.

### Geological Institutions

Geological studies of Manchuria had previously been made by Japanese and other foreign scientists, but a systematic study was first undertaken by the Geological Institute established by the South Manchuria

Railway Company. The Institute is one of the two great scientific institutions existing in Manchuria and Mongolia, the other being the Central Laboratory which is also under the management of the South Manchuria Railway Company.

At first the attention of the institute was mainly directed to the geological study of Manchuria and the investigation of the coal-field at Fushun, but it later extended its studies to the remoter regions of Manchuria and Mongolia. The reputation and standing of the institute are already recognized by scientific circles at home and abroad. The systematic geological study of South Manchuria, for instance, was made possible only by many years' efforts on the part of the institute, while it has also extended its attention to Siberia and many parts of China, and has made possible the discovery of important mineral producing districts, the study of mineral deposits and fundamental researches in the management of mines, particularly as regards the economic value of mineral deposits.

The institute has published in nine large volumes the results of its investigations of varieties, qualities, deposits and distribution of minerals in Manchuria, Mongolia, Siberia and North China. In 1918 it completed the South Manchuria geological map on a scale of 1/1,000,000, making the general outline of the geological condition of the district known to the world, and a yet more detailed map on a scale of 1/400,000 is planned. Dividing South Manchuria into sections of 2° long. by 1.5° lat. the institute started to map South Manchuria, beginning with the southern sections, and already the maps of several sections have been completed and published. The North China Mining Report is issued by the institute four times a year, containing studies and references concerning the geology and mining industry of Manchuria and Mongolia, while numerous other volumes of geological maps, geological studies, reports on mineral producing districts and mineral deposits, and reports on the mining industry have been issued.

The institute collects geological specimens of Manchuria, Mongolia, China, and Siberia as well as of European countries. The total number of diagrams, maps and specimens collected is more than 3,000, and among the specimens are some of great value. Most of these have recently been moved to the Manchuria-Mongolia Resources Museum of the South Manchuria Railway Company in Dairen for exhibition to the public.

Table 13  
MINERAL PRODUCTION IN MANCHOUKUO

	(Metric Tons)					
	Average of 1918-1922	Average of 1923-1927	1928	1929	1930	1931
Iron ore.....	208,268	541,762	710,286	985,671	832,228	922,649
Sulphuric iron ...	1,537	2,802	4,266	5,057	3,028	3,919
Gold .....(1)	unknown	unknown	999	595	1,478	1,121
Lead ore .....(2)	670	(3) 1,606	366	1,450	—	—
Coal .....(4)	3,886,153	7,373,483	9,509,563	9,893,574	9,770,652	9,048,703
Magnesite .....(5)	4,463	13,603	25,455	31,681	29,016	36,034
Limestone.....	120,640	268,528	471,710	629,502	688,489	545,131
Fire-clay .....	12,707	65,942	64,083	64,639	53,664	35,476
Silica.....	8,114	(6) 13,005	20,597	19,624	20,000	22,327
Steatite .....	10,758	23,962	35,000	40,000	25,726	40,092
Oil shale .....	—	—	—	—	981,004	1,245,094
Shale oil .....	—	—	—	—	47,815	61,081
Pig-iron.....	92,333	164,738	283,667	294,158	348,053	342,269
Coke .....	145,016	234,766	343,741	388,307	485,321	418,625

(1) In Kilogramme.

(2) Average of 1921-1922.

(3) Average of 4 years excepting 1925.

(4) Figures for the years up to 1924 do not include North Kirin and Heilungkiang.

(5) Average of 1920-1922.

(6) Average of 1923-1926.

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## CHAPTER XIV INDUSTRY

### General Outline

Though Manchuria is favoured with resources of varied industrial raw materials, modern industry did not develop until about thirty years ago. Oil milling, flour milling, kaoliang spirit distillation, paper manufacturing, and certain iron, salt, ceramic, leather and hide, and other native, primitive household industries existed to supply the needs of immediate neighbourhoods.

With the eastern advance of Russian influence and the establishment of Russian administration in Manchuria, towards the end of the 19th century, machine flour milling, lumbering, and two or three other modern industries appeared. Before any general industrial development could take place, however, the Russo-Japanese War (1904-5) broke out, and as the result of the war, Japan came to administer the Kwantung Leased Territory and the railway zone. Since that time, modern industry has been developed in Manchuria, and particularly in the Kwantung Leased Territory and the South Manchuria Railway Zone by the Japanese.

Stimulated by the progress of industries undertaken by the Japanese, those operated by the Manchurians likewise rapidly developed. Particularly in the oil milling, flour milling, brick making, and tussah silk filature industries, the number of plants operated by the Manchurians greatly surpassed the Japanese establishments. But Manchurian industries with modern equipment are comparatively few, although the Mukden Spinning and Weaving Factory (奉天紡紗廠), and the Mukden Ordnance Works (奉天兵工廠) are up-to-date in equipment and gigantic in scale, and may be called the representative Manchurian factories.

**Industry in the North Manchuria Railway Districts and in the Interior.**— Statistics of industry in the North Manchuria Railway districts and in the interior are not available, and only a general survey can be given.

In North Manchuria, flour milling plants were established at Harbin about 1902 to supply flour to the Russian troops and Russian residents who rapidly increased following the opening of the North Manchuria Railway, and the administration of Port Arthur and Dairen by Russia.

About the same time European style alcohol distilling was started by Russian business men, and there soon appeared several distilleries. During the Russo-Japanese War, Harbin became the supply headquarters of the Russian troops, and as enormous quantities of supplies were purchased there, various industries were stimulated to sudden development. Thus in 1904 and 1905 there were erected factories for the production of flour, alcohol, beer, soap, leather, furniture, machinery, and other articles. Many of these industries were, however, forced into bankruptcy on account of the post-war economic depression, and the abolition of the 50 verst free trade zone on the Russo-Chinese border in 1912. Yet even after the war, new plants for various industries continued to appear in North Manchuria.

In the North Manchuria Railway districts, various new factories were erected after 1916 notably in Harbin and its vicinity, and particularly the oil milling and flour milling industries made special development, stimulated by the shortage of foodstuffs caused by the Great War. In these districts, it is noteworthy that plants operated by Manchurians are quite numerous, contrary to the condition in the South Manchuria Railway district. This situation is believed to have been caused by the fact that Russia did not originally possess much capital and particularly after entering the Great War she had no time to make investments in foreign countries and lost her investment ability entirely; thus Manchurian capital had no competition. Of course, these establishments in North Manchuria are inferior to those in South Manchuria in capital and equipment, there being only some fairly large and well equipped oil and flour milling plants.

The North Manchurian industry that made phenomenal development during the Great War found itself in extreme financial difficulties when the depression came after the close of the war. In 1923, half of the flour mills at Harbin were in a bankrupt condition, and those existing today are still in a state of depression. Oil milling, one of the two greatest industries of North Manchuria, was obliged to suspend production entirely in 1921. Only by the drastic measures adopted by the North Manchuria Railway of radically lowering the freight rate on bean oil and beancake for shipment to Vladivostok and erecting bean oil tanks at Vladivostok, did the oil mills at Harbin manage to make a gradual revival, but they are operating only at half of their capacity, as is the case also with the flour mills.

Manchurian factories in the interior of Manchuria, excepting those in the South Manchuria Railway and the North Manchuria Railway districts, showed a surprising increase in number during the period from 1900 to the Great War, but the increase was shown only in small plants established

with capital of several thousand yen. Even during the Great War, it was only small and medium sized enterprises, possessing capital of some tens of thousands of yen, that appeared in the tussah silk filature industry, in the weaving and knitting industry and in the oil extraction industry.

**Industry in the Kwantung Leased Territory and the South Manchuria Railway Zone.**—Generally speaking, the majority of modern industrial plants of Manchoukuo being centred in the Kwantung Leased Territory and the South Manchuria Railway Zone, the industries of the Leased Territory and the Railway Zone may be regarded as representing the industries of the entire territory of Manchoukuo. Respecting the industries of these districts, there are available minute statistics prepared by the Kwantung Government.

It was about 1907 that modern industrial plants were established in the Kwantung Leased Territory and the South Manchuria Railway Zone, those first erected being mainly oil mills and brick factories. Later, at Dairen was established a branch factory of the Kawasaki Dockyards of Japan, at Chousuitsu the Onoda Cement Factory, and at Tichling the Manchuria Flour Mill. At the end of 1909, factories employing more than 5 workmen a day numbered 152, with a total registered capital of ¥16,000,000, and an annual production of ¥6,000,000. Soon iron, lumber, flour, ice, glass, and other industries developed. The S. M. R. Railway Works at Shahokou was completed in 1911. During the Great War, enterprise schemes became suddenly numerous and active; 1919 was the golden year of enterprise activities in Manchuria, and not only were various new industries started, but also small individually operated industries were changed to stock company organizations of large scale. Thus the industry of Manchuria underwent a sudden and complete change. When the panic of 1920 came, those less firmly established succumbed, some suspending operations, some closing down, and some bankrupting. The progress that had been started by Manchurian industry was checked.

Then came the period of readjustment, and enterprises without any prospect of revival disappeared, while on the other hand, new industries appeared. Cotton spinning, tussah and silk filature, plate glass, oil shale, and other new industries developed, with the result that Manchurian industry has thus gradually come to possess some solidity.

In this connection, it deserves to be noted that the industry in the Kwantung Leased Territory and the South Manchuria Railway Zone, and particularly of the Japanese, is being gradually oppressed by the industry of Manchoukuo.

**Table I**  
MANUFACTURING INDUSTRY IN THE KWANTUNG LEASED TERRITORY, THE S.M.R. ZONE AND THE CONSULAR DISTRICTS\*

	Textile Industry			Machine Manufacturing Industry			Chemical Industry			Comestibles Manufacturing Industry		
	No. of Factories	Average No. of Employed Workers	Capital (in 1,000 Yen)	No. of Factories	Average No. of Employed Workers	Capital (in 1,000 Yen)	No. of Factories	Average No. of Employed Workers	Capital (in 1,000 Yen)	No. of Factories	Average No. of Employed Workers	Capital (in 1,000 Yen)
1922.....	30	3,212	19,049	107	6,356	21,444	238	8,869	79,949	126	2,313	44,347
1923.....	26	2,036	15,225	104	5,460	18,721	245	8,107	53,928	122	2,088	43,159
1924.....	35	1,487	9,397	103	6,145	21,723	228	8,337	55,580	137	3,797	47,190
1925.....	47	5,041	63,413	118	6,419	20,310	191	5,803	63,140	167	3,819	53,119
1926.....	47	9,124	63,798	116	5,923	19,832	207	7,982	63,267	165	3,310	41,619
1927.....	49	6,540	64,613	121	5,633	19,743	230	9,158	67,482	180	4,369	38,464
1928.....	66	7,312	64,108	139	9,770	40,279	228	8,749	77,320	183	3,532	82,003
1929.....(65)	(7,304)	(60,935)	(151)	(11,991)	(44,103)	(206)	(8,413)	(84,737)	(177)	(3,850)	(78,174)	
1930.....(74)	(6,954)	(58,110)	(154)	(10,586)	(43,906)	(229)	(10,132)	(103,977)	(182)	(3,761)	(79,887)	
1931.....(73)	(5,680)	(58,375)	(149)	(7,063)	(106,876)	(222)	(9,244)	(114,469)	(177)	(3,448)	(48,237)	
	Miscellaneous Industries			Special Industries**			Total					
	No. of Factories	Average No. of Employed Workers	Capital (in 1,000 Yen)	No. of Factories	Average No. of Employed Workers	Capital (in 1,000 Yen)	No. of Factories	Average No. of Employed Workers	Capital (in 1,000 Yen)			
1922.....	133	3,182	27,234	3	2,565	34,756	637	26,496	226,778			
1923.....	133	3,897	34,827	3	1,837	34,968	633	23,425	200,828			
1924.....	127	3,402	21,500	28	4,656	37,546	658	27,823	192,937			
1925.....	124	3,236	16,242	27	57,088	30,894	674	81,407	247,119			
1926.....	125	3,275	15,373	25	6,006	97,790	685	35,619	301,679			
1927.....	144	4,256	13,200	26	5,489	88,502	750	35,445	292,002			
1928.....	144	4,576	10,308	25	1,580	48,447	785	35,519	322,467			
1929.....(164)	(4,158)	(8,648)	(26)	(1,466)	(25,484)	(789)	(37,182)	(302,080)				
1930.....(185)	(4,205)	(11,295)	(23)	(1,015)	(27,147)	(847)	(36,654)	(324,322)				
1931.....(188)	(3,760)	(13,228)	(19)	(739)	(47,992)	(828)	(29,934)	(389,177)				

\* Figures given are based on the statistical survey carried out by the Kwantung Government and include, besides the Kwantung Leased Territory and Railway Zone, the districts under the jurisdiction of Japanese Consuls or Consular Police of Newchwang, Liaoyang, Antung, Tichling, Hsinking and Mukden. Factories which do not employ more than five workers are excluded from this survey. The figures in parentheses, however, do not include the Consular or Consular Police districts.

\*\* In the figures for 1922-23 under the item of 'Special Industry' only those of metal industry is included. But the figures for 1924-27 under the same item include not only those of metal industry but also those of electric and gas industries, while from the figures for 1928-31 those of metal refining industry are excluded as they are included in the figures under 'Machine Manufacturing Industry.'

with capital of several thousand yen. Even during the Great War, it was only small and medium sized enterprises, possessing capital of some tens of thousands of yen, that appeared in the tussah silk filature industry, in the weaving and knitting industry and in the oil extraction industry.

**Industry in the Kwantung Leased Territory and the South Manchuria Railway Zone.**—Generally speaking, the majority of modern industrial plants of Manchoukuo being centred in the Kwantung Leased Territory and the South Manchuria Railway Zone, the industries of the Leased Territory and the Railway Zone may be regarded as representing the industries of the entire territory of Manchoukuo. Respecting the industries of these districts, there are available minute statistics prepared by the Kwantung Government.

It was about 1907 that modern industrial plants were established in the Kwantung Leased Territory and the South Manchuria Railway Zone, those first erected being mainly oil mills and brick factories. Later, at Dairen was established a branch factory of the Kawasaki Dockyards of Japan, at Chousuitzu the Onoda Cement Factory, and at Tiehling the Manchuria Flour Mill. At the end of 1909, factories employing more than 5 workmen a day numbered 152, with a total registered capital of ¥16,000,000, and an annual production of ¥6,000,000. Soon iron, lumber, flour, ice, glass, and other industries developed. The S. M. R. Railway Works at Shahokou was completed in 1911. During the Great War, enterprise schemes became suddenly numerous and active; 1919 was the golden year of enterprise activities in Manchuria, and not only were various new industries started, but also small individually operated industries were changed to stock company organizations of large scale. Thus the industry of Manchuria underwent a sudden and complete change. When the panic of 1920 came, those less firmly established succumbed, some suspending operations, some closing down, and some bankrupting. The progress that had been started by Manchurian industry was checked.

Then came the period of readjustment, and enterprises without any prospect of revival disappeared, while on the other hand, new industries appeared. Cotton spinning, tussah and silk filature, plate glass, oil shale, and other new industries developed, with the result that Manchurian industry has thus gradually come to possess some solidity.

In this connection, it deserves to be noted that the industry in the Kwantung Leased Territory and the South Manchuria Railway Zone, and particularly of the Japanese, is being gradually oppressed by the industry of Manchoukuo.

**Table 1**  
**MANUFACTURING INDUSTRY IN THE KWANTUNG LEASED TERRITORY, THE S.M.R. ZONE AND THE CONSULAR DISTRICTS\***

	Textile Industry			Machine Manufacturing Industry			Chemical Industry			Comestibles Manufacturing Industry		
	No. of Factories	No. of Average Employed Workers	Capital (in 1,000 Yen)	No. of Factories	No. of Average Employed Workers	Capital (in 1,000 Yen)	No. of Factories	No. of Average Employed Workers	Capital (in 1,000 Yen)	No. of Factories	No. of Average Employed Workers	Capital (in 1,000 Yen)
1922.....	30	3,212	19,049	107	6,356	21,444	238	8,869	79,949	126	2,313	44,347
1923.....	26	2,036	15,225	104	5,460	18,721	245	8,107	53,928	122	2,088	43,159
1924.....	35	1,487	9,397	103	6,145	21,723	228	8,337	55,580	137	3,797	47,190
1925.....	47	5,041	63,413	118	6,419	20,310	191	5,803	63,140	167	3,819	53,119
1926.....	47	9,124	63,798	116	5,923	19,832	207	7,982	63,267	165	3,310	41,619
1927.....	49	6,540	64,613	121	5,633	19,743	230	9,158	67,482	180	4,369	38,464
1928.....	66	7,312	64,108	139	9,770	40,279	228	8,749	77,320	183	3,532	82,003
1929.....	(65)	(7,304)	(60,935)	(151)	(11,991)	(44,103)	(206)	(8,413)	(84,737)	(177)	(3,850)	(78,174)
1930.....	(74)	(6,954)	(58,110)	(154)	(10,586)	(43,906)	(229)	(10,132)	(103,977)	(182)	(3,761)	(79,887)
1931.....	(73)	(5,680)	(58,375)	(149)	(7,063)	(106,876)	(222)	(9,244)	(114,469)	(177)	(3,448)	(48,237)
	Miscellaneous Industries			Special Industries**			Total					
	No. of Factories	No. of Average Employed Workers	Capital (in 1,000 Yen)	No. of Factories	No. of Average Employed Workers	Capital (in 1,000 Yen)	No. of Factories	No. of Average Employed Workers	Capital (in 1,000 Yen)			
1922.....	133	3,182	27,234	3	2,565	34,756	637	26,496	226,778			
1923.....	133	3,897	34,827	3	1,837	34,968	633	23,425	200,828			
1924.....	127	3,402	21,500	28	4,656	37,546	658	27,823	192,937			
1925.....	124	3,236	16,242	27	57,088	30,894	674	81,407	247,119			
1926.....	125	3,275	15,373	25	6,006	97,790	(655)	(31,040)	(294,738)			
1927.....	144	4,256	13,200	26	5,489	88,502	685	35,619	301,679			
1928.....	144	4,576	10,308	25	1,580	48,447	(717)	(32,860)	(284,507)			
1929.....	(164)	(4,158)	(8,648)	(26)	(1,466)	(25,484)	750	35,445	292,002			
1930.....	(185)	(4,205)	(11,295)	(23)	(1,015)	(27,147)	(748)	(32,792)	(304,251)			
1931.....	(188)	(3,760)	(13,228)	(19)	(739)	(47,992)	785	35,519	322,467			
							(847)	(36,654)	(324,322)			
							(828)	(29,934)	(389,177)			

\* Figures given are based on the statistical survey carried out by the Kwantung Government and include, besides the Kwantung Leased Territory and Railway Zone, the districts under the jurisdiction of Japanese Consuls or Consular Police of Newchwang, Liaoyang, Antung, Tiehling, Hsinking and Mukden. Factories which do not employ more than five workers are excluded from this survey. The figures in parentheses, however, do not include the Consular or Consular Police districts.

\*\* In the figures for 1922-23 under the item of 'Special Industry' only those of metal industry is included. But the figures for 1924-27 under the same item include not only those of metal industry but also those of electric and gas industries, while from the figures for 1928-31 those of metal refining industry are excluded as they are included in the figures under 'Machine Manufacturing Industry.'

Table 2

## DISTRIBUTION OF FACTORIES IN THE KWANTUNG LEASED TERRITORY AND THE S.M.R. ZONE (1931)

Kwantung Leased Territory	Number of Factories	Capital (Yen)
Dairen.....	350	221,399,856
Chinchow.....	43	5,044,800
Pulantien.....	2	90,000
Pitzuwo.....	16	6,138,300
Total.....	460	238,160,986
<b>S.M.R. Zone</b>		
Wafangtien.....	8	245,000
Tashichiao.....	18	518,000
Yingkow.....	6	13,690,000
Anshan.....	12	28,812,890
Liaoyang.....	10	2,880,000
Mukden.....	47	12,516,000
Penhsihu.....	3	42,000
Antung.....	81	58,447,813
Fushun.....	61	23,582,240
Tiehling.....	11	1,107,400
Kaiyuan.....	27	480,050
Ssuping kai.....	27	300,840
Kungchuling.....	11	721,800
Hsinking.....	46	7,672,200
Total.....	368	151,016,233
<b>Grand Total.....</b>	<b>828</b>	<b>389,177,219</b>

Table 3

## COMPANIES IN THE KWANTUNG LEASED TERRITORY AND THE S.M.R. ZONE CLASSIFIED BY NATURE OF INDUSTRY (1931)

Textile Industry	Kwantung Leased Territory		S.M.R. Zone		Total	
	No. of Companies	Paid-up Capital or Capital Invested (Yen)	No. of Companies	Paid-up Capital or Capital Invested (Yen)	No. of Companies	Paid-up Capital or Capital Invested (Yen)
Filature.....	1	250,000	—	—	1	250,000
Cotton yarn manufacture.....	1	1,200,000	1	1,875,000	2	3,075,000
Hemp fibre manufacture.....	1	250,000	—	—	1	250,000
Cotton piece goods manufacture.....	—	—	1	21,000	1	21,000
Silk piece goods and silk mixture manufacture.....	1	40,000	—	—	1	40,000

	Kwantung Leased Territory		S.M.R. Zone		Total	
	No. of Companies	Paid-up Capital or Capital Invested (Yen)	No. of Companies	Paid-up Capital or Capital Invested (Yen)	No. of Companies	Paid-up Capital or Capital Invested (Yen)
Hemp piece goods and hemp mixture manufacture.....	1	100,000	1	750,000	2	850,000
Woollen piece goods and woollen mixture manufacture.....	—	—	—	—	—	—
Other textile manufacture.....	2	22,500	—	—	2	22,500
Dyeing.....	2	32,000	1	50,000	3	82,000
Bleaching.....	2	137,500	3	16,200	5	153,700
Cotton-wool manufacture.....	3	295,000	—	—	3	295,000
Hosiery manufacture.....	1	3,000	1	6,000	2	9,000
Total.....	15	2,330,000	8	2,718,200	23	5,048,200
<b>Metal Industry</b>						
Manufacture of metal materials.....	2	13,000	—	—	2	13,000
Casting.....	5	335,000	1	80,000	6	415,000
Other metal goods manufacture.....	7	631,000	1	24,000	8	655,000
Gilding.....	—	—	—	—	—	—
Total.....	14	979,000	2	104,000	16	1,083,000
<b>Machine and Utensils Manufacturing Industry</b>						
Electric machine and apparatus manufacture.....	5	217,000	1	50,000	6	267,000
Manufacture of manufacturing machine and tools.....	4	1,160,000	3	92,000	7	1,252,000
Scientific instruments manufacture.....	1	5,000	—	—	1	5,000
Vehicle manufacture.....	5	39,600	—	—	5	39,600
Shipbuilding.....	2	702,000	—	—	2	702,000
Other machine and utensils manufacture.....	1	6,000	—	—	1	6,000
Total.....	18	2,129,600	4	142,000	22	2,271,600
<b>Chemical Industry</b>						
Pottery manufacture.....	3	93,500	—	—	3	93,500
Glass manufacture.....	6	1,446,000	1	6,000	7	1,452,000
Cement and lime manufacture.....	1	280,000	2	175,000	3	455,000
Brick manufacture.....	7	805,000	16	1,935,500	23	2,740,500



	Kwantung Leased Territory		S.M.R. Zone		Total	
	No. of Companies	Paid-up Capital or Capital Invested (Yen)	No. of Companies	Paid-up Capital or Capital Invested (Yen)	No. of Companies	Paid-up Capital or Capital Invested (Yen)
Other ceramic industry .....	4	441,000	1	100,000	5	541,000
Paper manufacture ...	2	208,500	2	4,060,000	4	4,268,500
Match manufacture ...	2	200,000	—	—	2	200,000
Rubber manufacture...	3	139,000	1	500,000	4	639,000
Bean oil and fat manufacture .....	9	4,772,500	4	1,252,500	13	6,025,000
Medicine manufacture.	8	731,500	2	180,000	10	911,500
Industrial chemicals manufacture .....	5	226,500	2	625,000	7	851,500
Dye manufacture .....	3	1,165,000	—	—	3	1,165,000
Paint and colour manufacture .....	6	365,000	2	180,000	8	545,000
Soap and toilet requisite manufacture.	3	344,000	1	35,000	4	379,000
Fertilizer manufacture .....	4	1,125,000	—	—	4	1,125,000
Other chemical industry .....	3	35,000	2	49,500	5	84,500
Total .....	69	12,377,500	36	9,098,500	105	21,476,000
<b>Comestible Industry</b>						
Refining and flour milling .....	6	463,000	10	5,249,200	16	5,712,200
Brewing .....	6	464,000	9	491,000	15	955,000
Miso and soy manufacture .....	12	593,000	2	120,000	14	713,000
Beverage manufacture	1	20,000	2	82,000	3	102,000
Ice manufacture .....	2	750,000	1	110,000	3	860,000
Sugar manufacture ...	1	300,000	1	8,500,000	2	8,800,000
Baking and sweet manufacture .....	8	236,500	4	33,500	12	270,000
Cigarette manufacture.	2	31,300	2	102,500	4	133,800
Other comestible industry .....	7	1,071,000	1	1,500	8	1,072,500
Total .....	45	3,928,800	32	14,689,700	77	18,618,500
<b>Miscellaneous Industry</b>						
Timber industry and wooden goods manufacture .....	15	1,086,000	13	1,294,500	28	2,380,500
Printing and book-binding .....	7	387,000	8	644,500	15	1,031,500

	Kwantung Leased Territory		S.M.R. Zone		Total	
	No. of Companies	Paid-up Capital or Capital Invested (Yen)	No. of Companies	Paid-up Capital or Capital Invested (Yen)	No. of Companies	Paid-up Capital or Capital Invested (Yen)
Paper goods manufacture .....	4	13,200	1	1,000	5	14,200
Manufacture of leather, hides and goods thereof .....	9	168,500	1	20,000	10	188,500
Clothing and other sewed goods manufacture .....	6	151,500	2	22,500	8	174,000
Building contracting...	53	7,381,500	19	1,248,700	72	8,630,200
Other miscellaneous industry .....	18	245,800	3	48,000	21	293,800
Total .....	112	9,433,500	47	3,279,200	159	12,712,700
<b>Special Industry</b>						
Electric industry .....	1	22,000,000	9	3,087,500	10	25,087,500
Gas industry .....	1	9,300,000	—	—	1	9,300,000
Total .....	2	31,300,000	9	3,087,500	11	34,387,500
<b>Grand Total ...</b>	<b>275</b>	<b>62,478,400</b>	<b>138</b>	<b>33,119,100</b>	<b>413</b>	<b>95,597,500</b>

Table 4

PRODUCTION OF MANUFACTURING INDUSTRY IN THE KWANTUNG LEASED TERRITORY, S.M.R. ZONE AND CONSULAR DISTRICTS

(1,000 Yen)

	Kwantung Leased Territory	S.M.R. Zone	Consular Districts	Total
1915.....	24,386	8,606	6,760	39,752
1916.....	37,801	9,730	6,018	53,549
1917.....	57,083	25,709	6,897	89,689
1918.....	80,844	24,517	7,712	113,073
1919.....	125,964	32,041	11,945	169,950
1920.....	57,223	23,840	8,886	89,949
1921.....	73,911	29,406	9,431	112,748
1922.....	75,083	29,863	11,095	116,041
1923.....	94,959	46,908	3,694	145,561
1924.....	102,105	42,894	1,604	146,603
1925.....	113,156	49,281	2,023	164,460
1926.....	137,130	41,210	2,768	181,108
1927.....	97,788	46,720	4,022	148,530
1928.....	89,635	55,360	2,869	147,864
1929.....	77,691	49,224	—	126,915
1930.....	62,661	41,324	—	103,985
1931.....	59,607	30,273	—	89,880

Table 5  
MANUFACTURING PRODUCTION IN THE KWANTUNG LEASED TERRITORY  
AND THE S.M.R. ZONE

	1931 (in ¥ 1,000)																
	1928			1929			1930			Kwantung Leased Territory			S.M.R. Zone			Total	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	
Cotton Thread .....	—	6,969	—	8,924	—	8,551	—	5,099	—	2,076	—	7,175					
Silk Thread .....	—	251	—	304	—	318	—	172	—	39	—	211					
Tussah Silk Thread.....	—	538	—	178	—	42	—	—	—	49	—	49					
Hemp Fibre .....	—	18	—	31	—	—	—	—	—	—	—	—					
Cotton Wool.....	—	750	—	1,154	—	570	—	153	—	125	—	278					
Textile Goods .....	—	2,495	—	3,063	—	1,599	—	232	—	1,038	—	1,270					
Gunny Bags* .....	7,129	2,334	7,929	2,448	2,916	862	3,700	736	—	—	3,700	736					
Steel† .....	110	324	170	360	187	581	127	380	—	—	127	380					
Pig Iron†† .....	221	9,837	218	9,744	261	10,138	—	—	277	7,103	277	7,103					
Cast Iron†† .....	283	50	140	41	78	21	—	—	62	19	62	19					
Cast Iron Goods .....	—	64	—	141	—	187	—	111	—	33	—	144					
Bricks* .....	68,788	1,127	77,658	1,690	99,308	1,324	44,140	369	6,513	185	50,653	554					
Tiles .....	986	26	1,699	60	3,720	123	1,416	26	339	59	1,755	85					
Cement* .....	158	3,719	206	4,327	189	3,271	158	1,890	—	—	158	1,890					
Lime* .....	11	68	9	62	8	40	6	25	17	57	23	82					
Glass .....	—	2,697	—	2,174	—	1,771	—	918	—	23	—	941					
Bean Oil†† .....	90	23,891	71	17,828	65	14,149	103	13,384	7	886	110	14,270					
Beancakes* .....	25,164	49,973	23,821	42,695	32,360	31,259	32,033	30,092	1,973	1,571	34,006	31,663					
Other Oils .....	—	594	—	561	—	830	—	1,284	—	833	—	2,117					
Medicine .....	—	1,489	—	1,653	—	2,909	—	195	—	2,448	—	2,643					
Soap .....	—	191	—	226	—	237	—	161	—	45	—	206					
Talc .....	—	63	—	44	—	37	—	—	—	19	—	19					
Candles .....	—	77	—	86	—	764	—	48	—	1,067	—	1,115					

	1931																
	1928			1929			1930			Territory			S.M.R. Zone			Total	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	
Dyes .....	—	175	—	126	—	71	—	46	—	—	—	—	—	—	—	46	
Paints... ..	—	1,152	—	1,731	—	1,504	—	635	—	357	—	992					
Fertilizer .....	—	13,934	—	1,497	—	2,395	—	398	—	1,318	—	1,716					
Rubber Goods .....	—	56	—	32	—	12	—	8	—	33	—	41					
Paper.....	—	1,917	—	1,796	—	1,863	—	71	—	1,260	—	1,331					
Matches.....	—	337	—	338	—	600	—	79	—	316	—	395					
Sugar.....	—	—	—	—	—	—	—	—	—	—	—	—					
Alcohol.....	—	—	—	—	—	—	—	—	—	—	—	—					
Japanese Sake‡ .....	600	228	503	189	622	231	397	102	406	142	803	244					
Chinese Liquor‡ .....	6,686	1,892	7,461	1,833	6,487	1,428	1,296	293	3,809	656	5,105	949					
Miso† .....	2,068	305	1,905	280	2,089	264	1,407	134	1,018	97	2,425	231					
Soy‡ .....	4,390	704	4,835	691	3,618	562	2,689	351	1,090	170	3,779	521					
Flour* .....	1,079	3,182	2,854	8,632	2,252	5,890	—	—	725	1,126	725	1,126					
Confectionery & Bread ..	—	648	—	531	—	591	—	326	—	281	—	607					
Starch† .....	722	374	736	383	991	103	1,000	103	—	—	1,000	103					
Beverage .....	—	89	—	101	—	151	—	75	—	16	—	92					
Ice† .....	15,827	243	21,918	366	17,553	266	22,791	243	2,279	18	25,070	261					
Tobacco .....	—	5,982	—	4,985	—	4,099	—	113	—	3,434	—	3,547					
Vehicle .....	—	78	—	122	—	54	—	37	—	7	—	44					
Baskets .....	—	—	—	—	—	—	—	—	—	18	—	18					
Match Splints .....	—	241	—	215	—	101	—	—	—	782	—	782					
Timber .....	—	5,751	—	4,496	—	3,456	—	700	—	2,331	—	3,031					
Furniture .....	—	125	—	321	—	381	—	233	—	68	—	301					
Asbestos .....	—	22	—	25	—	29	—	28	—	—	—	28					
Leather & Hides .....	—	19	—	432	—	355	—	360	—	168	—	528					
Total .....	—	144,995	—	126,915	—	103,985	—	59,607	—	30,273	—	89,880					

\* 1,000 pieces or bags † metric ton †† 1,000 metric tons ‡ 1,000 litres

**Industry of Manchoukuo in 1931.**—As already explained, there are no available materials to afford a general view of the industry of Manchoukuo, and only comparatively detailed historical materials can be obtained in respect of the industry of the Kwantung Leased Territory and the South Manchuria Railway Zone. But with the establishment of Manchoukuo in 1932, statistics of the entire industry of Manchoukuo for the year 1931 were compiled by the Economic Research Committee of the S.M.R. Co., and published in the Industrial Statistics of Manchoukuo. These statistics having been compiled immediately after the Manchurian incident, and there being no comprehensive materials originally on the Manchoukuo side, they are incomplete, and notes given by the Economic Research Committee have been added to the following tables.

Though the statistics thus are imperfect, in the present volume we have to satisfy ourselves by viewing the general condition of the industry of Manchoukuo by making them the principal material. But as not only industrial statistics but also various other statistics are being prepared by Manchoukuo, it may not be long before we shall be able to describe the industry of Manchoukuo upon the basis of well compiled and comparatively accurate information.

At any rate, the general condition of the industry of Manchoukuo in 1931 can be explained as follows, according to the Industrial Statistics of Manchoukuo published by the above-mentioned Economic Research Committee of the South Manchuria Railway Company.

INDUSTRY

**Table 6**  
NUMBER OF FACTORIES CLASSIFIED BY THE NUMBER OF WORKMEN\*

Industry	Less than 10 workmen		10 to 30 workmen		30 to 100 workmen		More than 100 workmen		Unknown		Total		Grand Total
	Japa- nese	Man- churian	Japa- nese	Man- churian	Japa- nese	Man- churian	Japa- nese	Man- churian	Japa- nese	Man- churian	Japa- nese	Man- churian	
Metal	17 [3]	52 [13]	17 [13]	8	7 [2]	1	2	—	—	—	43 [18]	63	106 [18]
Machinery & Utensils	8 [3]	41	32 [20]	14 [2]	19 [6]	17 [2]	18 [2]	18	—	17	77 [31]	107 [4]	184 [35]
Ceramic	11	22	17 [2]	16	10 [4]	9	6 [2]	1	37 (9)	299 (11)	81 (9)[8]	347 (11)	428 (20)[8]
Textile	3	71	2	71	5	22	7	10	(1)	42 (2)	...17 (1)	216 (2)	233 (3)
Chemical	9	96 [4]	9	46	16	67	18	15	1	152 (32)	...53 (2)	376 (32)[4]	429 (34)[4]
Comestible	34	49	20	14	13	7	5	1	2	45 (4)	74 (7)	116 (4)	190 (11)
Brewing	16	34	15 [1]	37 [2]	4	8	—	—	(2)	3 (3)	35 (2)[2]	82 (3)[2]	117 (5)[4]
Miscellaneous	42	72 [1]	55	40 [1]	30	3	7	—	(3)	13	134 (3)	128 (2)	262 (3)[2]
<b>Total</b>	<b>140</b> [6]	<b>437</b> [5]	<b>167</b> [36]	<b>246</b> [5]	<b>104</b> [13]	<b>134</b> [2]	<b>63</b> [4]	<b>45</b>	<b>40</b> (24)	<b>573</b> (52)	<b>514</b> (24)[59]	<b>1,435</b> (52)[12]	<b>1,949</b> (76)[71]

\* Refer to the notes given on page 362.

## Notes:

1. Although it was intended to cover the entire area of Manchoukuo in these statistics, some items are limited to South Manchuria, as the investigation in North Manchuria did not progress as originally intended on account of the Manchurian incident.
2. In principle factories that have a standing force of more than five workmen are included, but there are some exceptions.
3. The classification of Japanese and Manchurian is made according to the nationality of the factory operators.
4. The number of factories is given by calculating each operated in a different locality.
5. In the number of factories, the figure in ( ) marks those suspending operations, and that in [ ] indicates those producing the products in question as a subsidiary production. (Figures thus marked belong to the figures above them). In figures for capital and other items for factories producing the products in question as subsidiary products, if the figures for the said particular products are not known, the total figures for such factories are given in [ ], which are not included in the totals for the respective items.
6. The total of capital gives the total of figures, regardless of currency standards, but only Fengtien Tayang, Fengtien Hsiaoyang, Kirin Kuantieh, and Heilungkiang Kuantieh are calculated in the new currency according to the official rates of exchange.
7. When the capital amount for branch factories is not known, the capital of the main factories is given in ( ), but not included in the total of capital.
8. Production value and wages are given in figures obtained by calculating in yen, and the exchange rate adopted is the average market price in 1931 for all currencies.
9. Figures for raw materials sometimes give only those for the principal raw materials, and in some cases give the total value of raw materials, thus they are not on the same basis.
10. Operating hours and days are the averages for the entire factories under the respective items.
11. In the table \* indicates estimated figures, — shows there is no figure obtainable, and ..... indicates figures are unknown. Other marks are explained whenever used.

Table 7  
FACTORY PRODUCTION VALUE CLASSIFIED BY THE NUMBER OF WORKMEN (1931)\*

Industry	Less than 10 workmen		10 to 30 workmen		30 to 100 workmen		Total
	Japanese (Yen)	Manchurian (Yen)	Japanese (Yen)	Manchurian (Yen)	Japanese (Yen)	Manchurian (Yen)	
Metal .....	171,380	237,550	303,680	111,499	684,890	13,648	10,029,593
Machinery & Utensils .....	43,436	76,089	516,603	60,486	1,077,708	156,534	42,680,538
Ceramic .....	39,934	20,511	172,052	90,366	432,041	39,588	5,236,679
Textile .....	41,908	135,770	162,952	1,271,855	220,342	1,506,021	19,092,986
Chemical .....	108,103	1,296,268	544,497	1,352,220	4,415,086	36,928,738	92,743,413
Comestible .....	2,179,615	676,509	2,106,973	495,003	2,606,981	1,295,970	43,320,063
Brewing .....	277,884	200,132	841,737	849,965	423,310	185,191	2,789,319
Miscellaneous .....	558,631	134,754	2,320,990	171,525	3,152,072	52,450	8,434,924
<b>Total</b> .....	<b>3,402,891</b>	<b>2,777,583</b>	<b>6,969,484</b>	<b>4,402,919</b>	<b>13,012,430</b>	<b>40,178,140</b>	<b>224,327,515</b>

Industry	More than 100		Unknown		Total	
	Japanese (Yen)	Manchurian (Yen)	Japanese (Yen)	Manchurian (Yen)	Japanese (Yen)	Manchurian (Yen)
Metal .....	8,486,226	—	—	20,720	9,646,176	38,3417
Machinery & Utensils .....	14,395,063	26,183,282	—	171,337	16,032,810	26,647,728
Ceramic .....	3,046,806	100,188	663,691	631,502	4,354,524	882,155
Textile .....	10,383,503	3,102,320	—	2,268,315	10,808,705	8,284,281
Chemical .....	21,464,847	10,632,066	132,000	15,869,588	26,664,533	66,078,880
Comestible .....	8,216,524	7,938,315	167,813	17,636,360	15,277,906	28,042,157
Brewing .....	—	—	—	11,100	1,542,931	1,246,388
Miscellaneous .....	1,982,712	—	—	61,790	8,014,405	420,519
<b>Total</b> .....	<b>67,975,681</b>	<b>47,956,171</b>	<b>963,504</b>	<b>36,670,712</b>	<b>92,341,990</b>	<b>131,985,525</b>

\* Refer to the notes given on page 362.

In the above table, the number of factories, excluding those producing subsidiary products, is 2,025, of which those suspending operation total 76. Classified by the branches of industry, the factories of the chemical industry are most numerous, as there are included oil extracting factories, and they take up 23% of the total number of factories. Then come those of the ceramic industry (22%), miscellaneous industry (13%), textile industry (12%), and comestible industry (10%).

Classifying the factories by the number of workmen employed, those having less than 10 workmen reach 29%, ten to 30 workmen 20%, 30 to 100 workmen 12%, more than 100 workmen 5%, and unknown 34%. Factories with more than 100 workmen are very few, and medium and small factories with less than 30 workmen are most numerous. Factories whose number of workmen is unknown may be considered as medium or small factories, and thus it may be assumed that the number of medium and small factories in Manchoukuo is much greater than the above table gives. Classified by the branches of industry, there are comparatively few small machinery factories, and in other branches and particularly in metal and ceramic factories, small ones are extremely numerous.

Classified by the nationality of the operators, Japanese factories are 538 against 1,487 Manchurian factories, and thus the Manchurian factories are much more numerous than the Japanese. But if the ceramic, textile and chemical factories are excluded, the Japanese number 375 against 503 Manchurian. In metal, machinery and comestible factories, the Japanese are comparatively smaller in number than the Manchurian. But in miscellaneous factories, the Japanese are more numerous than the Manchurian.

The annual production value of those factories is 224,327,515 yen, of which the production of chemical industry takes up 92,743,413 yen or 41% of the total. The comestible and machinery factories take 19% each, textile 9%, metal and miscellaneous factories 4% each, ceramic 2%, and brewing 1%. Main factory products are beancake and bean oil, 76,449,799 yen; wheat flour, 17,478,343 yen; iron goods, 8,910,129 yen. To give the average production per one factory of each branch of industry, it is: machinery and utensil industry, 231,959 yen; comestible, 228,000 yen; metal, 94,619 yen; textile 81,944 yen; miscellaneous, 32,194 yen; brewing, 23,840 yen; chemical 21,618 yen; and ceramic, 12,235 yen.

The production classified by factories according to the number of workmen shows that the production of factories having less than 10 workmen each reaches only 3% of the total production, factories with 10 to 30

workmen 5%, factories with 30 to 100 workmen 24%, factories with more than 100 workmen 51%, and factories with unknown numbers of workmen 17%. Thus the factories having 30 to 100 workmen and more than 100 workmen control more than 75% of the total production, but this tendency is further pronounced in the metal, and machinery and utensil factories.

The production classified by nationality of operators of factories shows that the production of Japanese factories is 92,341,990 yen against 131,985,525 yen of Manchurian factories. Thus the Manchurian factories control a greater portion of the total production. But when their productions are compared according to the branches of industry, it is seen that the productions of the Manchurian factories are larger than those of the Japanese only in the chemical industry (mainly oil extraction), comestible industry, and machinery industry (mostly the Mukden munition plant).

**Disadvantages of Manchurian Industry.**—The Kwantung Leased Territory is a free zone as far as the customs system is concerned, and there is no protection for native industries against competition with foreign products. Therefore, Japan and other foreign countries have often 'dumped' goods in the Kwantung Leased Territory in attempts to dispose of left-over stocks or to exploit a new market.

As the products made in the Kwantung Leased Territory for export to Japan are charged the same import customs duty as is collected on other foreign products at Japanese ports, exportation to Japan is difficult. But since 1925, some products of the Kwantung Leased Territory are permitted to be imported into Japan free of import duty according to a preferential customs regulation, but this measure is not sufficient to foster the development of industry in the Kwantung Leased Territory.

Moreover, under existing circumstances Manchurian industry has other operating disadvantages. For instance, the cost of fuel and power is high, banking facilities are not satisfactory, and on the whole in obtaining the supply of raw materials, the Kwantung Leased Territory is not situated in a better position than Japan proper.

The conditions in Manchuria outside the Kwantung Leased Territory were not much different from those in the Leased Territory as it had no customs autonomy up to 1930. Furthermore, as peace and order were not maintained, the disadvantages of industry were much greater than in the Kwantung Leased Territory. Thus the inactive condition of industry was more pronounced than in the Kwantung Leased Territory.

But since the establishment of Manchoukuo in 1932, the preservation of peace and order has remarkably progressed, and economic construction plans have also been gradually executed, and thus the condition has been greatly changed.

Respecting the import tariff, a partial reduction was effected in July, 1933, as the existing Import Tariff (National Import Tariff of China, adopted in 1931) succeeded to by Manchoukuo on March 1, 1932, was found to be of very strong anti-foreign nature, to hinder the progress of agriculture, mining and forestry, and also to injure the general public. As there are possibilities of the import tariff being further reduced in future, it may be believed that the conditions for the industry of Manchoukuo and particularly light industries have been made worse than before.

**Industrial Policy of Manchoukuo.**—The outline of the industrial policy of Manchoukuo may be generally learned from the general outline of the economic construction programme of Manchoukuo announced on March 1, 1933 (refer to Chapter IX). As was declared in the statement made by Manchoukuo, this merely set forth the fundamental policy. In the declared policy it is mentioned that, for the near future, separate plans may be drafted and announced. Economic construction is progressing satisfactorily of late as well as industrial control, to which the Manchoukuo Government attaches much importance.

At first, the fundamental policy of the general economic construction of Manchoukuo is to remove the evils of the former capitalism and to apply the Wangtao principle, the basis spirit of the new State, to economic facilities. The four basic policies mentioned in the general outline of the economic construction programme are as follow :

Firstly, the interests of the people as a whole will be made the keynote and efforts will be made to prevent any exclusive class of people from monopolizing the benefits of the exploitation of natural resources and the development of industries, and to enable all to enjoy such benefits.

Secondly, in order to develop all natural resources most effectively and to secure coordinated development of every branch of economy, national control will be exerted over important economic activities and measures for their rationalization devised.

Thirdly, in the work of unlocking resources and encouraging industries, the principle of the open door and equal opportunity will be observed. In the spirit of this principle, capital investments from various parts of the world will be invited, while appropriate and effectual use will be

made of the technical skill and experience and other essentials of civilization, taken from advanced nations.

Finally, with a view to harmonizing and rationalizing economic relations among Eastern Asiatic countries, and in view of the close economic inter-dependence between Japan and this country, emphasis will be placed upon securing cooperation between the two nations, and thereby rendering more intimate the relationship of mutual assistance.

The control of national economy is to be enforced to the following extent :

- (1) In principle, those enterprises which are important from the standpoint of national defence, or which are in the nature of public utility or public benefit will be conducted under official management by special companies.
- (2) Industries and resources not included within the above category will be left to the free management of private persons. Proper and necessary adjustment will be effected in the spheres of both production and consumption in order to promote national happiness and welfare, as well as to maintain the livelihood of the people.

Judging from the above two fundamental policies, the types of management of organs that undertake the economic construction of Manchoukuo are divided into :

- (1) Official management, public management or special companies.
- (2) Free private management more or less under State control.
- (3) Purely free management.

Whether by these three types of management the removal of the evils of capitalism and the healthy development of national economy as desired by the Manchoukuo Government can be effected or not depends upon future measures, and will be changed appropriately according to circumstances in future. However, as long as the above-mentioned two basic principles are not changed, it must be recognized that generally the above three types are to be followed.

Respecting the measures for industry, the three points of establishment of the basic and national defence industries, control of special industries, and rationalization of management and equipment are mentioned, though in abstract form.

They are as follow :

## Development of Mining and Manufacturing Industries

(1) *Policy*

The policy in regard to these industries will be designed to increase the wealth of this country by enriching the people's economy and increasing the national wealth through exploitation of mineral resources, and establishment of basic industries as well as those necessary for national defence.

(2) *Mining*

- a. By unifying the various coal mines and rationalizing production and supply of coal, efforts will be made to supply the public with ample quantity of the fuel at reduced prices, and also to augment its export.
- b. As a rule the mining rights of mineral resources essential for national defence must be held by special corporations so as to prevent reckless and uncontrolled mining operations, and facilitate the opening of new pits.
- c. Alluvial gold and gold mines will be classified into two, the one owned by the State and the other privately, the latter to be opened to public exploitation.

(3) *Manufacturing Industries*

- a. The undermentioned industries will be developed by degrees under necessary control according to domestic demands :
  - Metallic industry ;
  - Machine manufacture ;
  - Oil milling ;
  - Pulp industry ;
  - Soda manufacture ;
  - Alcohol manufacture ;
  - Tussah silk industry ;
  - Spinning industry ;
  - Flour milling ;
  - Cement manufacture ;
  - Brewing and distilling industry.
- b. Industries not included in the foregoing list will, for the time being, be permitted to develop freely, but, whenever necessity arises in the future, they may be properly controlled.
- c. Electrical industries will be placed under unified management in

order to provide the country with a sufficient supply of power at low cost.

(4) *Establishments*

- a. In order to stimulate healthy development of industries, and to secure the benefits of concentrated establishments, industrial districts will be established in the following places :
  - Mukden ;
  - Antung ;
  - Harbin ;
  - Vicinity of Kirin.
- b. Uniformity will be secured in grade and quality of industrial products.

At present the most important industry of Manchoukuo is agriculture, and therefore the fundamental economic construction declaration says, "Agriculture is the mainstay of our national economy. The objective of the increase of farm products lies in planning to become self-sufficient in those products which at present must be imported from abroad, as well as in striving to export in greater quantities agricultural produce in general and thereby secure a larger measure of happiness and benefit for the rural masses and elevate their standard of living," and emphasizes the necessity of protecting and encouraging agriculture. The policy for the manufacturing industry is included with the policy for the mining industry as above mentioned, and merely the establishment of basic industries and national defence industries is proposed. Respecting other general industries, control only is mentioned, and no other particulars are given. Regarding the customs policy which has the closest relation with general industries, it is only mentioned that "the tariff policy will be designed to promote foreign trade and international transactions," advocating free trade.

Judging from these conditions it will be seen that Manchoukuo positively protects and encourages basic industries and national defence industries, but respecting general industries (excepting industries specially fitting the territory as agricultural products industries) will not at present adopt any measure for rapidly fostering their progress, intending to develop them gradually upon the establishment of basic industries.

Secondly, regarding control of industries, the basic policy lists as industries to be developed under control the metal, machinery, oil and fat, pulp, alcohol, tussah silk, textile, flour, cement and brewing industries. These are not all the industries to be controlled, although it appears so

when only the portion of the basic policy relating to industry is viewed, and there will be no doubt about this point when the entire policy is studied. That is to say, important industries with the features of national defence or public welfare, such as the sulphuric ammonia, soda, electric, and gas industries are clearly to be understood as to be placed under proper control.

**Industrial Control.**—If the fundamental policy of economic control is to be followed, such industries are to be divided among those conducted under government management, public management or special companies, and others left to free private management under certain State control. Industries other than the above-mentioned are to be left to natural progress for the present, and may be given some control in future according to necessity, it is mentioned. Even the so-called free enterprises are thus to be placed under some control in order to avoid production surplus and unnecessary competition.

Concrete explanations respecting each branch of industry will be given here briefly :

A. Enterprises to be Operated by Government Management, Public Management or Special Companies—Industries to be conducted under this type of management are important industries possessing features of national defence or public welfare, but yet it is not clearly designated what kinds of industries are to be thus controlled. But basic industries, national defence industries, electric industry and such are naturally to be included in this category, and according to their nature, they will be put under government management, public management or special companies, it is believed.

**Iron and Steel Industry.**—Planning for the materialization of the system of producing iron and steel under one management, the Showa Steel Works was established at Anshan, upon the foundation of the existing equipment of the Anshan Iron Works. It is also proposed to amalgamate the Kungchang Iron Mining Company and the Penhsihu Colliery and Iron Works with the Showa Steel Works, in order to rationalize the iron industry of Manchoukuo.

**Liquid Fuel Industry.**—The oil shale industry at Fushun is already supplying quite a quantity of crude oil, but investigations are now being conducted with the object of using a portion of the crude oil production for producing volatile oil. According to the result of the study the greater part of the crude oil production might be used to make volatile oil, and then it may be necessary to expand the present plant. Researches and studies are now being made on these points.

**Aluminium Industry.**—Aluminium shale or hard clay is found abundantly at Fuchow, Chinchow, Yentai, Penhsihu and other parts of Manchoukuo. It is estimated that deposits having more than 42% content of aluminium total 77,000,000 metric tons and those above 50% reach 1,000,000 tons. The South Manchuria Railway Company decided to establish a chemical experimental plant at Fushun for conducting experiments on aluminium production by utilizing the surplus electric power available at Fushun. Establishment of the Japan-Manchurian Aluminium Company and the Manchuria Aluminium Company has been proposed. The Japan-Manchurian Aluminium Company is a private company aiming to establish its plant in Japan and to use materials produced at Fuchow and Yentai. The Manchuria Aluminium Company will be a company formed with the South Manchuria Railway Company as its central factor, and is planning to establish its plant at Fushun, depending on the result of the experiments at Fushun.

**Magnesium Industry.**—In the district around Tashihchiao, Manchoukuo, there is a vast deposit of excellent magnesite ore, which is estimated at tens of millions tons. A plan to produce metallic magnesium has been proposed, and shortly the Japan-Manchurian Magnesium Company with a capital of ¥7,000,000 (one half of the shares are to be owned by the South Manchuria Railway Company) is expected to be formed.

**Sulphuric Ammonia Industry.**—In consideration of the demand for sulphuric ammonia in Manchoukuo in the future, and for the supply of the demand in Japan and Manchoukuo and for export possibilities, the Manchuria Chemical Industry Company with a capital of ¥25,000,000 has been established. Its plant with the annual production capacity of 180,000 tons is now being constructed at Dairen.

**Soda Industry.**—As Manchoukuo possesses salt and electric power abundantly, various investigations are now being made for establishment of the soda industry.

**Ordnance Industry.**—For efficiently utilizing the equipment of the Mukden Ordnance works owned by the former military clique, the Mukden Ordnance works a limited company invested in by Japanese, was established in November, 1932, but the company is expected to be made into a Japanese-Manchurian joint enterprise in the future, and its capital will be increased according to future necessities.

**Explosive Industry.**—It is the policy of the Manchoukuo Government to keep the manufacture (by the Mukden Ordnance Works.), sales, and import of explosives in the hands of the Government, and make them a



Government enterprise. Consequently it has been decided to prohibit the manufacture of nitre which was formerly done by private persons.

*Electric Industry.*—The electric industry of Manchoukuo may be roughly classified into organizations conducted by Japanese, Manchurians and other nationals. In investment amount and volume of electricity generated, the Japanese enterprises stand foremost though not in the number of enterprises. The Japanese electric enterprises, and particularly those of the South Manchuria Railway Company and the South Manchuria Electricity Company, an affiliated company, possess the decidedly controlling power in the electric industry of Manchoukuo. Before the outbreak of the Manchurian incident, there was no control between the Japanese and Manchurian enterprises, they having been divided only according to administrative districts, and there were many regrettable points in the progress of the industries and the advancement of culture in Manchuria. But since the Manchurian incident, the conflict of interests of the Japanese and Manchurian electric enterprises has been much relieved, and the South Manchuria Electricity Company, which possesses absolute power in the electric field of Manchoukuo has been extending, since 1932, its control over the Yenchi Electric Company, Tunghwa Electric Company, Koshan Electric Company, and Hsifeng Electric Company, by either amalgamating them or putting them under joint management. Thus it appeared as if the electric industry of Manchoukuo would be controlled by the South Manchuria Electricity Company, but when the general outline of economic construction programme of Manchoukuo was announced, it was declared that the electric industry would be placed under controlled management, and power would be supplied at low prices abundantly, though no concrete plan for the controlled management was made public. It is, therefore, only clear that the electric industry is to be managed under control. It is reported, however, that for the control of the electric industry of Manchoukuo, the Kenkoku Electric Company, under joint Japanese and Manchurian management, with a capital of about ¥100,000,000, will be established, with its main office at Hsinking.

*Weights and Measures Industry.*—The existing system of weights and measures in Manchoukuo being not unified, the Manchoukuo Government adopted as a temporary measure a system of weights and measures based on the weights and measures generally used in the past, as the main system, and the metric system as a subsidiary system. The Government thus decided to propagate the use of the metric system and to adopt it as the only system of weights and measures in the future (Weights and Mea-

asures Law issued in January, 1934). Scales and measures are to be made a monopoly of the Manchoukuo Government, and the manufacture of simple scales and measures is to be entrusted to the Manchuria Weights and Measures Manufacturing Company, which is to be established with a capital of ¥1,500,000, and precision scales and measures are to be made by the Mukden Arsenal or makers recommended by the Japanese Government.

B. Private Free Management under Certain State Control—Industries in this category are those to be placed under required compulsory control according to the general outline of economic construction programme of Manchoukuo, excluding the above-mentioned enterprises to be of Government management, public management or special companies. Control of such industries will, of course, differ according to existing conditions. But at present the control includes the abolition or amalgamation of existing enterprises (control for encouragement and fostering), and a permit system for new enterprises (control in the sense of restricting competing enterprises), and others. Not much has yet been heard of control of sales, but it is expected that control of prices will eventually be adopted.

*Cotton Yarn and Fabric Industry.*—The production of cotton yarn and fabrics in Manchoukuo is about 70,000 bales of yarn and about 1,400,000 pieces of fabric, excluding the production of hand-weaving plants. Of this, about 60 per cent is produced by Japanese factories. Of imported cotton yarns and fabrics, about 60 per cent is Japanese products, and the remaining 40 per cent Chinese products. The majority of the Chinese products imported are produced by Japanese mills in China. Thus the Japanese interest in the textile industry of Manchoukuo is great and intimate. The production in Manchoukuo is given restriction control, and it has been decided not to open new mills that might cause unnecessary competition.

*Oil Refining Industry.*—Recently exploitation of great oil deposits in Jehol Province and in the vicinity of Manchouli, under the cooperation of Japanese and Manchoukuo capital, is being planned. The oil company established according to this scheme has a capital of ¥5,000,000, and the chief investors are Manchoukuo, South Manchuria Railway Company, Mitsui, Mitsubishi, Japan Oil Company, and Ogura Oil Company. The company is to engage in oil mining, refining, sales, and other activities. The main object of the company is to exploit oil deposits, but as considerable time will be required before oil is actually mined, it must obtain its supply of oil from abroad. According to the

present plan, the company will establish a refinery at Dairen, in order to supply refined oil throughout Manchoukuo, and also it expects to control the sale and price of petroleum in the country.

*Alcohol Industry.*—Alcohol may be regarded as very important as a war requirement according to a point of view, but at present Manchoukuo has not yet included it among the enterprises to be controlled by the Government, but hopes for its development, counting it as one of the enterprises to be undertaken by private companies under certain government control.

The alcohol industry which the Manchoukuo Government at present intends to control is the enterprises by Japanese or Manchurian capital, and those of Soviet capital appear not to be included among those to be controlled. But it seems that in the future a great trust will be formed by effecting cooperation even with the Soviet enterprises.

*Cement Industry.*—The cement consumption in Manchoukuo is recently showing, on the whole, an annual increase, although the demand differs more or less according to year. Formerly the demand was supplied by the Onoda Cement Works (Japanese capital) at Chousuitzu, Dairen. With the sudden activity of various construction works in Manchoukuo since the establishment of the new State, the demand for cement has greatly increased. As the cement making materials, limestone and clay, are abundantly found in Manchoukuo, Japanese cement makers are considering the establishment of cement mills in the country.

Among these cement mill projects are the Fushun cement mill of the South Manchuria Railway Company, the Anshan cement mill of the Onoda Cement Company, the Daido Cement Company under Japanese and Manchurian joint management (Kirin), and the Manchuria Cement Company of Japanese capital. The annual production capacity of these four proposed mills would total about 400,000 tons, and with the capacity of 200,000 tons of the existing Chousuitzu mill at Dairen, the total would reach 600,000 tons, sufficient to meet the entire demand of Manchoukuo. Therefore, the Manchoukuo Government is intending not to permit the establishment of new cement mills other than the four proposed.

*Pulp Industry.*—It was expected that with the establishment of peace and order in Manchoukuo, Japanese paper manufacturers would extend their activity to the territory. Recently the Oji Paper Company of Japan conducted various investigations with the aim of opening a branch mill in Manchoukuo, and urged the Kyoyei-kigyo Company (Japanese capital ¥5,000,000) of Manchoukuo to immediately undertake the manufacture of

building materials and pulp, in the Kirin Tunghwa district. On the other hand, the establishment of the Manchuria-Mongolia Chemical Fibre Industry Company under Japanese-Manchurian joint management was proposed. With the strong support of Manchoukuo, the company was established within 1933 and has commenced operations in 1934, with a capital of ¥5,000,000 (80% Japanese 20% Manchurian). This company is to manufacture pulp only at first and supply them to Japanese paper companies. The pulp industry is expected to have certain State control, and consequently it is believed that the competition among the branch mill of the Oji Paper Company, the Kyoyei-kigyo Company, and the above-mentioned Chemical Fibre Industry Company will be controlled.

C. Purely Private Free Enterprises.—These enterprises will not have any State control whatever, and their management is left free to private businessmen. Consequently such enterprises will naturally be those not occupying very important positions, and their scale will be comparatively small. But it is a necessary development of the modern industrial system that small and medium enterprises appear following the progress of comparatively large enterprises. There is believed to be quite enough room for the existence of private free enterprises in Manchoukuo in future, with the advancement of the living conditions of the people.

Such enterprises may be placed under State control according to the economic necessities of the people, but until such time comes, they will be left to free management entirely.

Next, respecting the industrial facilities mentioned in the basic policy, the establishment of industrial districts and standardization of industrial products will be explained.

*Industrial Districts.*—The basic policy says that for the stimulation of the healthy progress of industry and for the benefit of concentrating industrial facilities, the following are designated as industrial districts: Mukden, Antung, Harbin, and the neighbourhood of Kirin.

Mukden, Antung, and Harbin already were the centres of Manchurian industry before the outbreak of the Manchurian incident, and thus there is no need of explaining their designation. To view how the neighbourhood of Mukden is favoured as an industrial district and especially for heavy industries, its advantages are, firstly, that it includes the iron mines of Anshan and Kungchang, and the coal deposits of Fushun, Penhsihu and Yentai; secondly, the district extends along both sides of the South Manchuria Railway main line and the Antung-Mukden line, connects with

Kirin by the Mukden-Chaoyangchen and Kirin-Chaoyangchen Railways, and reaches the Hsinchiu coal mine district by the Mukden-Shanhaikwan Railway; thirdly, with the completion of the new railway network, it connects with the Sea of Japan via the port of Rashin, and thus there would be no inconvenience even if utilization of the Gulf of Pechili were impossible; fourthly, the electric supply is sufficient today with the volume produced at the Fushun Generating Station, and even when a further expansion is necessary it will be advantageous to utilize the present equipment; and fifthly, it has a convenient water supply.

Thus the neighbourhood of Mukden has the best conditions as the industrial district of Manchoukuo, sufficient reason why the Mukden district is made one of the industrial districts of Manchoukuo by the basic policy. In this territory, the Daito section, (大東區) the section east of the Ordnance Works, and the Tessei industrial district, have been designated as industrial districts. Of these districts, the Tessei industrial district forms the central area, because of the water supply and transportation facilities. In this section has been established the Mukden Industrial Land Company (奉天工業土地會社) under joint Japanese-Manchurian management (investment by Manchoukuo ¥1,000,000; investment by the South Manchuria Railway Company ¥1,500,000). The land owned by the company covers 300 hectares, and the area leased to Japanese capitalists in Japan and businessmen in Manchoukuo totalled 82.65 hectares in July, 1933.

Industry	Number of leases	Area (hectare)
Casting.....	4	1.43
Metal .....	4	3.41
Ceramic .....	1	0.32
Chemical .....	4	7.93
Soap and toilet goods .....	4	3.80
Rubber shoes and rubber-soled tabi .....	2	5.95
Leather .....	3	2.55
Lumber .....	3	6.28
Comestible .....	6	37.49
Others .....	7	10.25
Total .....	38	79.42

The Kirin neighbourhood also was made an industrial district, as it will become an important industrial territory in North Manchuria with the opening of the Hsinking-Tumen and Lafa-Harbin Railways.

**Standardization of Industrial Goods**—The standardization of various industrial goods is an urgent problem. For this object, adopting the policy of following the Japanese standards, the Manchoukuo Government decided to establish a committee on this question in the Department of Industry and to cooperate with the Standardization Committee of Japan.

### Textile Industry

The principal resources of Manchoukuo as viewed from the standpoint of the textile industry are wool, cotton, tussah silk, jute, flax, hemp, goat wool, and others.

The number of sheep kept in Manchoukuo is 4,000,000 and the wool production is said to be about 4,000 metric tons a year at present. But with the future improvement of the sheep production can be increased to 13,000 tons, it is predicted.

The native variety of cotton is now being cultivated in the district between Tashihchiao (大石橋) and Liaoyang (遼陽) on the South Manchuria Railway line, and at Chinchow hsien (錦州縣), Chihsi hsien (錦西縣), and Heishan hsien (黑山縣) along the Mukden-Shanhaikwan Railway line. But the majority of the cotton production in the country is used for stuffing, and only a small portion is used as spinning material. That is to say, the total cotton production is 15,000 metric tons, but only about 3,000 tons are used for spinning purposes, and the rest is the stuffing cotton. Manchoukuo is annually importing 12,000 metric tons of foreign cotton for spinning purposes to fill the shortage of supply. Manchoukuo is now trying to distribute the seeds of Korean cotton and encourage its cultivation; in the fiscal year of 1933, 90,000 Manchoukuo yuan was included in the budget for this purpose. The plan aims at cultivating cotton on 250,000 to 300,000 hectares of land and obtain a cotton production of 90,000 tons.

Tussah silk cocoons are produced in various districts along the Antung-Mukden Railway, and the total production is about 8,000,000,000 cocoons in a year (about 200,000 baskets or 1,800 tons), valued at ¥25,000,000. The annual export of tussah silk yarn is more than ¥10,000,000, being mostly shipped to Japan; waste silk and cocoons are mostly shipped to Europe and America.

The annual production of hemp is 9,600 metric tons, and that of jute is 14,000 to 15,000 tons, but both are mostly used for the needs of farmers. The demand for gunny bags for packing the soya beans being very large,

90 per cent of the 50,000,000 gunny bags annually used is imported. For making gunny bags, about 1,200 tons of Indian jute, and 60 tons of Chinese jute are annually imported. For the cultivation of flax North Manchurian districts are regarded as promising, Imenpo (一面坡), Hailin (海林), Kirin, and Tunghwa districts being considered most promising. The production of flax is expected to become large in future.

Manchoukuo produces much goat wool. Formerly this was exported to England in the crude form, and after finishing was again brought to the Orient. But recently with the progress of the wool industry in Japan, where bristles are removed by the carding process, it is now sold as "cashmere" or "camel's hair."

The cotton spinning industry of Manchoukuo has about 150,000 spindles, and the important spinning mills are the Naigai Spinning Mills (内外棉) and the Manshu Fukubo Mill (滿洲福紡) in the Kwantung Leased Territory, the Manshu Spinning Mills (滿洲紡績) at Liaoyang, and the Mukden Spinning Mills (奉天紡紗廠) at Mukden. The total production is 90,000 to 100,000 bales; the imported cotton yarn reaches 70,000 bales, and imported cotton fabrics 80,000 bales annually.

In the wool industry, there are the Manchuria-Mongolia Wool Weaving Company, and the Yuhua Wool Weaving Mills (祐華毛織工廠) at Mukden, and the Yuchingte Wool Weaving Mills (祐慶德毛織工廠) at Harbin. The production at these mills totals 900,000 yards of woolen fabrics, 110 tons of worsted yarn, and 105 tons of carpets and felt, totally valued at 1,500,000 yen. On the other hand, the import of woolen fabrics reaches annually 5,000,000 to 6,000,000 yen; thus the majority of the Manchurian needs is supplied by imports. Consequently Manchoukuo is regarded as a promising field for the woolen industry, and particularly in the neighbourhood of Harbin the demand for woolen goods is large.

In the gunny bag industry, there are the Mukden Jute Company at Mukden, and the Manchuria Jute Company at Dairen. The total equipment of these companies is 5,000 spindles and 300 power looms. At present the Mukden Jute Company is suspending operations, and only the Manchuria Jute Company is operating, producing annually 2,910,000 gunny bags valued at 1,200,000 yen. But the production is not sufficient to fill ten per cent of the total demand in Manchoukuo.

The pongee weaving industry has recently much developed in the district surrounding Antung, the central market of tussah silk. At present there are 17 mills at Antung, 5 at Kaiping (蓋平), 3 at Haicheng (海城), and 1 at Mukden, a total of 26 mills. The total production is about 140,-

000 pieces in a year. A spinning enterprise using the waste cocoons of tussah silk is the Antung branch of the Fuji Gas Spinning Company. This company formerly planned to develop the industry by amalgamating with the mills of the Japanese-Chinese Pongee Company at Antunghsien and also by expanding its own mills, but received quite a blow on account of the oppression of foreign goods in India since 1931, and the development of rayon yarns and silk yarns. Yet as material for making coarse silk cloth, tussah silk has still good prospects.

The textile industry of Manchoukuo may be divided into the factory industry and household industry. All the factory industry establishments were established and are operated by Japanese, excepting only the Mukden Spinning and Weaving Mills and the Chunisaochih-kungssu (純益綢織公司), which are operated by Manchurians. Almost all these mills were planned or established during the financial boom period during the latter part of the Great War. Household industry establishments are all operated by Manchurians and their history is old; they are quite numerous, but their scale is small.

The number of spinning mills, production, and foreign trade amounts of goods connected with the spinning and weaving industry are as shown in the following Tables 8 and 9 (excluding household industry).

Table 8  
SPINNING AND WEAVING INDUSTRY (1931)\*

	Number of Mills		Total	Capital		Total (Mixed)
	Japanese	Manchurian		Japanese (Yen)	Manchurian (Mixed)	
Cotton Yarn and Fabric .....	4	76	80	5,877,700	4,965,900	10,843,600
Tussah Silk Yarn .....	2	56	58	250,000	800,500	1,050,500
Hemp .....	1(1)	—	1(1)	1,200,000	—	1,200,000
Woolen Fabric .....	2	13	15	1,965,000	21,400	1,986,400
Knitting Wool .....	2	30(2)	32(2)	31,000	43,755	74,755
Cotton Refining .....	4	6	10	172,872	8,000	180,872
Dyeing.....	2	35	37	20,000	64,290	84,290
<b>Total .....</b>	<b>17(1)</b>	<b>216(2)</b>	<b>233(3)</b>	<b>9,516,572</b>	<b>5,903,845</b>	<b>15,420,417</b>

	Total Number of Day-workmen (in a year)		Total (Yen)	Production		Total (Yen)
	Japanese	Manchurian		Japanese (Yen)	Manchurian (Yen)	
Cotton Yarn and Fabric .....	1,378,980	835,024	2,214,004	8,240,882	4,938,399	13,179,281
Tussah Silk Yarn .....	62,296	435,930	498,226	414,532	3,014,497	3,429,029
Hemp .....	259,111	—	259,111	838,284	—	838,284
Woolen Fabric .....	109,998	14,100	124,098	911,714	13,570	925,284
Knitting Wool .....	25,035	66,487	91,522	16,011	100,748	116,759
Cotton Refining .....	26,704	41,080	67,784	239,932	110,799	350,731
Dyeing.....	17,641	67,736	85,377	147,350	106,268	253,618
<b>Total .....</b>	<b>1,879,765</b>	<b>1,460,357</b>	<b>3,340,122</b>	<b>10,808,705</b>	<b>8,284,281</b>	<b>19,092,986</b>

\* Refer to the notes on page 362.

Table 9  
FOREIGN TRADE IN GOODS CONNECTED WITH SPINNING AND WEAVING INDUSTRY

(in Haikwan taels)

	1930	1931
<b>Imports :</b>		
Yarn, Thread, Twine, Cordage and Materials thereof...	24,066,171	23,337,856
Cotton .....	8,301,882	10,296,337
Cotton Yarn .....	10,949,387	8,834,606
Others .....	4,814,902	4,206,913
Tissues and Manufactures thereof .....	78,396,405	54,331,026
Tissues of Cotton .....	54,388,636	29,992,786
Tissues of Silk.....	4,822,143	2,354,032
Tissues of Wool .....	5,669,488	3,115,005
Other Tissues .....	843,268	1,051,847
Gunny Bags.....	10,086,800	15,855,220
Other Manufactures of Tissues .....	2,586,070	1,962,136
Clothes and Accessories thereof .....	5,712,625	5,470,823
Total .....	108,175,201	83,139,705
<b>Exports :</b>		
Yarn, Thread, Twine, Cordage and Materials thereof...	18,331,671	23,882,226
Raw Silk (wild) .....	9,226,302	11,903,130
Cotton Yarn .....	5,908,683	7,992,091
Wool (sheep) .....	788,483	909,830
Others .....	2,408,203	3,077,175
Tissues and Manufactures thereof .....	4,888,591	3,874,936
Clothes and Accessories thereof .....	222,205	209,085
Total .....	23,442,467	27,966,247
<b>Balance (import surplus) .....</b>	<b>84,732,734</b>	<b>55,173,458</b>

The primitive condition of the textile industry of Manchoukuo may be learned from the large amount of imports. In recent years there is annually a total import of about 100,000,000 Haikwan taels, and of this total, the import of cotton yarn and fabric takes up about 70,000,000 to 80,000,000 Haikwan taels. Manchoukuo's advantage in the textile industry is the low wage cost, but in respect of banking facilities, power cost, taxes, fuel cost, and raw materials, the country is in a disadvantageous position, particularly compared with Japan. Also the fact that quite high import duties are levied upon raw materials is another obstacle to this industry in Manchoukuo.

**Cotton Yarn and Fabric Industry**—Manchoukuo possessing a cotton producing district lying between 38° and 43°N. Lat. it would appear that the country is not favourable for cotton cultivation, compared with the United

States which has its economic cotton cultivation area around 37°N. Lat. But the main cotton producing districts of Manchoukuo are between Tashihchiao and Liaoyang on the South Manchuria Railway line, and Chinchow, Chihsi, Peichen, and Heishan hsien along the Mukden-Shanhaikwan Railway which are located at 40° to 41° N. Lat.

The total cotton cultivation area in Manchoukuo is 38,000 hectares, and the annual production is estimated at 15,000 metric tons. In the district south of Mukden between the South Manchuria Railway line and the Liao River, and the Mukden-Shanhaikwan Railway district, is produced 12,000 metric tons of cotton; north of Mukden, the Fakumen (法庫門) district, 50 kilometres west of Tiehling, produces 300 tons; and cotton production for farmers' own consumption in other districts reaches 2,700 tons, it is estimated.

The above-mentioned production is insufficient to meet the demand in Manchoukuo, and annually 12,000 to 13,000 tons of Chinese, Indian, and American cotton are imported for spinning. Of the total cotton production in Manchoukuo, the portion used for spinning purposes is small, the majority being used for stuffing purposes by farmers, as already explained.

The cotton production and imports are given in the following Tables 10 and 11.

Table 10

## IMPORTS OF COTTON

Years	Quantity (metric tons)	Value (Hk. Tls.)
1929 .....	13,094	7,275,285
1930 .....	13,430	8,301,882
1931 .....	16,916	10,296,337
China .....	4,134	2,661,694
U.S.A. ....	3,037	1,750,267
British India .....	497	207,298
Japan .....	9,227	5,668,149
Others .....	21	8,929

Table 11  
COTTON REFINING (1931)\*

	Number of Factories	Capital	Production Quantity (metric tons)			Value (Yen)
			Cotton seed	Cotton ginned	Cotton refined	
<b>Japanese:</b>						
Dairen	3	(Gold) 154,872	208	110	254	207,131
Chinchow	1	( " ) 18,000	—	—	52	32,801
Total	4	( " ) 172,872	208	110	306	239,932
<b>Manchurian:</b>						
Ssuping kai	5	(Tayang) 8,000	—	—	245	94,829
Kuo-chiatien	1	—	—	—	23	15,970
Total	6	( " ) 8,000	—	—	268	110,799
<b>Grand Total 10</b>		<b>(Mixed) 180,872</b>	<b>208</b>	<b>110</b>	<b>574</b>	<b>350,731</b>

A plan of increasing the cotton production in Manchoukuo is now being carried out. The Cotton Cultivation Company of joint Japanese-Manchurian management with a capital of ¥1,000,000 (¥500,000 paid-up) was established in 1933. In order to increase the cotton production, it is necessary to set aside some portions of the present cultivated area for the cultivation of cotton. As cotton prefers dry soil, products to be replaced by cotton will be soya beans, millet and kaoliang. The total soya bean cultivation area in Fengtien Province is 350,000 hectares, and if 250,000 to 300,000 hectares out of this area are planted with cotton, the cotton production obtained will be about 90,000 tons. But to reach such results will take considerable time.

The native variety of cotton produced in Manchoukuo is very convenient for the ginning process as the seeds are separated very easily. The ginning percentage averages 25%, inferior to the 35% of American cotton. The fibre of the black variety measures 23 to 26 millimetres; it is elastic, fine, and has good tension, possessing also good lustre. Recently tests were made at the Manchuria Spinning Company at Liaoyang, and the Mukden Spinning and Weaving Mills in spinning native cotton, and it has been proved that, using native cotton exclusively, yarns up to 30 count can be produced.

That is to say, Manchurian native cotton is suitable for spinning yarns from 20 s to 30 s, but its ginning percentage is low, being only about 25%, or 10% lower than the 35% of American cotton. In this respect the Manchurian cotton has much disadvantage. But by selecting and produc-

\* Refer to the notes on page 362.

ing varieties that have larger percentage of harvest and ginning, the native species may be gradually improved. The early growing American species has the advantage of greater harvest and ginning percentages, but it is very sensitive to the effect of climate. On the other hand, the native species is suitable for the climatic conditions of Manchoukuo and also possesses the previously mentioned good qualities; furthermore it is more profitable than other agricultural products. Because of these conditions, the following three points can be proposed as the cotton cultivation policy of Manchoukuo:

(a) Native cotton varieties and especially the species with red stalk and black seeds are mainly to be cultivated.

(b) In the southern half of the Liaotung peninsula, the cultivation of the U. S. upland early growing species is to be encouraged.

(c) To increase the utilization value of the native cotton for spinning medium sized yarns.

It was only about 1921 that cotton spinning and weaving first appeared in Manchuria in a modern form. In the first two or three years various enterprises were promoted, and many mills were erected. Most of them are now in difficulties, and only the Mukden Spinning and Weaving Mill (奉天紡紗廠), a Manchurian enterprise, the Manchuria Spinning Company, the Naigai Cotton Spinning Company, and the Manshu Fukubo Spinning Company (these three companies are Japanese enterprises) are operating though their business returns are not-satisfactory.

Important spinning mills in Manchoukuo are as follow:

Company	Registered Capital	Paid-up Capital	Spindles
Manshu Fukubo Spinning Co. ....	Yen 3,000,000	1,500,000	21,120
Naigai Cotton Spinning Co. Chinchow			
Branch .....	" 4,500,000	4,500,000	63,200
Manchuria Spinning Co.....	" 2,500,000	2,125,000	31,160
Mukden Spinning and Weaving Mill..	Yuan 4,500,000	4,171,500	30,860
Yingkow Spinning and Weaving Mill.	" 2,000,000	500,000	5,000
Liaoning Tunghsing Spinning and Weaving Mill.....	" 500,000	500,000	—
Total.....	Yen 10,000,000	8,125,000	151,340
	Yuan 7,000,000	5,171,500	(spindles now being operated) 146,340

Various causes for the undeveloped condition of the spinning and weaving industry include the close proximity of Japan, which is a great producer of cotton yarn and piece-goods; the limited and non-elastic

market; the high fuel and power cost; the inability to utilize Manchurian cotton except in Manchurian mills; and the low import duty.

With the establishment of the new Government of Manchoukuo, it is to be expected that the oppression and high taxation imposed by the former régime will be moderated. As the free utilization of Manchurian cotton, which is produced in increasing quantities year by year, becomes possible, the industry is expected to make fair progress when efforts are directed to the cultivation of cotton and the advancement of spinning and weaving technique, and also when the industry is favoured with more capital.

The capital invested and production of the spinning industry of Manchoukuo are as follow:

Table 12  
COTTON SPINNING AND WEAVING INDUSTRY (1931)\*

	Number of Factories	Capital	Production Quantity		Value (Yen)
			Yarn (bales)	Cloth (pieces)	
<b>Japanese:</b>					
Dairen	1	(Gold) 1,500,000	15,342	—	1,824,886
Chinchow	1	(,,) 2,500,000	19,658	—	3,274,000
Liaoyang	1	(,,) 1,875,000	20,264	196,713	3,122,794
Fushun	1	(,,) 2,700	—	15,908	19,202
Total	4	(Gold) 5,877,700	55,265	212,621	8,240,882
<b>Manchurian:</b>					
Port Arthur	1	(Gold) 3,200	—	5,100	6,630
Dairen	1	(,,) 3,000	—	6,978	6,629
Chinchow	17	(Tayang) 51,000	—	154,552	121,864
Kaiping	5	(,,) 5,500	—	8,500	15,640
Tashihchiao	1	(,,) 3,000	—	3,200	5,520
Liaoyang	4	(,,) 17,500	—	13,000	59,248
Mukden	3	(Hsienyang) 4,471,900	19,000	371,000	2,509,300
Fushun	2	(Gold) 20,000	—	30,548	48,105
Tiehling	2	(,,) 3,500	—	7,654	11,286
Hsinking	6	(Harbinyang) 15,000	—	65,561	170,292
		(Hsienyang) 53,000	—	—	—
		(Gold) 4,000	—	—	—
Yingkow	22	(Tayang) 230,000	—	401,300	1,825,915
Kirin	4	(Kirinyang) 28,000	—	—	—
		(Manchoukuo yuan) 42,000	—	100,400	134,750
Chengchiatun	8	(Tayang) 15,300	—	12,900	23,220
Total	76	(Mixed) 4,965,900	19,000	1,180,693	4,938,399
<b>Grand Total</b>	<b>80</b>	<b>(Mixed) 10,843,600</b>	<b>74,265</b>	<b>1,393,314</b>	<b>13,179,281</b>

\* (1) Refer to the notes given on page 362.

(2) Manchurian factories of small scale are excluded.

Next the hand weaving industry of Manchoukuo will be briefly explained.

The hand weaving industry has existed in Manchuria from a very early time, but formerly there was no cotton weaving industry to speak of. The Sino-Japanese controversy of 1915 suddenly stimulated the development of cotton weaving. The loud cry for encouraging native industries and for the rejection of Japanese products raised in connection with the above-mentioned controversy, stimulated the production of so-called 'patriotic goods,' or piece-goods of native production. Equipment is still primitive, mostly wooden hand-loom, but there is a fairly large demand for these native products as the production cost is low and the quality is strong though coarse.

As hand-loom are scattered all over Manchoukuo, it is impossible to ascertain the total output. The result of the investigation made by the South Manchuria Railway Company in Mukden, Harbin, Tieling, Hsinking and other such centres, where cotton weaving is conducted on a comparatively large scale, is as follows:

## HAND WEAVING IN MANCHURIA

	Number of Factories	Number of Looms	Production (Pieces)
Yingkow .....	27	1,098	180,000
Antung .....	42	180	26,836
Mukden .....	174	3,300	1,000,000
Tieling .....	253	1,107	332,460
Harbin .....	36	?	830,000
Hsinking .....	260	1,400	250,000
<b>Total</b> .....	<b>792</b>	<b>7,085</b>	<b>2,619,296</b>

The total consumption of cotton yarn and fabric in Manchoukuo is about 250,000 bales in a year, and not only it is a great consumption market for these goods at present, but also it is expected that the consumption will immensely increase in future with the increase of population and the progress of civilization and culture. But as already mentioned the production in the country at present is small, and the majority of the supply is obtained from China and Japan. The cotton yarn annually imported into Manchoukuo is about 70,000 bales, and the cotton fabric is about 80,000 to 90,000 bales; Japan is supplying 44% of the import, and China 55%. Until a few years ago the import from Japan was far greater than that from China, but in recent years the import from Shanghai and Tsingtao has rapidly increased due to the development of

the cotton spinning industry in the central and northern parts of China. Of course, it must be remembered that the majority of the import from China is the product of Japanese spinning mills established in China.

The supply, consumption, import, and export of cotton yarn and fabric in recent three years are as shown in the following Tables 13 and 14:

Table 13  
SUPPLY AND CONSUMPTION OF COTTON YARNS AND FABRICS\*

	1929		1930		1931	
	Cotton yarn (bales)	Hand- woven cloth (bales)	Cotton yarn (bales)	Cotton piece goods (pieces)	Cotton yarn (bales)	Hand- woven cloth (bales)
Imports through Three Ports ...	75,551	10,175,850	66,739	8,091,502	48,139	3,093,314
Production of Mills in Manchou- kuo .....	51,140	267,520	—	57,146	68,461	277,045
Exports through Three Ports ...	19,928	14,640	15	27,304	36,856	44
<b>Balance Consumption</b> .....	<b>106,763</b>	<b>10,428,730</b>	<b>66,724</b>	<b>8,354,335</b>	<b>79,744</b>	<b>3,370,315</b>
						<b>46,778</b>

Table 14

IMPORTS OF COTTON GOODS (1931)\*\*  
(in Haikwan taels)

	Japan	China	Others	Total
Cotton Goods .....	13,327,592	15,759,259	905,935	29,992,786
Cotton Thread .....	53,929	133,333	245,468	432,730
Cotton Yarn .....	1,198,004	7,635,128	1,474	8,834,606

\* The three ports are Antung, Dairen, and Yingkow. The production of mills in Manchoukuo is the total of the productions of the Manshu Spinning Company, Naigai Cotton Spinning Company, and Mukden Spinning and Weaving Mill.

\*\* In the above table the term 'Chinese goods' does not mean products of mills operated by Chinese, but goods produced in China. Although exact information cannot be obtained, the greater portion of the products imported into Manchoukuo may be regarded as the products of Japanese factories in Shanghai and Tsingtao, as most of the importation comes from Shanghai and Tsingtao.



In order to effect the self-supply of the 70,000 bales of cotton yarn now being imported, it is necessary to install about 100,000 more spindles in Manchoukuo. When the cotton fabric imported from Shanghai and Tsingtao is calculated in yarn, another 100,000 spindles would be required to make Manchoukuo able to supply her own needs. Thus, in all, it would be necessary to install 200,000 more spindles to make the country self-supplying in cotton requirements.

**Tussah Silk Filature.**—The origin of the tussah silk culture in Manchuria is quite old, but it was only about fifty years ago that there had been the prospect of the development of the industry.

Soon after the close of the Russo-Japanese War, the attention of the Japanese was directed to the tussah silk filature and weaving, and not only did some Japanese establish filatures and weaving plants, but they also attempted to export their products. But they were unable to achieve success. After the outbreak of the Great War, many silk weavers in Japan engaged in producing pongee silk, as the production of silk fabrics in Europe decreased while the demand for pongee increased. Stimulated by these activities of the Japanese weavers, the tussah silk industry of Manchuria made remarkable progress, and the export of tussah silk yarn rapidly rose.

At present the tussah silk cocoon production reaches an average of 8,000 million cocoons per year, and the export of tussah silk, reaching more than ten million Haikwan taels in value annually, occupies an important place in the export trade of Manchoukuo, coming after only beans, bean products, and coal. The pongee weavers of Japan mostly depend upon the supply of tussah silk yarn from Manchoukuo, and weaving Manchurian tussah yarn into pongee, they export it as Japanese pongee.

Table 15

EXPORTS OF COCOONS, TUSSAH SILK YARN AND SILK GOODS,  
ETC., AT THE THREE SOUTH MANCHURIAN PORTS

(Dairen, Antung and Yingkow)

(in 1,000 Haikwan taels)

	Cocoons		Tussah Silk Yarn		Waste Silk Yarn		Silk Goods Value	Total Value
	Quantity Metric Tons	Value	Quantity Metric Tons	Value	Quantity Metric Tons	Value		
1921 ...	6,097	2,251	1,689	13,077	—	813	73	16,214
1922 ...	7,490	3,787	1,105	11,242	660	848	41	15,918
1923 ...	4,255	2,349	1,606	15,539	1,312	1,701	84	19,673

	Cocoons		Tussah Silk Yarn		Waste Silk Yarn		Silk Goods Value	Total Value
	Quantity Metric Tons	Value	Quantity Metric Tons	Value	Quantity Metric Tons	Value		
1924 ...	3,180	1,261	1,052	8,332	1,001	673	108	10,374
1925 ...	4,753	1,199	1,827	11,380	2,181	1,029	358	13,966
1926 ...	2,440	893	1,500	10,494	1,334	1,028	533	12,948
1927 ...	1,627	708	1,354	10,256	1,094	1,192	423	12,579
1928 ...	2,258	616	1,499	8,586	1,425	1,372	702	11,276
1929 ...	1,467	368	1,616	9,097	1,031	1,085	1,016	11,566
1930 ...	1,710	538	1,549	9,184	811	926	672	11,320
1931 ...	2,282	523	2,131	11,784	1,252	987	745	14,039

Tussah silk filatures in Manchuria may be divided into two classes by the size of their equipment. The first class includes those having fair sized mills, producing silk yarn on a large scale by employing a large number of men and women; though they cannot be called a machine industry, they are included in factory industry. The second includes the tussah silk reeling done by farmers as side-work, following the old-fashioned methods and producing on a very small scale, which is still in the primitive stage of household industry. In the general process of industrial development, the second class is now being greatly oppressed by the first class, and has no prospect of future development.

The tussah silk filatures exist all over Manchoukuo, but little information can be obtained respecting the old-fashioned household plants. On the other hand, filatures operated as a factory industry are established in the cities or towns which are the markets of tussah cocoons, and their conditions can be learned to some extent. The total production is unknown, but calculating from the amount exported and also the conditions in producing districts, it is estimated at 1,800 metric tons (8,000 million cocoons) per year recently.

The present conditions at the principal filature centres are shown in Table 16, but no information is available for Hsiuyen, Fenghuangcheng and Hsianhsien.

Table 16  
TUSSAH SILK FILATURE AND SPINNING INDUSTRY (1931)\*

	Number of Factories	Capital	Production				Value (Yen)
			Quantity	Value			
			Silk (kg.)	Waste Silk (kg.)	Spun Silk (kg.)	Pongee (pieces)	
<b>Japanese:</b>			16,611	—	—	1,694	182,768
Port Arthur	1	250,000	—	—	—	—	231,764
Antung	1	(45,500,000)	—	—	103,826	—	414,532
Total	2	250,000	16,611	—	103,826	1,694	82,000
<b>Manchurian:</b>			21,000	—	—	—	56,000
Sungshu	2	1,200	—	—	—	—	60,000
Wangchialing	2	10,000	12,000	—	—	—	92,920
Hsukotun	1	20,000	15,000	—	—	—	73,600
Kaiping	5	19,000	10,500	—	—	24,000	381,662
Haicheng	3	13,000	2,400	—	—	20,640	2,268,315
Mukden	1	500,000	83,400	—	—	4,780	3,014,497
Antung	42	199,000	441,420	286,159	—	—	3,429,029
Total	56	800,500	585,720	286,159	—	49,420	—
<b>Grand Total</b>	<b>58</b>	<b>1,050,500</b>	<b>602,331</b>	<b>286,159</b>	<b>103,826</b>	<b>51,114</b>	<b>3,429,029</b>

\* (1) Refer to the notes given on page 362.

(2) In the above table it is difficult to give the general condition of the tussah silk industry of Manchoukuo, as investigations are imperfect excepting at Antung. The above table, therefore, does not include the figures for the household or subsidiary filatures and mills that have been always operated in the country, but also does not give those for the entire factory system mills. Therefore, the following figures given as the conditions of the principal filatures as standing at the end of 1929 are to be examined as reference materials, but these statistics also do not contain figures for Hsiuyehhsien (榆樹縣), Fengchenghsien (鳳城縣), Hsianhsien (西安縣), etc.

Districts	Factories	Reeling Machines	Daily Capacity (kg.)	Tussah Silk Production		Waste Silk Production	
				(kg.)	(Yen)	(kg.)	(Yen)
Kaiping	14	3,060	58,538	611,020	33,480	44,640	
Haicheng	12	6,090	363,143	2,231,975	207,540	223,036	
Antung	51	11,920	375,533	3,075,061	318,000	770,814	
Hsifeng	44	4,145	82,583	708,430	66,059	71,813	

(3) Respecting the production of pongee the above table gives only a part. In 1930, pongee weaving plants at Antung numbered 17, capital 121,200 yuan, weaving machines 186, and production 63,400 pieces. At Kaiping there were 5 plants, machinery 200; at Haicheng 3 plants with 100 machines.

Reeling silk from tussah cocoons furnishes various by-products. The first of such by-products is waste-silk which is mostly exported to Shanghai. That produced in the vicinity of Antung is consumed as spinning materials at the Antung plant of the Fuji Gass Spinning Company of Japan.

The second by-product is pelette, which becomes a table delicacy of the Chinese in its unprepared form. Pelette oil is used in soap manufacture and also as lubricating oil. The residue left after extracting the oil may also be used as fertilizer.

The industry of weaving pongee silk, a product of tussah silk, has greatly developed in recent years, but on the whole it is yet small. Viewed from the condition of the pongee weaving mills, the industry has made some progress at Antung and its neighbourhood due to the increased demand. But excepting the Chunisaohih Company (純益織造公司) at Mukden, all the mills are small, and the quality of their products is inferior.

The tussah silk industry of Manchoukuo, from the rearing of the silk worms to the filature process, is conducted entirely by the undeveloped primitive method of the Manchurians. A feature of the industry is the low price, and no improvement has been seen in the filature process. Therefore, unless other methods are adopted for the development of the industry, it will be difficult for the tussah silk industry of Manchoukuo to make progress, because of the competition from rayon fabrics.

**Spinning and Weaving of Flax, Hemp, Jute, Etc.**—Manchoukuo is the greatest flax, hemp, and jute consuming region of the Orient, also producing these fibres. The country is favourable for the cultivation of these fibres because of its climatic conditions. The production is said to be about 25,000 metric tons per year. The native crop is almost entirely consumed by the producers themselves, and only a small quantity, about 6,000 metric tons, is shipped to market.

The inhabitants of Manchoukuo are the greatest consumers of these fibres; the demand for gunny bags for packing produce, and for making sailcloth and rope is large. Consequently, although there is quite a large flax and hemp production in Manchoukuo, more has to be imported for making gunny bags, and even then about 40,000,000 to 50,000,000 gunny bags are imported annually, as shown in the following Table 17.

Table 17  
IMPORTS OF GUNNY BAGS

Years	Quantity (pieces)	Value (Hk. Tls.)
1929 .....	50,453,381	14,431,338
1930 .....	31,869,705	10,086,800
1931 .....	44,890,184	15,855,220
Japan.....	10,850,150	2,536,354
China.....	3,674,134	790,607
Hongkong.....	13,104,500	4,391,443
British India.....	11,080,600	5,296,694
U.S.S.R. ....	6,064,700	2,798,264
Others .....	116,100	41,858

Some Japanese, therefore, planned to establish an industry for weaving these fibres in Manchuria and in 1917 the Manchuria Flax, Hemp, and Jute Weaving Company was established at Dairen and in 1918 the Manchuria-Mongolia Fibre Industry Company at Mukden. The total production of gunny bags by these two companies reached more than 3,000,000 bags per year, but yet it was only less than ten per cent of the total gunny bag consumption in the country. It is interesting to note that the greater portion of the material used by the two companies in making gunny bags was jute imported from India. The business result of the two companies has not been satisfactory. The Mukden Flax, Hemp, and Jute Manufacturing Company (formerly the Manchuria-Mongolia Fibre Industry Company) at Mukden was obliged to close its mills in March, 1930.

But the Manchuria Flax, Hemp, and Jute Weaving Company is located in the favourable district of the Kwantung Leased Territory, and because of the transportation facilities and other advantages it is enjoying, the company is continuing operations as the only plant of its kind in Manchoukuo, and fighting the dumping of Indian gunny bags.

Table 18  
FLAX, HEMP AND JUTE INDUSTRY\*

District	Factory	Capital	Production			Value (Yen)
			Yarn (kg.)	Fabric (meters)	Gunny bags (pieces)	
Japanese						
Dairen	1 (Gold)	450,000	115,346	202,943	3,699,543	838,284
Mukden	(1) (")	750,000	—	—	—	—
Total	1 (")	1,200,000	115,346	202,943	3,699,543	838,284
	(1)					

\* (1) Refer to the notes given on page 362.

As modern weaving plants there are only the above-mentioned two companies, but there have been since old times small Chinese hand weaving plants scattered all over Manchoukuo. They produce gunny bags, sailcloth, yarn, twine and rope for various industrial purposes. The production at these small establishments of rope and other products required for agricultural, forestry, fishery, and transportation purposes may be easily understood from the fact that the bulk of the native production, amounting to about 25,000 metric tons per year, is locally consumed.

**Woolen Weaving Industry.**—The sheep in Manchoukuo are largely raised in the western part of Hsingan Province, or the district around Hailar, in the north; the northern part of Fengtien Province, or the districts around Taonan, Tungliao, and Chengchiatun, in the central part; the districts around Chihfeng in Jehol Province and Chinchou in Fengtien Province, in the south. The total number of sheep kept is estimated at 4,000,000 heads, and the total wool production is estimated at more than 4,000 metric tons, calculating the per-head wool at about one kilogramme. The wool at present produced in Manchoukuo is not fit for making high grade fabrics for clothing purposes, and its use is limited to the manufacture of blankets, carpets, and felt. Not only is the per-head wool production small, but its quality is coarse and poor. Furthermore as the civilization of the inhabitants has not yet advanced, the demand for high grade woolen fabrics is small. The sheep are kept mainly for the object of obtaining meat and hide, and wool production is merely subsidiary.

Noticing this condition, the South Manchuria Railway Company has been making efforts to improve the sheep in Manchoukuo at great sacrifices for many years, maintaining a sheep breeding station at Kungchuling. One sheep of the improved variety produced at the Kungchuling Breeding Station produces 3.2 kilogrammes of wool on the average, more than three times the wool production of the native species. When the entire number of sheep kept in Manchoukuo at present, numbering

(2) Small hand-work plants operated by Manchurians are found all over the country, and they are producing gunny bags, sailcloth, gunny bag fastening twine, twine in balls, rope, and other products. The fibre production in Manchoukuo, reaching 25,000 metric tons, is almost entirely consumed locally, but details are unknown.

(3) The gunny bag production of the above-mentioned two companies in past years was as follows:

	Quantity (pieces)	Quantity (pieces)	
1926.....	3,261,758	1929.....	5,243,531
1927.....	3,440,670	1930.....	3,089,697
1928.....	4,720,527	1931.....	3,699,543

4,000,000 heads, is replaced by the improved species, it will mean that there will be produced about 13,000 metric tons of wool. With the establishment of Manchoukuo, conditions have become very favourable for the popularization of the improved species and the development of the industry, and in fifteen years or so much improvement can be expected in this direction, according to the opinion of specialists.

Sheep flocks in the pasturing districts include about 30 per cent of goats for guiding timid sheep, and their number reaches quite a large figure. Goat wool also is considered one of the staple products of the country. Goat wool in its natural condition has many bristles and cannot be utilized, but when it is carded and the bristles removed, it becomes a high grade material. The carded goat wool is called "cashmere" or commonly "camel's hair" in Japan.

Besides sheep wool and goat wool, there are produced camel hair in Inner Mongolia, and cattle hair, horse hair, and pig bristles in the agricultural districts. These hairs are interesting products, and particularly the cattle hair of Manchoukuo is soft and much valued in making blankets.

The woolen spinning and weaving plants in Manchoukuo include the Manchuria-Mongolia Woolen Weaving Company (Mukden), Yuhua Woolen Weaving Mill (Mukden), and Yuchingte Woolen Weaving Mill (Harbin). The Manchuria-Mongolia Woolen Weaving Company was established in 1918 with a registered capital of 10,000,000 gold yen (¥5,000,000 paid-up), but its capital was reduced several times, and in 1931 its registered capital was ¥500,000 with ¥325,000 paid-up.

The Yuhua Woolen Weaving Mill is an individual enterprise operated by a Shantung man named Tsui (崔), who is also operating at present as a cotton yarn and fabric dealer at Harbin. His investment in the mill is 320,000 yuan, and his relatives invested 80,000 yuan. At present the mill is suspending operations.

At present the woolen weaving industry of Manchoukuo is not at all significant because of the undeveloped condition of the country, but with the future development of civilization and improvement of the sheep, it is expected to become promising. The woolen goods production and import of Manchoukuo are as given in the following Tables 19 and 20.

Table 19  
WOOLEN WEAVING INDUSTRY\* (1931)

	Number of Factories	Capital	Production				Value (Yen)
			Cloth (yards)	Blankets (pieces)	Others (kg.)	(sq. meters)	
<b>Japanese:</b>							
Dairen	1	(Gold) 15,000	—	—	—	138	2,707
Mukden	1	(") 1,950,000	165,601	39,477	37,811	—	909,007
Total	2	(Gold) 1,965,000	165,601	39,477	37,811	138	911,714
<b>Manchurian:</b>							
Mukden	1	(Hsienyang) 500	—	—	—	—	—
Chengchiatun	6	(Tayang) 6,500	—	—	—	—	9,200
Tungliao	6	(Hsienyang) 14,400	—	—	—	—	4,370
Total	13	(Mixed) 21,400	—	—	—	—	13,570
<b>Grand Total 15</b>		<b>1,986,400</b>	<b>165,601</b>	<b>39,477</b>	<b>37,811</b>	<b>138</b>	<b>925,284</b>

Table 20  
IMPORTS OF WOOLEN GOODS (Haikwan taels)

Year	Imports	
	Imports	Details for 1931:
1929	7,254,022	Japan ..... 915,210
1930	5,669,488	China ..... 712,448
1931	3,115,005	Great Britain ..... 897,174
		Germany ..... 396,161
		Others ..... 194,012

\* Refer to the notes given on page 362.

There is one woolen weaving mill at Harbin, with a capital of 1,500,000 yuan; workmen 220; daily wool consumption 2,457 kilogrammes.

### Chemical Industry

**General Outline.**—Manchoukuo is rich in natural resources, and particularly in materials for the chemical industry. Generally the materials for the chemical industry are classified into the two kinds of animal and plant materials, and mineral materials. Manchoukuo has many kinds of agricultural materials for the chemical industry, such as soya beans, kaoliang, millet, wheat, maize, tobacco, cotton, cocoons, hemp, flax, jute, and others. Of these soya beans and kaoliang deserve particular attention. The annual production of soya beans is 5,200,000 metric tons, and kaoliang 4,500,000 tons. Forestry products are mainly lumber produced in the Yalu River valley, Kirin, and other North Manchuria districts, and the total volume of standing timber is 2,500,000,000 metric tons, while annually more than 500,000 tons are felled. As animal materials there are cattle, horses, pigs, sheep and others, and besides spinning and weaving industry materials, the quantity of hides and bones produced reaches quite a large amount. As mineral products there are coal, produced at Fushun, Yentai, and Penhsihu; iron ore of Anshan; magnesite, dolomite, limestone, and other carbonic salt minerals; clay, silex, steatite and other silicious or silicate minerals; oil shale covering the coal seams at Fushun; and the sun-evaporated salt produced in the Kwantung Leased Territory, Liaotung and Liaohsi. These are the representative materials for the chemical industry produced in Manchoukuo.

The principal materials are as follow :

Animal and plant materials : soya beans, groundnuts, perilla, sesame, hemp, kaoliang, maize, wheat, barley, lumber, cabbages, animal bones, animal hides, animal hair, etc.

Mineral materials : soft coal, anthracite, oil shale, salt, bittern, silex, feldspar, clay, steatite, flour spar, barytes, dolomite, magnesite, limestone, galena, zinc-blende, iron sulphide ore, gold, various ferrous oxides, amber and others.

(Regarding these resources, refer to the Chapters on Agriculture, Forestry, and Mining).

At present the chemical industry of Manchoukuo is primitive, and there is no important industry outside that of bean oil extraction. The reasons for this condition have already been explained in the general outline of industry. Industries that deserve some attention, besides the bean oil industry, are the by-product industries at the Fushun Colliery and the Anshan Iron Works, operated by the South Manchuria Railway Com-

pany. The general condition of the chemical industry and foreign trade in chemical products is as shown in the following Tables 23 and 24 :

Table 21

## CHEMICAL INDUSTRY\*

	Factories	Capital (Mixed)	Production (Yen)	Total Number of Day-workmen (in a year)
Oil Milling .....	Japanese 9	5,448,752	11,999,699	301,023
	Manchurian (2) 318	19,297,730	64,450,100	1,139,064
	Total (31)(4) 327	24,746,482	76,449,799	1,440,087
Soap & Candle .....	Japanese 4	380,000	143,319	15,001
	Manchurian 24	71,712	182,782	27,407
	Total 28	451,712	326,101	42,408
Refined Bean Oil .....	Japanese 1	250,000	414,748	18,564
	Manchurian —	—	—	—
	Total 1	250,000	414,748	18,564
Cotton Seed & Oil .....	Japanese —	—	—	—
	Manchurian 2	2,000	5,566	4,800
	Total 2	2,000	5,566	4,800
Other Oil & Fat.....	Japanese 1	500,000	423,616	26,150
	Manchurian —	—	—	—
	Total 1	500,000	423,616	26,150
Hide & Leather .....	Japanese 2	100,000	187,440	50,525
	Manchurian 6	31,000	209,784	8,598
	Total 8	131,000	397,224	59,123
Paper .....	Japanese 4	5,290,000	1,665,646	174,888
	Manchurian 9	23,000	15,942	39,715
	Total 13	5,313,000	1,681,588	214,603
Match .....	Japanese 6	1,927,826	385,600	141,188
	Manchurian 10(1)	2,890,000	1,201,366	103,499
	Total 16(1)	4,817,826	1,586,966	244,687
Explosives .....	Japanese 4	1,952,690	972,078	116,152
	Manchurian —	—	—	—
	Total 4	1,952,690	972,078	116,152
Medicine .....	Japanese 5	981,054	134,704	14,516
	Manchurian —	—	—	—
	Total 5	981,054	134,704	14,516
Industrial Chemicals ...	Japanese 6	20,000	1,879,615	137,204
	Manchurian 6	3,700	9,890	8,200
	Total 12	23,700	1,889,505	145,404
Coatings & Pigments...	Japanese 4	420,000	442,694	33,429
	Manchurian 1	85,000	3,450	1,800
	Total 5	505,000	446,144	35,229
Dyestuff .....	Japanese 1	250,000	45,792	3,539
	Manchurian —	—	—	—
	Total 1	250,000	45,792	3,539

\* Refer to the notes on page 362.

	Factories	Capital (Mixed)	Production (Yen)	Total Number of Day-workmen (in a Year)	
Oil Refining .....	{ Japanese	1	...	2,609,593	236,559
	{ Manchurian	—	...	—	—
	{ Total	1	...	2,609,593	236,559
Cokes .....	{ Japanese	3	...	4,701,781	175,884
	{ Manchurian	—	...	—	—
	{ Total	3	...	4,701,781	175,884
Briquets .....	{ Japanese	2	...	658,208	23,812
	{ Manchurian	—	...	—	—
	{ Total	2	...	658,208	23,812
Total .....	{ Japanese	53	17,520,322	26,664,533	1,468,434
	{ Manchurian	376	22,404,142	66,078,880	1,333,083
	{ Total	429	39,942,464	92,743,413	2,801,517
	(32)[4]				
	(34)[4]				

Table 22

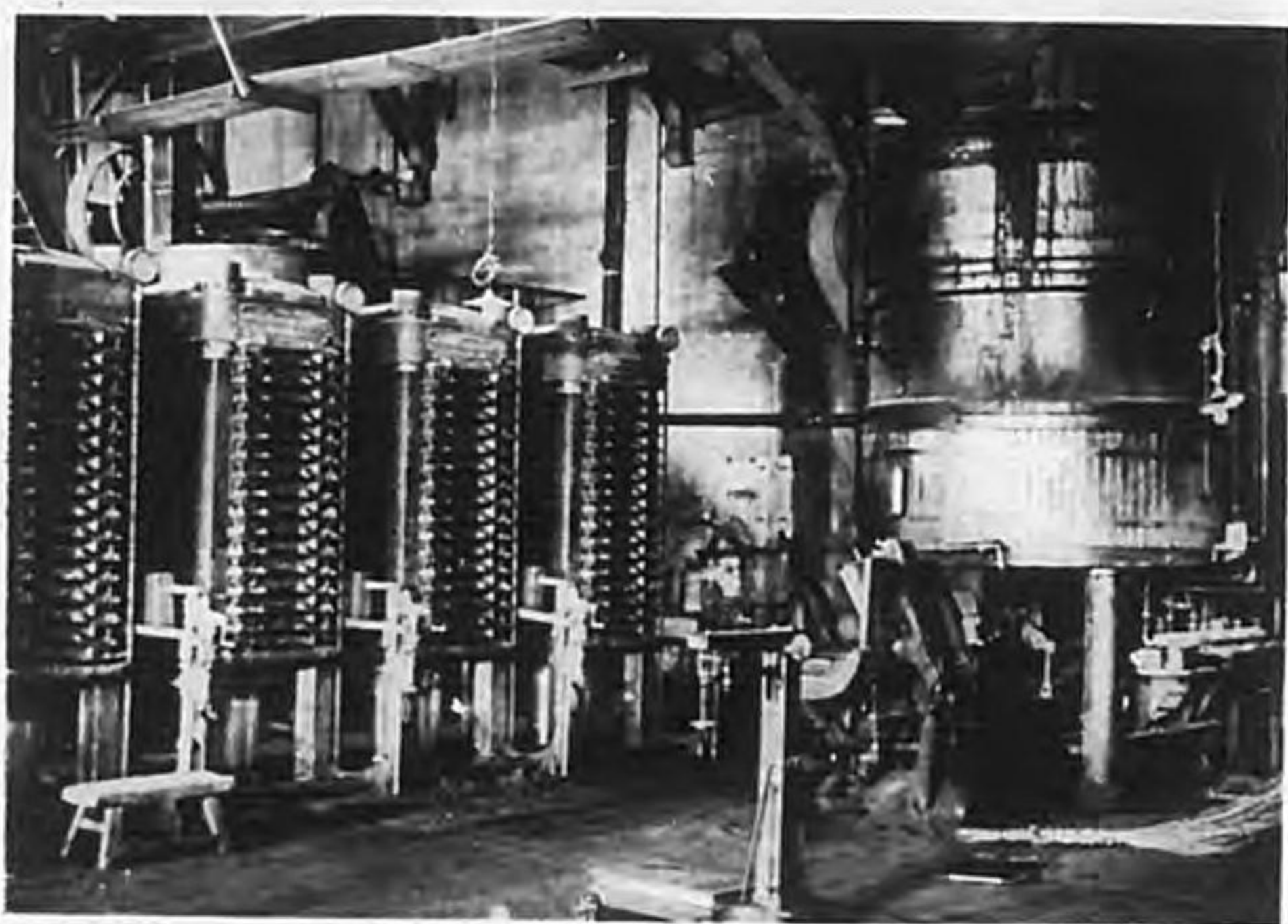
## FOREIGN TRADE OF CHEMICAL INDUSTRY PRODUCTS

(in Haikwan taels)

Articles	Exports		Imports	
	1930	1931	1930	1931
Hides, hair, tusks, teeth, shells & their products (excluding wool).	7,695,162	8,548,229	3,382,650	3,748,231
Beancake & bean oil .....	92,888,491	116,762,355	—	—
Other oils, fats & their products...	2,655,893	4,456,887	14,201,627	10,669,692
Medicines, chemicals, & explosives	5,057,268	7,756,317	9,476,066	8,211,125
Paints, pigments, dyestuffs, & fillings .....	246,785	354,778	3,493,171	2,232,572
Paper & paper products (including books & pictures) .....	1,380,014	1,546,613	11,502,655	8,699,751
<b>Total .....</b>	<b>109,923,613</b>	<b>139,425,179</b>	<b>42,056,169</b>	<b>33,561,371</b>

As can be readily seen from the above tables, the soya bean industry is the greatest in the chemical industry as well as in the general industry of Manchoukuo. If the bean industry were excluded, there is none that could be considered a chemical industry. In foreign trade, only hides, hair, tusks, teeth, bones, and shells show an export surplus, but these products are not industrially finished, and they are mostly exported in a semi-finished state. All other chemical industry products show an import surplus.

Judging from the resources available, the most promising chemical industries in Manchoukuo are the sulphuric ammonia, soda, magnesium, and coal by-product industries. These industries are expected to make



Above, Soya beans at Kaiyuan Station.  
Under, Nisshin Oil Mill at Dairen.

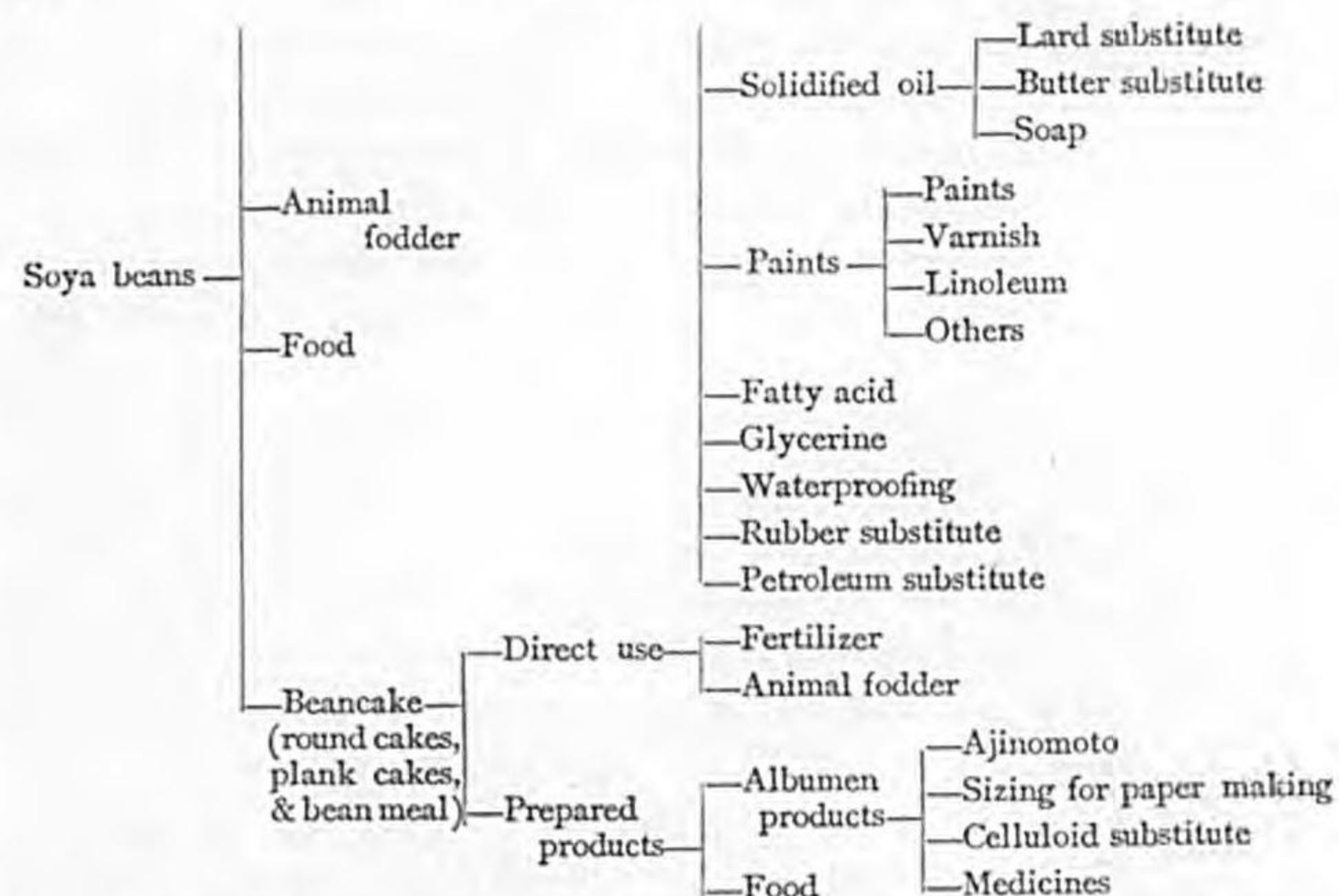
sudden development with the progress of the economic construction of Manchoukuo and the enhancement of Japanese-Manchoukuo relations.

**Oil Milling.**—The history of oil milling in Manchuria is not long, but the industry has made extraordinary development in the past sixty odd years. If an industry that possesses the most striking local colour and importance in Manchoukuo is to be picked out, it is surely this one.

The causes of the remarkable development of the oil milling industry are, first, the abundant supply of soya beans, the material for oil extraction, and second, the superior value the soya bean possesses as oil extraction material and the extensive utilization of beancake, the by-product of bean oil extraction. More than sixty per cent of the world's production of soya beans is grown in Manchoukuo, and the transportation and storage of soya beans are simple. Not only is bean oil cheap compared with other oils, but also it possesses the special advantage of being utilized as comestible, industrial, and for many other purposes. But although bean oil is suited for all these different purposes, it is not the best in each branch of utilization, and it is almost governed by the influence of other oils like linseed oil in industrial use, and of olive and cotton seed oils in the comestible field. However, because of its low cost of production and its long storage possibility, and the large demand for beancake, the bean oil price can be regulated to meet conditions in foreign oil markets. Because of this advantage, it has made signal development in foreign markets year by year. Beancake has superior utilization value in quality, and another strong feature of being the cheapest among the residues of all oils. Beancake has long been used in Japan as fertilizer, and because of its high quality and nutrition value, it has been much used recently as animal fodder and foodstuff. As the albumen content is the cheapest for a fixed quantity of albumen, the utilization of beancake is expected to be greatly expanded in this direction with the future progress of science.

#### UTILIZATION OF SOYA BEANS





*History.*—Formerly in Manchuria, Yufang (油坊) or oil mills meant only linseed oil extraction plants, but some sixty years ago, the linseed oil extraction process was first applied to soya beans in the Tiehling and Changchun districts, the important markets of soya beans, and as the result was satisfactory, the bean oil extraction industry was started. Gradually those engaging in it increased and also the increase of the immigrants from Shantung created a larger demand for bean oil. At that time, bean oil and beancake were produced only to supply local needs, and the surplus output was shipped to southern parts of China via Yingkow. At Liaoyang, Tiehling, Mukden, Yingkow and other places, there existed only small oil mills with the capacity of producing 100 pieces of beancake\*, and the method of oil extraction was very primitive, using mule power or the wedge pressure system.

At that time, oil mills were operated mainly for obtaining oil, and the beancake was fed to domestic animals as a by-product. But as the number of oil mills increased, beancake production surpassed the increase of local consumption, and a market was sought in Japan. The export of beancake to Japan was commenced after the close of the Sino-Japanese War, and as its value as fertilizer became recognized in Japan, the demand rapidly increased and the exportation advanced year by year. With this increase a new epoch was created for the bean mills in Manchuria, and contrary to

\* One piece of beancake weighs 27.6 kilogrammes.

the condition before, beancake became the principal product and bean oil the by-product. Even when the demand for beancake was so largely developed, bean oil was consumed only in Manchuria and China, and there appeared an over-production of bean oil which threatened to handicap the development of the industry. After the close of the Russo-Japanese War, the export of bean oil to Europe and America was started; thus the demand for bean oil and beancake was balanced, and the oil extraction industry was established on a sound foundation, bean oil becoming one of the important export item of Manchuria.

Formerly, in the Kwantung Leased Territory, there was no industry to speak of, but after the Japanese administration was established in the Territory, there were created opportunities for industrial development. As the pioneer industrial activity, a bean oil mill was established at Dairen by a Chinese in 1906. Since then oil mills have increased year by year. Later, as the South Manchuria Railway adopted the policy of concentrating shipments of freight to Dairen, the number of oil mills in Dairen increased to more than fifty within a few years. Though formerly Yingkow was the centre of the bean oil extraction industry and attained the peak of prosperity about 1909, it had to surrender the position to Dairen.

The oil extraction industry of Manchuria, since then, has made very favourable development, and particularly as the demand for bean oil in Europe and America as material for the chemical industry and foodstuff suddenly increased because of the Great War, the price rose considerably and the industry became prosperous. But the rapid increase of bean oil mills caused overproduction, and then confronting the post-war panic, it became very difficult for all the oil mills to continue operations, many being obliged to suspend production. The chronic depression of the industry has not yet been remedied.

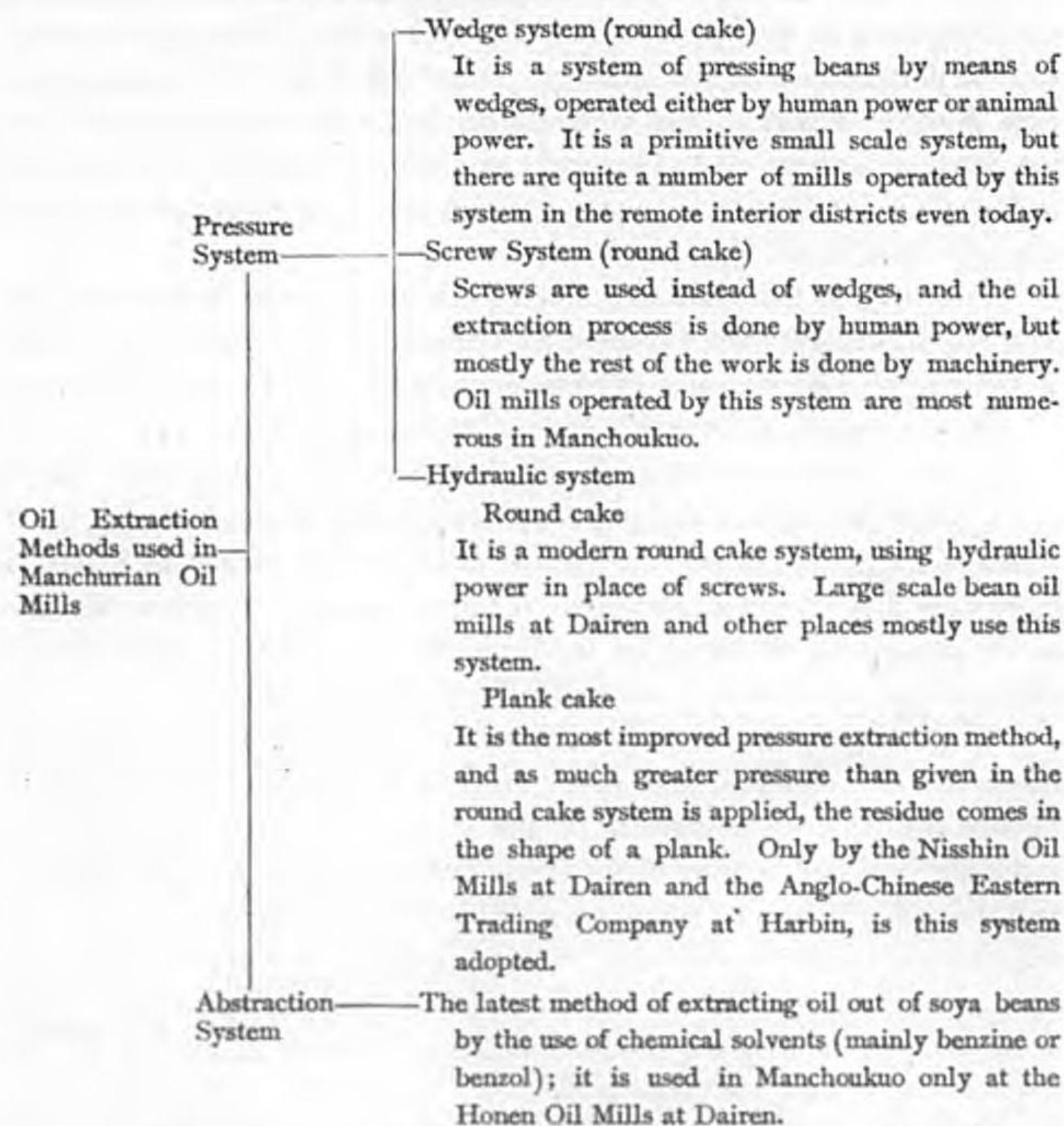
*Oil Extraction Methods.*—The oil extraction methods used in Manchoukuo can be classified as shown in the following table.

The wedge pressure system is the oldest, followed by the screw system, the hydraulic system, and the abstraction system. The new systems are better adapted, of course, for larger production and have a greater oil extraction percentage than the old systems, but the former require a considerable amount of fixed capital. When mills are located in remote districts and the installation of modern machinery is difficult, and the consumption of their products is limited to immediate localities, it is often more economical to use the wedge pressure system which requires only a small construction cost by utilizing cheap labour and land, as small plants



are sufficient to meet local needs.

METHODS OF BEAN OIL EXTRACTION



Besides the above-mentioned methods, a new process of abstracting the oil by using alcohol as the solvent was discovered recently by the Central Laboratory of the S.M.R. Co. The basic experiments are completed, and factory trials have been conducted. This alcohol abstraction method is said to be superior to the Bolman process of Germany. When this process is adopted, beancake produced by it will be suitable as a foodstuff, oil is partially refined, and lecithin will be a valuable by-product. The satisfactory application of this process will create a new epoch in the Manchurian bean oil industry.

*Oil Mills.*—Among the oil mills of Manchoukuo, those having com-

paratively advanced modern equipment, supplying bean oil to the markets in Europe, America, and China, and beancake to Japan, and thus having international activity, are found only at Dairen and Harbin. Numerous small oil mills existing in various districts of South and North Manchuria are operated mainly for supplying bean oil as a foodstuff to local inhabitants. The bean oil mills at Antung are mostly supplying their products to Korea, and those at Yingkow to Southern China.

Table 23  
OUTLINE OF OIL MILLING INDUSTRY

Years	Capital (Mixed)	Number of Factories			Expressing Machine		Producing Capacity per 24 hours		Production of Beancake (Pieces)
		In Operation	In Suspension	Hydraulic System	Screw System	Wedge System	Bean Oil (metric tons)	Beancake (Pieces)	
1925	34,950,100	—	467	2,740	9,969	437	—	531,479	—
1929	57,907,100	—	472	4,189	8,576	145	—	569,921	50,020,042
1930	30,173,333	382	60	4,428	7,195	114	1,391	466,286	50,342,698
1931	24,746,482	327	33	4,034	6,008	39	1,435	483,367	65,976,600
Details for 1931:									
Dairen	9,719,452	45	6	1,942	1,121	—	672	223,847	30,855,500
Yingkow	1,437,000	16	7	352	303	—	119	39,607	6,358,000
Antung	510,000	21	—	152	1,229	—	78	25,503	4,481,500
Harbin	4,540,000	33	—	991	514	—	220	76,187	14,586,800
Districts along the Railway lines in North Manchuria	3,525,000	43	—	434	620	6	129	47,040	5,385,000
Districts along the Railway lines in South Manchuria	5,015,030	169	20	163	2,221	33	217	71,183	4,309,800

Table 24  
LIST OF OIL MILLS\* (1931)

	Number of Factories	Capital	Production			Machines		
			Bean Oil (metric tons)	Quantity Beans (1,000 pieces)	Value (1,000 yen)	Hydraulic System	Screw System	Wedge System
<b>Japanese:</b>								
Dairen	5 (1)	3,608,752 300,000 270,000	33,295 2	7,482.8 † 5,334.0 0.6	11,195.1	271	130	—
Kaiyuan	1 (1)	20,000	690	179.3	213.5	—	16	—
Tiehling	1	500,000	1,475	407.4	457.8	16	—	—
Hsinking	1	750,000	*	180.4	* 132.0	—	50	—
Anta	1	5,448,752	36,003	† 8,250.5 † 6,101.7	11,999.7	297	209	—
Total	9 (2)							
<b>Manchurian:</b>								
Dairen	40 (5)	8,000 4,974,700 828,000	72,209	23,372.7 21,037.2	30,665.8	1,671	991	—
Antung	21	360,000 120,000 30,000	14,525	4,481.5	* 6,513.0	152	1,229	—

\* Refer to the notes given on page 362.

The bean residue output of the Japanese mills at Dairen includes, besides the above-mentioned beancake production, 53,207 tons (¥ 1,944,212) of drawn residue, 11,054 tons (¥ 432,829) of powder residue, and ¥ 925,350 of other forms of residue.

The Dairen beancake production figure marked † is the mixed storage quantity announced by the Dairen Bean Mill Association, and as Industrial Statistics have been using this figure, it is given for convenience in comparison. The figure marked † in the total column is the aggregate of these figures for Dairen.

The figures for Antung are based on the Statistical Annual Report of the Antung Chamber of Commerce and Industry for 1931.

The number of mills, capital amounts, equipments, and production capacity for Harbin are based on the investigation by the Harbin Bean Mill Association published in the Annual Report of the Chinese Eastern Railway for 1932, and the production quantity is calculated on the shipment quantity given in the Annual Report for the same year.

The number, capital amounts, equipments and production capacity of other mills in South and North Manchuria are based on figures given in 'Present Condition of Oil Mills of Manchoukuo' (as at the end of 1929) included in No. 132 of the South Manchuria Railway Investigation Reports; their production quantities are calculated according to the S.M.R. Railway Statistics for 1931 and the shipment quantities given in the Statistical Annual Report of the Chinese Eastern Railway for 1932.

	Number of Factories	Capital	Production			Machines		
			Bean Oil (metric tons)	Quantity Beans (1,000 pieces)	Value (1,000 yen)	Hydraulic System	Screw System	Wedge System
Yingkow	16 (7)	Hsien Tayang* 1,437,000	19,074	6,358.0	* 8,917.0	352	303	—
Harbin	33	Harbin Tayang 4,540,000	* 43,760	* 14,586.8	* 10,709.0	991	514	—
Port Arthur	1	...	36	14.5	20.5	...	...	...
Pitzwo	6	Gold 77,000	232	83.4	95.4	...	120	—
Chinchow	1	" 20,000	65	21.4	27.8	—	15	—
Pulantien	1	" 38,000	10	4.5	5.8	—	13	—
Wafangtien	2	Hsiaoyang 50,000	120	40.8	45.5	—	50	—
Telissu	1 (1)	" 20,000	12	4.0	3.9	—	40	—
Sungshu	2	" 48,000	150	50.0	46.4	—	54	—
Hsukotun	1	" 4,000	36	12.0	14.3	—	5	—
Hsiungyocheng	3	15,000	38	12.9	13.2	—	16	—
Luchiattun	4	16,500	99	33.0	33.8	—	21	—
Kaiping	3	16,000	74	25.0	26.2	—	24	—
Tashihchiao	2	2,700	31	10.0	11.7	—	16	—
Haicheng	1	4,000	24	8.0	7.8	—	6	—
Liaoyang	13 (9)	547,200	1,095	364.6	365.6	—	225	—
Yentai	2	60,000	547	173.0	176.4	—	27	—
Mukden	3	Hsien Tayang 29,000	196	58.4	60.5	—	11	—
Hushihtai	1	Gold 30,000	38	11.3	14.2	—	10	—
Hsinchengtzu	3	" 40,000	125	37.1	38.5	—	24	—
Kaiyuan	4 (1)	" 114,400	565	175.0	206.6	—	112	—
Chengtu	4 (3)	Hsien Tayang 664,000	222	63.1	72.6	—	205	—

	Number of Factories	Production			Machines		
		Bean Oil (metric tons)	Beancake (1,000 pieces)	Value (1,000 yen)	Hydraulic System	Screw System	Wedge System
Saupingkai	3	74	21.6	26.2	—	20	7
Kungchuling	(1)	54	18.3	15.0	—	12	—
	(2)	388	121.9	132.2	—	90	—
Hsinking	(1)	1,781	602.1	624.1	54	15	2
	(6)	769	238.9	277.1	—	84	—
	[4]	475	218.3	235.5	—	50	—
Fushun	5	234	65.0	80.5	—	84	—
Penbsihu	3	126	52.0	43.5	—	55	—
Chengchiatun	6	96	72.0	35.4	—	20	—
Tungliao	(1)	—	—	—	—	—	—
Taonan	5	—	—	—	—	—	—
Taonan	5	—	—	—	—	—	—
Other South Manchurian Districts	72	* 2,790	* 930.0	* 935.4	83	718	24
Other North Manchurian Districts	43	* 16,155	* 5,385.0	3,953.7	434	620	6
Total	318	176,228	57,726.1	64,450.1	3,737	5,799	39
Grand Total	(31) [4] 327 (33) [4]	212,231	65,976.6	76,449.8	4,034	6,008	39
		24,746,482	155,390.6	161,492.3			

Table 25 EXPORTS OF SOYA BEANS, BEANCAKE, AND BEAN OIL. \*

(in Metric Tons)

	Soya Beans			
	Year 1929-30	Year 1930-31	Year 1931-32	Year 1932-33
To Japan	Dairen 438,597	343,192	264,324	397,603
	Vladivostok 56,998	85,008	164,568	—
	Yingkow 17,672	65,965	75,101	38,985
	Antung 8,863	4,413	351	5,963
	Total 522,130	498,578	504,344	442,551
To European Countries	Dairen 905,902	684,416	922,964	1,446,996
	Vladivostok 404,092	767,895	462,470	189,641
	Total 1,309,994	1,452,311	1,385,434	1,645,637
To U.S.A.	Dairen 24	141	109	—
To South Sea	" 98,715	89,849	73,189	55,961
To U.S.S.R.	" 1,968	—	—	—
To China	Dairen 201,387	164,667	362,616	23,821
	Vladivostok —	—	262	—
	Yingkow 95,987	258,385	186,999	99,420
	Antung 48	4,512	50,564	9,476
	Total 297,432	427,564	600,441	132,717
To Korea	Dairen —	—	—	—
	Yingkow —	—	—	—
	Antung 5,035	8,222	7,689	7,678
	Total 5,035	8,222	7,689	7,678
Total	Dairen 1,646,603	1,282,265	1,623,202	1,924,381
	Vladivostok 461,090	852,903	627,300	198,641
	Yingkow 113,659	324,350	262,100	138,405
	Antung 13,946	17,147	58,604	23,117
	Grand Total 2,235,298	2,476,665	2,571,206	2,284,544

	Beancake			
	Year 1929-30	Year 1930-31	Year 1931-32	Year 1932-33
To Japan	Dairen 663,522	608,030	609,655	607,006
	Vladivostok 404,041	461,404	245,094	615
	Yingkow 61,923	69,720	75,171	60,911
	Antung 15,669	13,531	5,580	25,592
	Total 1,145,155	1,152,685	935,500	694,124
To European Countries	Dairen 17,658	34,436	64,589	70,690
	Vladivostok —	3,914	1,342	—
	Total 17,658	38,350	65,931	70,690
To U.S.A.	Dairen 41,404	19,450	15,227	24,120
To South Sea	" 149	273	477	461
To U.S.S.R.	" —	—	—	—
To China	Dairen 142,819	151,303	232,843	12,981
	Vladivostok —	—	—	—
	Yingkow 69,684	181,573	178,349	164,923
	Antung 42,589	52,421	97,491	56,833
	Total 255,092	385,297	508,683	234,737

\* A year in the above table is from October to the following September.

	Year 1929-30	Year 1930-31	Year 1931-32	Year 1932-33
To Korea.....	Dairen 6,670	5,105	6,321	6,320
	Yingkow —	61	—	—
	Antung 49,432	56,844	29,657	20,240
	Total 56,102	62,010	35,978	26,560
Total .....	Dairen 872,222	818,597	929,122	721,578
	Vladivostok 404,041	465,318	246,436	615
	Yingkow 131,607	251,354	253,520	225,834
	Antung 107,690	122,796	132,728	102,665
	<b>Grand Total 1,515,560</b>	<b>1,658,065</b>	<b>1,561,796</b>	<b>1,050,692</b>

## Bean Oil

	Year 1929-30	Year 1930-31	Year 1931-32	Year 1932-33
To Japan.....	Dairen 93	115	115	102
	Vladivostok 6,997	8	—	—
	Yingkow —	—	—	—
	Antung —	5	—	—
	Total 7,090	128	115	102
To European Countries.	Dairen 104,276	69,846	35,893	34,026
	Vladivostok —	6,591	4,294	—
	Total 104,276	76,437	40,187	34,026
To U.S.A. ....	Dairen 7,087	4,405	209	2,173
To South Sea .....	" 5	28	4	—
To U.S.S.R. ....	" 1,124	—	—	—
To China.....	Dairen 13,443	46,301	88,997	25,660
	Vladivostok —	—	—	—
	Yingkow 2,007	16,537	13,332	8,198
	Antung —	674	6,913	4,684
	Total 15,450	63,512	109,242	38,542
To Korea.....	Dairen 6	45	12	17
	Yingkow —	—	—	—
	Antung 149	633	11	3
	Total 155	678	23	20
Total .....	Dairen 126,034	120,740	125,230	61,978
	Vladivostok 6,997	6,599	4,294	—
	Yingkow 2,007	16,537	13,332	8,198
	Antung 149	1,312	6,624	4,687
	<b>Grand Total 135,187</b>	<b>145,188</b>	<b>149,780</b>	<b>74,863</b>

*Depression of Oil Extraction Industry.*—In recent years, the oil extraction industry of Manchuria has followed a declining path year after year, because of the decrease of the demand for beancake under the pressure of sulphate of ammonium, a chemical fertilizer; the low price of silver; and the almost entire suspension of bean oil export due to the development of the oil extraction industry in Europe.

In Japan, which was formerly the most important consumer of beancake, sulphate of ammonium has come to be largely used as a nitrogen

fertilizer and in consequence the market for beancake in Japan is fundamentally threatened. The bean oil industry is basically a simple one, which has little room for improvement, while it is difficult to quickly lower its production cost as the price of soya beans, the raw material, is under a certain restriction. On the other hand, the production cost of sulphate of ammonium has been gradually lowered, following the advance of science. Again, by the advance of the agricultural knowledge of Japanese farmers and also by the guidance and encouragement given by the Japanese Government authorities, the use of sulphate of ammonium has gradually become common among farmers and therefore the demand for beancake shows a declining tendency.

Then there is also the rise of the oil extraction industry in Europe. In European countries, particularly Germany, where the oil extracting technique has recently made signal progress, it has become more profitable to import soya beans than to import bean oil.

Although the South Manchuria Railway Company and bean mill operators are considering various measures to revive the bean oil industry, bean oil mills are still operating under difficulties, influenced also by the world-wide depression. Their operating results are generally unsatisfactory, and mills in South Manchuria have been obliged to make 50 to 60 per cent production restriction in recent years.

**Solidified Oil Industry.**—In this industry, there is the Dairen Oil and Fat Company established in 1916, with a capital of 250,000 Japanese yen. The company's production in 1931 was 1,756 metric tons of solidified oil and 52 tons of compressed gas, with a total value of 414,748 yen. Solidified soya bean oil almost equals beef tallow in quality, and is valuable as a butter substitute and material for making soap and candles.

The oil extraction industry of Manchoukuo is threatened with being gradually reduced, while the future of the solidified oil industry is promising with the revolutionary development of the bean oil extraction method, as solidified bean oil is a refined bean oil.

**Soap Manufacture.**—It is only a little over ten years ago that soap came to be generally used by the Manchurians. At first the supply entirely depended upon low grade soaps imported from foreign countries. Gradually the imported amount showed an increasing tendency, but as the supply of European and American soaps was stopped with the outbreak of the Great War, Japanese soaps mostly took their places. But in recent years, Chinese soaps have been imported in quite a quantity, particularly laundry soaps.

Table 26  
IMPORTS OF SOAP  
(in Haikwan taels)

		Total Imports	Imports from Japan	Imports from China
Laundry Soap...	1929.....	416,470	42,123	245,362
	1930.....	498,781	62,895	404,064
	1931.....	488,663	72,198	387,707
Toilet Soap.....	1929.....	883,713	727,969	16,389
	1930.....	921,879	682,911	98,902
	1931.....	556,008	346,010	161,316
Total .....	1929.....	1,300,183	770,092	261,751
	1930.....	1,420,660	748,806	502,966
	1931.....	1,044,671	418,208	549,023

As beef tallow, the material for making toilet soaps, and beancake lees, the material for laundry soaps, are abundantly obtainable in Manchuria, soap manufacture has often been attempted by Japanese. But because of the disadvantage in obtaining the supply of perfuming materials, packing materials and other materials, the primitive manufacturing method, and the competition with cheap soaps imported from Japan, most of such plants had to suspend or give up operation, and there now remain only two or three establishments, including the Manchurian Soap Manufacturing Company and the Bangyoku Company (Japanese management). At Mukden, Dairen, and other places there are Manchurian soap makers who produce low grades of toilet soap, but they are insignificant. Every district has several makers of laundry soaps, but they are small in equipment and cater only to local needs.

These soap manufacturing companies are generally engaged in producing candles additionally.

Table 27  
SOAP AND CANDLE INDUSTRY\* (1931)

	Factories	Capital	Soap		Candles	
			Quantity (kg.)	Value (Yen)	Quantity (kg.)	Value (Yen)
<b>Japanese:</b>						
Dairen .....	3	(Gold)	381,628	105,311	30,070	28,008
Hsinking .....	1	"	—	10,000	—	—
Total .....	4	(Gold)	381,628	115,311	30,070	28,008
<b>Manchurian:</b>						
Dairen .....	4	(Gold)	98,603	15,035	53,000	20,070
Wafangtien .....	1	(Hsiao-yang)	24,000	1,840	—	—
Liaoyang .....	4	(Tayang)	—	10,060	7,319	2,853
Mukden .....	3	(Hsien-yang)	—	42,448	—	—
Fushun .....	1	(Gold)	—	2,000	46,386	10,125
Kaiyuan .....	1	(Hsien-yang)	—	—	63,703	17,729
Hsinking .....	3	(Gold)	—	19,805	175,236	37,979
Kirin .....	3	(Hsien-yang)	—	—	—	—
		(Manchoukuo yuan)	—	1,720	—	—
Taonan .....	2	(Harbin-yang)	—	—	557	93
Tsitsihar .....	2	(Manchoukuo yuan)	—	—	—	—
Total .....	24	(Mixed)	122,603	8,410	346,201	88,849
<b>Grand Total .....</b>	<b>28</b>	<b>(Mixed)</b>	<b>504,231</b>	<b>8,410</b>	<b>376,271</b>	<b>116,857</b>

\* Refer to the notes given on page 362.

In North Manchuria there are 12 factories at Harbin, with a total capital of 92,000 yuan, 289 workmen, and soap production of 208,500 yuan Harbin Tayang; these factories generally engage also in the production of candles.

In the districts along the North Manchuria Railway lines, there are 1 factory at Manchouli, 4 at Hailar, 1 at Mientuho, and 1 at Suifenho; the total soap production capacity of these factories is 200 metric tons a year; the candle production in North Manchuria is estimated at 1,000 metric tons a year.

Besides those above-mentioned products there are also produced cottonseed oil, cottonseed residue, animal fertilizer, animal tallow, glue and others, but their outputs are small.

**Hide and Leather Industry.**—Manchoukuo possesses large numbers of animals, and is known as a great hide producing territory. But good hides and leather are not yet produced there, the hide and leather industry having not yet developed as an independent industry. The products are mostly exported as raw hides, and tanned leather is imported. The foreign trade figures for hides and leather in the past three years are as follow :

Table 28  
IMPORTS AND EXPORTS OF HIDES AND LEATHER  
(in Haikwan taels)

	Exports	Imports
1929 .....	5,990,347	5,593,513
1930 .....	5,377,870	2,961,107
1931 .....	5,929,357	2,002,587
Japan .....	3,078,875	584,126
U.S.A. ....	1,987,849	171,389
China .....	672,696	730,657
U.S.S.R. ....	—	227,273
Others .....	189,937	289,149

As hide and leather manufacturing companies there are two or three operated by Japanese. The Manchuria-Mongolia Industrial Company is unable to show the expected results on account of poor business. On the other hand, those operated by Manchurians are showing considerable progress, and the number of plants reaches quite a large figure. But excepting the Fengtien Provincial Leather Plant at Mukden, and the Chinese Leather Plant, all others have only old-fashioned equipment, and their production is small, as shown in the following table :

Table 29  
HIDE INDUSTRY\* (1931)

	Factories	Capital	Production		Value (Yen)
			Hides (pieces)	Hair (metric tons)	
<b>Japanese:</b>					
Dairen .....	1	(Gold) 100,000	24,690	—	165,040
Mukden .....	1	( " ) (500,000)	64,000	—	22,400
Total .....	2	( " ) 100,000	88,690	—	187,440

\* See footnote on p. 413.

	Factories	Capital	Production		Value (Yen)
			Hides (pieces)	Hair (metric tons)	
<b>Manchurian:</b>					
Port Arthur .....	1	—	1,030	—	2,165
Dairen.....	3	(Hsioyang) 16,000	8,547	—	37,556
Pulantien .....	1	—	433	—	1,875
Mukden .....	1	(Gold) 15,000	11,500	52,676	168,188
Total .....	6	(Mixed) 31,000	21,510	52,676	209,784
<b>Grand Total</b> .....	<b>8</b>	<b>(Mixed) 131,000</b>	<b>110,200</b>	<b>52,676</b>	<b>397,224</b>

**Paper Manufacturing Industry.**—Manchoukuo has great forest zones in the Yalu, Sungari, Tumen, Mutankiang, and Lalin River districts; districts along the North Manchuria Railway lines; Sansing district; and Khingan Range mountain districts. The total area of these forest zones reaches 36,000,000 hectares and the volume of standing timber is estimated at about 2,500,000,000 metric tons, while the annual felling is said to be 500,000 tons. There is great room for future utilization of these forest zones, and the possibility of the development of the paper manufacturing industry also is great. But the forest zones of Manchoukuo cover an extremely wide area, and as the transportation facilities are undeveloped, timber transportation is expensive. Consequently the forests in remote interior districts are not yet fully utilized. The industry using timber as raw material is pulp and paper manufacturing. But at present the Yalu Paper Manufacturing Company, established at Antung in 1919 with a capital of ¥5,000,000, and the branch mill of the Oji Paper Manufacturing Company, established in 1922 at Shingishu across the Yalu River from Antung, both of which were established for utilization of the Yalu River valley timber, are the only ones to be noted. The modern paper mills include those of the Manchuria Paper Manufacturing Company, established at Dairen in 1918 with a capital of ¥500,000, and the Yingkow Paper Manufacturing Company, established in 1925 with a capital of ¥100,000, but later amalgamated with the Manchuria Paper Manufacturing Company.

\* (1) Refer to the notes given on page 362.

(2) At Harbin there are 8 factories, with 54 workmen and annual production capacity of 5,500 pieces of animal hides.

(3) In North Manchuria, there are also one factory at Manchouli with production capacity of 8,000 hides a year, and 2 factories at Hailar with production capacity of 2,500 hides a year.

There was also a notable plan for establishing another modern paper mill. In the days of the former military rule, Chang Hsueh-liang realized the increasing demand for paper and the abundance of materials for paper manufacture, and as the result of investigations made in the Sungari River district, he found a suitable place for erecting a paper mill in the Pichou district in Huatien-hsien, Kirin Province, and also a place suitable for the erection of an electric generating station in the Laohui district, 12 or 13 kilometres away, and so planned the establishment of the Northeastern Paper Mill, in October, 1930. This company was to be established with a capital of 5,000,000 yuan, and the production of the first operating year was to be 11,500 metric tons, while the annual profit was expected to be 2,000,000 yuan. But this plan fell through on account of the Manchurian incident. The district selected by Chang Hsueh-liang is particularly rich in timber for paper manufacture, and also is well favoured in its water supply and topographical conditions. Furthermore the district has the advantage of being reached by the Shenghai Railway. It has supplies of coal, sulphur, lime and other materials near at hand.

As already mentioned Manchoukuo abounds in timber, the material for pulp manufacture, but yet it is impossible to obtain the supply of timber economically. Then Manchoukuo has the further disadvantage of having to obtain chemicals and other materials from foreign countries. Other conditions, excepting the low labour cost, are all unfavourable compared with conditions in Japan. Furthermore in securing capital, and in obtaining the supply of water, motive power, and fuel, and also in the matter of freight rates, Manchoukuo is greatly handicapped in the development of the paper manufacturing industry.

Manchoukuo imports large amounts of paper from Japan and China annually, as shown by the following table (based on the Manchuria Trade Returns for 1931):

1929 .....	7,650,178	Haikwan taels
1930 .....	7,880,656	
1931 .....	5,863,487	
Details for 1931:		
Japan .....	3,337,712	
China .....	2,187,410	
Others .....	338,365	

About 75 per cent of the total paper production of Manchoukuo is contributed by the Yalu Paper Manufacturing Company and the Manchuria Paper Manufacturing Company. The balance is produced by Chih-

fang (紙坊), household paper-making plants that are found everywhere throughout Manchoukuo. The products of these old-fashioned household plants are Chinese paper, but also almost all the products of the modern mills are substitutes for Chinese paper. Thus it can be said that the paper production in Manchoukuo is entirely consumed by Manchurians, and only a small portion of the production by modern machinery is shipped to the Shantung and Tientsin districts, the rest being consumed in Manchoukuo.

The native paper is produced by a primitive household manufacturing system. The native paper merely supplies a small portion of local needs, and as it is much oppressed by imported paper every year, it is not expected to make any development. But the native paper will not be easily eradicated as it enjoys the geographical advantages of being locally produced and has a special quality of its own. As the Manchurian Chihfang exist all over the country, it is difficult to learn their present condition.

Table 30

## PAPER MANUFACTURING INDUSTRY (1931)\*

	Factories	Capital	Production		Value (Yen)
			Quantity (metric tons)		
<b>Japanese:</b>					
Dairen .....	1	(Gold) 230,000	452	—	67,227
Fushun .....	1	( " ) 60,000	284	758 bundles 8,204 chien	85,286
Antung .....	1	( " ) 5,000,000	7,110	—	1,469,780
Yingkow .....	1	( " ) (230,000)	* 292	—	43,353
Total .....	4	( " ) 5,290,000	8,138		1,665,646
<b>Manchurian:</b>					
Dairen .....	1	(Hsiaoyang) 2,000	22	—	3,375
Wafangtien ...	1	( " ) 300	—	—	—
Kirin .....	3	(Manchoukuo yuan) 17,500	—	10,000 pi	6,734
Chengchiatun	2	(Tayang) 1,300	—	—	644
Tungliao .....	1	(Tayang) 500	—	—	690
Taonan .....	1	(Manchoukuo yuan) 1,400	—	5,600 tao	4,499
Total .....	9	(Mixed) 23,000	22		15,942
<b>Grand Total</b>	<b>13</b>	<b>(Mixed) 5,313,000</b>	<b>8,160</b>		<b>1,681,588</b>

\* (1) Refer to the notes given on page 362.

(2) The Japanese mill at Antung has pulp production capacity of 15,000 metric tons a year; the paper production capacity is 8,000 tons a year.

(3) Respecting the native paper mills or Chihfang, the following figures for 1929 are given for reference.

Also the Manchuria-Mongolia Chemical Fibre Industry Company is to be noticed as a paper manufacturing company. This company has a mill at Tunghwa, Kirin, with a capital of ¥5,000,000. It is a joint Japanese-Manchurian company, the Japanese investment being 80 per cent and the Manchurian capital 20 per cent. The company aims to produce pulps for paper and rayon manufacture—10,000 metric tons in the first year and 100,000 tons yearly five years later,—and to undertake paper manufacture several years later.

**Medicines, Industrial Chemicals and Explosives.**—Important articles coming under this classification are the by-products of coal at Fushun, industrial chemicals produced at various important places, and matches. At present there are not many products other than the above-mentioned. Consequently the foreign trade of these products is always showing an import surplus, Japan being the principal source of supply.

Table 31

FOREIGN TRADE OF MEDICINES, INDUSTRIAL CHEMICALS  
AND EXPLOSIVES (in Haikwan taels)

	Exports	Imports
1929 .....	4,026,455	9,614,494
1930 .....	5,027,508	9,476,066
1931 .....	7,756,317	8,211,125
Japan .....	1,919,821	3,300,454
Hongkong .....	1,206,203	140,627
China .....	4,577,503	1,495,901
Great Britain .....	—	791,093
Germany .....	—	365,064
Others .....	52,790	2,117,986

Districts	Factories	Capital (calculated in yen)	Production (yen)
Wafangtien .....	1	3,877	8,572
Liaoyang .....	6	6,603	44,454
Mukden .....	10	81,338	263,779
Tiehling .....	2	3,187	33,611
Hsinking .....	3	10,279	42,478
Kirin .....	4	2,912	168,638
Antung .....	3	5,557	6,882
Chengchiatun .....	8	17,127	20,312
Taonan .....	3	6,720	27,821
Tsitsihar .....	3	6,580	27,647
Chientao .....	1	5,000	8,000
Total .....	44	149,230	652,194

**Medicinal Manufacture.**—The industry of manufacturing medicines and medicinal materials in Manchoukuo is still primitive. At Dairen there are the Manchuria-Mongolia Industrial Company's medicinal plant, and four other factories producing medicines and medicinal materials; their total capital reaches ¥980,000, and their production in 1931 was 38,256 kilogrammes of liquorice essence valued at ¥21,562, and other medicinal products valued at ¥113,142. The production of liquorice essence is almost entirely exported to Japan.

**Industrial Chemicals Manufacture.**—Among industrial chemicals produced in Manchoukuo the most important are the by-products of coal at Fushun, and also at Anshan, Mukden, Dairen and other cities there are some productions, but they are quite insignificant except only the products of the Anshan Iron Works. The condition of the industrial chemicals manufacture in Manchoukuo is as follows:

Table 32

## INDUSTRIAL CHEMICAL INDUSTRY\* (1) (1931)

Factories	Capital	Production				Value (yen)
		Quantity				
		Hydro- chloric Acid (metric tons)	Sulphate of Sodium (metric tons)	Chlorine (kl.)	Hydrogen (kl.)	
<b>Japanese:</b>						
Dairen .....	1 (Gold) 20,000	447	671	—	—	37,327
Fushun .....	1	—	—	26,110	9,627	28,999
Mukden .....	1	—	—	64,000	—	39,680
Total .....	3 (Gold) 20,000	447	671	90,110	9,627	106,006

Table 33

## INDUSTRIAL CHEMICAL INDUSTRY\* (2) (1931)

Factories	Capital	Production					Value (yen)		
		Quantity							
		Sulphuric Acid (metric tons)	Sulphuric Ammonia (metric tons)	Naph- thaline (metric tons)	Benzol (kl.)	Creosote (kl.)	Pitch (metric tons)		
<b>Japanese:</b>									
Anshan .....	1	—	7,078	5,279	355	2,324	2,840	8,245	726,927
Fushun .....	2	—	27,919	—	—	—	4,774	7,907	1,046,682
Total .....	3	—	34,997	5,279	355	2,324	7,614	16,152	1,773,609
<b>Manchurian:</b>									
Chengchiatun..	6 (Tayang) 3,700	—	—	—	—	—	—	—	9,890
<b>Grand Total ...</b>	<b>9</b>	<b>—</b>	<b>34,997</b>	<b>5,279</b>	<b>355</b>	<b>2,324</b>	<b>7,614</b>	<b>16,152</b>	<b>1,783,499</b>

**Explosive Manufacture.**—Gunpowder is produced by the Manchuria Mining Explosives Manufacturing Company established at Antung in

\* Refer to the notes on page 362,



1919, and the annual production is valued at more than ¥250,000. Also quite a large quantity of gunpowder is produced at the Fushun Colliery for its own consumption, by utilizing the by-products of the Mond gas plant. Formerly most of the mining explosives used in Manchuria were foreign products, and much inconvenience was experienced in their handling and transportation, and also because of the high freight rates. Manchoukuo can supply all the necessary materials for the production of explosives for mining purposes, except only sulphur and saltpetre. With cheap labour and other advantages, the future of this industry is believed to be promising.

Due to the necessity caused by the maintenance of peace and order, Manchoukuo has decided to control the manufacture of explosives by private persons, and to undertake their sales by the government. It seems that the manufacture of explosives is to be mainly undertaken by the Ordnance Works at Mukden.

Table 34  
EXPLOSIVE MANUFACTURE (1931)

	Factories	Capital	Production			Value (Yen)
			Gun Powder (kg.)	Quantity Other Explosives (Pieces) (Metres)		
Japanese:						
Fushun .....	3	(Gold) 952,690	1,623,632	7,933,176	3,722,302	821,794
Antung .....	1	( " ) 1,000,000	306,463	2,629	—	150,284
Total ...	3	( " ) 1,952,690	1,930,095	7,935,805	3,722,302	972,078

*Match Manufacture.*—The match manufacturing industry of Manchuria dates from the establishment of the Sino-Japanese Match Company of Japan at Changchun (Hsinking) in November, 1906 with the plan of utilizing the match stick material produced in Kirin Province. Later match manufacturing companies were established at Kirin, Yingkow, and other places. Particularly during the Great War, the match industry of Manchuria made great progress, as match makers in Japan were unable to give their attention to Manchuria because they were wholly occupied with the demand from the South Sea Islands and India. As the supply of white poplar timber is abundant at Antung, large match companies of Japan established plants there for making match sticks. Also at Kirin and Yingkow match manufacturing companies were started by Chinese, to compete with the Japanese matches. When the Great War ended and the reaction of the financial depression set in, the match industry of Manchuria was seriously affected and fell into a depressed state. Manchuria

has, however, the advantages of an abundant supply of materials and cheap labour. Chinese match makers of Manchuria made remarkable progress, having been especially stimulated by the advance of the Chinese Customs tariff, and consequently there was rivalry among them to control markets. Because of such situation, Japanese and Chinese match makers of Manchuria held conferences in 1922, and finally agreed to form a sales and production agreement and organized the North Manchuria Match Company (北滿火柴公司) in May, 1923, in order to regulate the sales fields and to restrict production. Then in July, 1923, the Association of the North and South Manchuria Match Manufacturers was formed, and all makers joined in cooperation to restrict production and to unify sales prices. In 1926, the Fengtien Huilin Company (奉天惠臨公司), a Chinese firm, broke the agreement and greatly extended its sales fields. In the meanwhile, the Swedish match trust became active, attempting to control the match market of Manchuria. Thus the match industry of Manchuria was placed in unheard-of confusion.

The Swedish match trust, after conquering the match industry of Japan, easily established its influence in Manchuria. The Sino-Japanese Match Company, and the Kirin Match Company, both under Japanese management, invited investment by the Swedish match trust in 1925, because of their depressed business condition. Out of 6,000 shares of the Sino-Japanese Match Company, the Swedish trust held 3,600 shares; and out of 15,000 shares of the Kirin Match Company, the Swedish capital had 10,500 shares. Also the Dairen Match Company, under Japanese management, was bought up by the Swedish trust in 1926. Three Japanese match manufacturing companies in Manchuria were thus all placed under the control of the Swedish match trust.

Securing control of the three important companies in the Northeastern Provinces, the Swedish match trust attempted to monopolize the match market of Manchuria, and to oppress other companies by adopting a dumping policy. Then the Chinese match makers formed the Match Makers' Association of the Three Eastern Provinces, and tried to stand against the Swedish trust. In 1928 the Hozan Match Company and the Changchun Match Company were newly established as purely Japanese enterprises; and Chinese also erected match factories at Ashiho and Hulan. Thus again there appeared a war of match makers. A plan was proposed of forming a new Match Makers' Association of the Three Eastern Provinces by including the newly established factories. The Swedish trust rejected the proposal, and planned to throw the small establishments

into disorder by free competition. However, finally the Match Makers' Association of the Three Eastern Provinces was formed in February, 1929, and the Chinese and Japanese makers joined under a cooperative agreement. Despite this step, the confusion in the match market could not be removed, because of the dumping policy carried on by the Swedish trust.

The former Northeastern authorities, therefore, took measures to oppress the Swedish match trust by means of taxation, and particularly the establishment of the match monopoly system in the Northeastern Provinces, which became quite a controversial problem prior to the recent incident, dealt a severe blow to the Swedish match trust.

The match production and import are shown in Table 40.

The bulk of the matches imported through the three ports of southern districts is supplied by the Daido Match Company of Japan.

Table 35  
MATCH INDUSTRY\* (1931)

	Factories	Capital	Production	
			Quantity (cases)	Value (yen)
<b>Japanese:</b>				
Dairen .....	1	(Gold) 130,326	10,068	78,983
Hsinking .....	4	( " ) 1,475,000	55,117	302,617
Kirin .....	1	( " ) 322,500	800 *	4,000
Total .....	6	( " ) 1,927,826	65,985	385,600
<b>Manchurian:</b>				
Mukden .....	1	(Hsienyang) 220,000	* 13,400	* 73,700
Antung .....	1	( " ) 1,200,000 (1 unknown)	30,998	168,836
Yingkow .....	3	( " ) 500,000	187,000	* 725,560
Kirin .....	2(1)	( " ) 320,000	* 34,000	* 170,000
		(Hsiaopiao) 100,000		
Tsitsihar .....	1	(Harbin-yang) 100,000	12,000	33,670
Hulan .....	1	( " ) 300,000	* 4,700	* 18,800
Ashiho .....	1	( " ) 150,000	* 2,700	* 10,800
Total .....	10(1)	(Mixed) 2,890,000	284,798	1,201,366
<b>Grand Total.....</b>	<b>16(1)</b>	<b>( " ) 4,817,826</b>	<b>350,783</b>	<b>1,586,966</b>

\* (1) Refer to the notes given on page 362.

(2) The condition of the match industry in 1931 having been unknown, it was difficult to obtain exact production amounts, and consequently in some cases the production amounts were estimated according to the production condition of 1932 and other factors.

(3) One case of matches contains 240 packages of ten small boxes each, or 200 dozens.

**Dyestuff, Pigment, and Coating Material.—Dyestuff Manufacture.**—The Chinese formerly used a great quantity of indigo for dyeing their clothing, and many engaged in the manufacture of dyes on a small scale, using indigo produced in North Manchuria and China, and the bark of pagoda trees or maple trees as material. But since German dyes were introduced into Manchuria, foreign chemical dyes were so heartily welcomed because of their cheapness and convenience in use that the old-fashioned dyes were immediately disregarded entirely. However, during the Great War, the importation of German dyes was suspended, and Japanese and American products were substituted. Prices rapidly rose on account of the shortage of supply, and therefore, the cultivation of native indigo was again revived. Vegetable dyes are inferior to chemical dyes in all respects, and as the prices advanced, dye

(4) At Antung, besides those mentioned in the table there are four Japanese factories exclusively engaged in making match sticks, and their total capital is ¥70,000, and production 16,496 bales valued at ¥76,055.

(5) When these match companies are classified by the nationality of their capital, the following table is obtained (as standing in 1930):

Investing Countries	Number of Factories	Capital Invested (in 1,000)	Production Capacity per 24 hours (cases)
Japanese.....	2	¥ 220	270
Controlled by Japanese, but Swedish Capital .....	4	¥2,300	740
Manchurian .....	11	2,070 Yuan (Hsien Tayang) 100 Yuan (Siver Note) 550 Yuan (Harbin Tayang)	2,030

(6) The import amount of matches into Manchoukuo is as follows:

	Quantity (Gross)	Value (Hk. Tls.)
1927 .....	445,864	151,697
1928 .....	448,678	167,823
1929 .....	430,797	174,924
1930 .....	401,443	154,090
1931 .....	758,707	253,037
Details for 1931:		
China .....	619,899	149,810
Japan .....	111,908	87,895
U.S.S.R. ....	26,900	15,332

users greatly suffered. It is clear that Manchoukuo having an abundant supply of coal and salt is well favoured for the chemical dye industry. At present, however, this industry is still undeveloped on account of oppression by the cheap imported dyes. There is only the Yamato Dye Manufacturing Company established at Dairen in 1919 with a capital of ¥2,000,000. On its establishment, the company showed fairly good results, but soon afterwards it was oppressed by German dyes. Receiving a serious blow, it was obliged to reduce its capital to ¥500,000 in 1930.

Production of the company in 1930 was 212,500 metric tons valued at ¥70,840, and in 1931, 152,640 metric tons valued at ¥45,792.

*Pigment and Coating Manufacture.*—Manchoukuo has various advantages for the pigment and coating manufacturing industry. The country produces in large quantities vegetable drying oils which are extracted from soya beans, linseed or perilla. Also Manchoukou abounds in limestone and barytes, mineral pigment materials. Nevertheless, while Japan levies import duty on lead and rosin imported from Australia, the United States, and the South Sea Islands, the Kwantung Leased Territory can obtain these supplies free of duty as it is a free trade zone. Despite these advantages, there now exists only the Manchuria Paint Company, established at Dairen in 1919 with a capital of ¥500,000 (¥300,000 paid-up) in this industry of manufacturing paints. This company is now producing paints, mixed paints, paint oil, aqueous wall paints, varnish, putty, illuminating paint, hydrozincite and others. The company's products fill not only the needs in Manchuria, but also are supplying the entire territory of China.

The production of dyestuff, pigment, and coating in Manchoukuo is as follows :

Table 36  
DYESTUFF, PIGMENT AND COATING INDUSTRY (1931)

Factories	Capital	Production			Value (yen)
		Quantity			
		Dyestuff (kg.)	Pigment (kg.)	Talc (metric tons)	
<b>Japanese :</b>					
Dairen .....	1 (Gold) 300,000	1,321,720	466,085	—	400,001
Haicheng .....	2 ( " ) 20,000	—	—	1,120	23,400
Yingkow .....	1 ( " ) 100,000	—	—	877	19,293
Total .....	4 (Gold) 420,000	1,321,720	466,085	1,997	442,694
<b>Manchurian :</b>					
Tashihchiao .....	1 (Tayang) 85,000	—	—	300	3,450
<b>Grand Total .....</b>	<b>5 (Mixed) 505,000</b>	<b>1,321,720</b>	<b>466,085</b>	<b>2,297</b>	<b>446,144</b>

Also recently (February, 1933), the Japanese-Manchurian Dyestuff Manufacturing Company was established. The Japan Paint Manufacturing Company is the principal shareholder of the new company, which is established with a capital of ¥1,000,000 (¥250,000 paid-up). The company's main office and factory are established at Mukden, and it engages in the production of various dyestuffs, pigments, oils and fats. The production of the company is proposed to be 2,500,000 metric tons under the first period plan, and 7,500,000 tons under the second period plan.

The import and export of dyestuffs, pigments, and coatings in the recent three years are as follows :

Table 37

## FOREIGN TRADE OF DYESTUFF, PIGMENT, AND COATING

(in Haikwan taels)

	Exports	Imports
1929 .....	148,464	3,999,086
1930 .....	246,785	3,493,171
1931 .....	354,778	2,232,572
{ Japan .....	54,109	661,553
{ China .....	289,263	879,313
{ Others .....	11,406	691,706

**Promising Chemical Industries.**—*Sulphuric Ammonia Industry.*—The production of sulphuric ammonia in Manchoukuo is made entirely as a by-product at Fushun (for details refer to the Chapter on Mining). But primarily this industry is extremely important. Being in a position to utilize cheap and abundant coal, the South Manchuria Railway Company had entertained a plan for establishing a sulphuric ammonia plant for some time, but it was only materialized in 1933 when the Manchuria Chemical Industry Company was established at Dairen. The company expects to commence operations from 1935 and will possess equipment to produce 180,000 metric tons of sulphuric ammonia annually.

*Magnesite Industry.*—Manchoukuo is famous as a great magnesite ore producing territory, and it is reported that in the Tashihchiao district there is a deposit of 20,000,000,000 tons, one of the largest and best deposits in the whole world. The principal ingredient of magnesite is magnesium which is contained in the form of carbonate. Magnesite is an important

material for making fire bricks required for the furnaces of steel works, or may also be utilized in making lignoid, artificial marbles, and various other industrial chemicals. (Refer to the Chapter on Mining).

Although the method of producing metallic magnesium out of magnesite ores has not yet been industrially operated, the researches made by the Central Laboratory of the South Manchuria Railway Company, and the Institute of Physical and Chemical Researches (Japan) have almost been completed, and the materialization of this new industry is believed to be only a question of time. Already the Japanese-Manchurian Magnesium Company was established with a capital of ¥7,000,000, and the company is to establish its factories at Ube and Naoyetsu in Japan, and to use the magnesite ores produced at Tashihchiao.

*Aluminium Industry.*—Alumina shale, material for producing aluminium, is found in unlimited quantities at Fuchow, Chinchow, Yentai, Penhsihu and other places in Manchoukuo (Refer to the Chapter on Mining). This mineral is, at present, used as fire-proofing material. The process of industrially producing aluminium out of this shale has been perfected, and there are already proposed to be erected the Japanese-Manchurian Aluminium Company and the Manchuria Aluminium Company. The former is proposed to be established with a capital of ¥5,000,000 and to erect factories in Japan, while the latter is said to be operated by the South Manchuria Railway Company in Manchoukuo.

*Soda Manufacture.*—In Manchoukou there is no industrial production of soda. However, there is produced 900 to 1,200 metric tons annually of natural soda at the Tapusuyupaotzu (大布蘇城泡子), Poliyutientzu (玻璃城甸子), and other soda lakes of Mongolia. Soda being one of the basic materials of the chemical industry, it is even said that the condition of the soda industry is the key to determine the status of the industry of a country. Manchoukuo is in a favourable position for the supply of limestone and sulphurate of ammonium, materials for the production of soda-ash and the Manchurian production of salt (30,000 m.t. annually) being enormous it is found difficult to dispose of the surplus salt production every year because of the competition of Shantung salt. It is, therefore, advisable to establish a soda industry in Manchoukuo to utilize this surplus salt and also to control the soda market of Japan which is annually importing a large amount of soda. On the proposal of the Kwantung Government, soda manufacture was planned in Manchuria, so the Kwantung Soda Ash Manufacturing Company is projected. The company plans to erect a factory capable of producing 54,000 metric tons

of soda-ash annually, with a capital of ¥5,500,000. Also the Liaotung Tsaohui Kungssu (Soda Company) is proposed to be established by private businessmen with a capital of ¥3,000,000, but the question of having harmonious relation with the former company is being discussed.

*Kaoliang Pulp Industry.*—It must be remembered that as a substitute for wood pulp there is kaoliang pulp in Manchoukuo. Kaoliang pulp is the fibre obtained from kaoliang stalks by chemical treatment. The outer skin of the stalk makes the best pulp, and the gnarly parts and leaves come next. The kaoliang fibre belongs to the wood fibres according to the scientific classification, and its quality is between those of bamboo and straw. It is most suitable to be used as a substitute for wood pulps.

There are two methods of producing kaoliang pulp, the sulphite acid and the soda methods. The experiments conducted at the S. M. R. Central Laboratory have been very successful. Kaoliang pulps in their unbleached condition become materials for producing lower grades of paper, but when they are bleached, they become materials for wrapping paper, printing paper, and note paper. Recently with the progress of the chemical industry, generally pulps have become to be used as chemical industry materials besides as material for paper manufacturing, as, for instance, for making acetic acid and viscose rayons. Just the same as wood pulps, kaoliang pulps will also be greatly utilized for these purposes. The production of kaoliang stalks in Manchoukuo is estimated at 9,000,000 metric tons a year, from which 3,000,000 tons of pulps may be produced. But as a practical question, kaoliang stalks are almost entirely used by the farmers as fuel and building materials, and therefore it is believed that only about 10 per cent or 1,000,000 tons of kaoliang stalks can be utilized for producing 300,000 tons of pulps.

As a plant for the utilization of kaoliang stalks, there is the Liaoyang factory to be erected by the Tokyo Cork Industry Company with a capital of ¥500,000. The products of the company will be compressed carbonized kaoliang board, pipe-coverings, wall boards, floorings, ceilings, and other kaoliang stalk products.

*Coal Dry Distillation and Oil Shale Industry.*—Respecting the details about the coal dry distillation industry, and the oil shale industry, refer to the Chapter on Mining. Also as a reference the production of cokes, briquettes, and shale oil at Fushun, Anshan, and Penhsihu are given in the following tables:

Table 38\*

## (1) COKES (1931)

Factories	Capital	Production				Value (yen)
		Quantity				
		Cokes (metric tons)	Tar (kl.)	Gas (1,000 cubic meters)	Others (metric tons)	
<b>Japanese :</b>						
Anshan ...	1 (S.M.R.)	389,268	14,937	—	71	3,613,734
Fushun ...	1 ( " )	5,697	204	1,326.8	—	128,194
Penhsihu	1 (Tayang) (7,000,000)	93,358	—	—	331	959,853
Total ...	3	488,323	15,141	1,326.8	402	4,701,781

## (2) BRIQUETTE (1931)

Factories	Capital	Production	
		Quantity (metric tons)	Value (yen)
<b>Japanese :</b>			
Anshan.....	1 (S.M.R.)	402	2,613
Fushun.....	1 ( " )	69,010	655,595
Total .....	2 ( " )	69,412	658,208

## (3) SHALE OIL (1931)

Factory	Capital	Production			Value (yen)
		Quantity			
		Oil & Wax (metric tons)	Cokes (metric tons)	Sulphuric Ammonia (metric tons)	
<b>Japanese :</b>					
Fushun .....	1 (S.M.R.)	112,329	3,398	15,183	2,609,593

## Metal Industry

The metal industry of Manchoukuo is yet quite insignificant if the metal refining industry is excluded (refer to the Chapter on Mining). Impossibility to meet the competition of cheap foreign products is the cause of the undeveloped state of this industry. The production of the metal industry, excluding that of the metal refining industry, is only 1,113,464 yen, or less than 10 per cent of the total metal industry production which stands at 10,029,593 yen.

\* Refer to the notes given on page 362.

The Penhsihu plant is the joint Japanese-Manchurian enterprise, but for convenience' sake, it is included among Japanese enterprises; among the coke ovens at Penhsihu there are included 20 open furnaces.

Table 39

## METAL INDUSTRY (1931)\*

	Factories	Capital (Mixed)	Production (Yen)	Total number of day- workmen (in a year)	
				(in a year)	
Metal Refining.....	Japanese	× 1	× 7,000,000	× 1,932,034	55,879
	Manchurian	2	9,168,125	6,978,095	170,125
	Total	× 1	—	× 1,932,034	—
Iron Casting.....	Japanese	× 1	× 7,000,000	× 5,061	58,500
	Manchurian	7	551,000	149,274	57,115
	Total	× 1	—	× 1,932,034	—
Nails, etc.....	Japanese	5	241,526	203,343	37,927
	Manchurian	3	4,000	12,312	9,759
	Total	8	245,526	215,655	47,686
Metal Netting .....	Japanese	1	4,500	12,001	2,400
	Manchurian	—	—	—	—
	Total	1	4,500	12,001	2,400
Tin-plate Goods .....	Japanese	1	2,500	3,965	1,961
	Manchurian	5	1,800	2,801	7,145
	Total	6	4,300	6,766	9,106
Metal Furnitures and Furnishing .....	Japanese	12	96,000	105,457	38,933
	Manchurian	2	1,500	2,530	5,480
	Total	14	97,500	107,987	44,413
Iron Rods & Frames ...	Japanese	9	444,000	220,767	71,552
	Manchurian	—	—	—	—
	Total	9	444,000	220,767	71,552
Metal Wares.....	Japanese	—	—	—	—
	Manchurian	11	105,000	228,102	19,904
	Total	11	105,000	228,102	19,904
Other Metal Products ...	Japanese	4	56,300	36,179	26,361
	Manchurian	13	19,400	15,788	21,743
	Total	17	75,700	51,967	48,104
Total.....	Japanese	43	24,563,951	9,646,176	520,753
	Manchurian	63	227,850	383,417	130,221
	Total	106	24,791,801	10,029,593	650,974

\* Refer to the notes given on page 362.

× denotes Japanese-Manchurian joint management.

Table 40

## METAL REFINING INDUSTRY (1931)\*

Factories	Capital	Production			
		Pig Iron		Special Steel	
		Quantity (metric tons)	Value (yen)	Quantity (metric tons)	Value (yen)
<b>Japanese:</b>					
Dairen .....	1 (Gold)	589,247	—	—	206 423,903
Anshan .....	1 ( " )	8,578,878	269,494	6,554,192	—
Total .....	2 ( " )	9,168,125	269,494	6,554,192	206 423,903
<b>Japanese-Manchurian:</b>					
Penhsihu .....	1 (Hsienyang)	7,000,000	65,620	1,932,034	—
Grand Total ...	3 (Mixed)	16,168,125	335,114	8,486,226	206 423,903

## Machinery and Utensil Industry

Machinery and utensils included under this heading are steam boiler ; motor ; machinery and tools for agricultural, civil engineering, building, mining and metallurgic, spinning and weaving, lumbering, chemical industry, and comestible industry purposes ; weights and measures ; electric machinery and tools ; ordnance ; vehicles (mainly repairing) ; and ships.

The main industry of Manchoukuo is agriculture, and then comes mining, forestry, and such basic industries. Agriculture is operated according to the small scale farming system, and consequently the demand for machinery and tools is very limited. Then manufacturing industry, as well as mining and forestry, cannot yet be said to be highly developed, and thus the machinery and utensil industry of Manchoukuo is in a pessimistic condition when viewed from the standpoint of demand. But as the total railway line in Manchoukuo increased from 3,363 kilometres in 1908 to 6,186 kilometres in 1930, the demand for locomotives and other railway machinery and tools has been considerable. Respecting the electric industry, also, it may be said that quite a large demand for machinery and tools exists.

To view the situation from the standpoint of supply, it is unreasonable to expect the production of high grade products such as machinery by the primitive manufacturing industry of Manchoukuo which has just developed beyond the stage of household industry. The condition of tools and utensils, excepting special articles, may be quite different from that of machinery, but yet they are in the same condition as machinery in the fact that they cannot compete with foreign products.

Thus generally speaking, the machinery and utensil industry of Manchoukuo is not in a favourable condition, but in the future it is expected

\* Refer to the notes given on page 362.

that this branch of industry will make progress in Manchoukuo as the demand for machinery and tools is expected to increase due to the present tendency of the development of agriculture, mining, forestry, manufacture, and transportation since the establishment of Manchoukuo, and also as there are produced coal and iron in comparatively large quantities. But quite a long time will be required for Manchoukuo to stop the coming of foreign machinery and tools.

The recent condition of the demand and supply of machinery and utensils in Manchoukuo is as shown in the following table.

Table 41  
MACHINERY AND UTENSIL INDUSTRY (1931)\*

	Factories	Capital	Production (yen)	Total number of day- workmen (in a year)	
				(in a year)	
Machinery & Tools I	Japanese	5 (Gold)	398,500	155,163	82,658
	Manchurian	[4] (Mixed)	11,900	23,737	28,426
	Total	[1] (Mixed)	410,400	178,900	111,084
" II	Japanese	[5] (Gold)	583,407	1,851,568	781,426
	Manchurian	[13] (Mixed)	18,800	62,175	36,349
	Total	[2] (Mixed)	602,207	1,913,743	817,775
" III	Japanese	[15] (Gold)	649,850	5,999,510	442,406
	Manchurian	[9] (Mixed)	515,150	269,761	136,845
	Total	[1] (Mixed)	1,165,000	6,269,271	579,251
Ordnance.....	Japanese	—	—	—	—
	Manchurian	7 (Mixed)	500,009,000	23,461,334	3,254,368
Vehicles I .....	Total	7 (Mixed)	500,009,000	23,461,334	3,254,368
	Japanese	× 1	—	—	× 2,005
	Manchurian	[2] Δ 2	—	4,439	1,439,814
" II .....	Total	× 1 Δ 2	—	999,167	Δ 630,000
	Japanese	[2] (Gold)	50,000	155,167	38,983
	Manchurian	[3] (Mixed)	64,000	65,544	69,125
Ships .....	Total	[3] (Mixed)	114,000	221,711	108,108
	Japanese	[3] (Gold)	940,000	1,241,606	244,355
	Manchurian	1 (Mixed)	532,000	306,730	50,000
Total	6 (Mixed)	1,472,000	1,548,336	294,355	

\* Refer to the notes given on page 362.

× indicates Japanese-Manchurian joint management.

Δ indicates Manchurian-Soviet joint management.

	Factories	Capital	Production (yen)	Total number of day- workmen (in a year)	
Total .....	Japanese	77 (Gold)	2,621,757	16,032,810	3,031,647
	Manchurian	[31] 107 (Mixed)	501,150,850	26,647,728	5,797,869
	<b>Total</b>	[4] <b>184 (Mixed)</b>	<b>53,772,607</b>	<b>42,680,538</b>	<b>8,829,516</b>

Table 42

## IMPORTS OF WATCHES, CLOCKS, SCIENTIFIC INSTRUMENTS, SHIPS, VEHICLES, MACHINERY, AND THEIR PARTS

	Vehicles (Hk. Tls.)	Others (Hk. Tls.)	Total (Hk. Tls.)
1929 .....	10,852,991	13,404,882	24,257,873
1930 .....	7,577,122	17,876,575	25,453,697
1931 .....	4,138,595	11,413,304	15,551,899
{ Japan .....	2,071,039	6,178,428	8,249,467
{ China .....	206,394	678,964	885,358
{ U.S.A. ....	472,977	1,457,964	1,930,941
{ Germany .....	544,039	1,478,321	2,022,360
{ U.S.S.R. ....	451,413	768,700	1,230,113
{ Others .....	392,733	850,927	1,243,660

**Machinery and Tools.**—The machinery and tool industry makes only very limited production, and is mainly engaged in repairing work. Of the total production amount, more than 95 per cent is represented by Japanese establishments; the production at Dairen, Anshan (where an iron work is located), and Fushun (where a colliery is located), reaches ¥7,833,135 or 93.7% of the total production value.

Table 43

## MACHINERY AND TOOL INDUSTRY (1931)—I\*

	Factories	Capital	Production		Total Value (Yen)	
			Locomotive (Yen)	Motor (Yen)		
<b>Japanese :</b>						
Port Arthur.....	1	(Gold)	12,000	9,659	—	9,659
	[1]		[15,000]	2,850	—	2,850
Dairen .....	2	( " )	296,500	108,771	—	108,771
Mukden .....	2	( " )	90,000	6,923	18,000	24,923
	[1]		[4,500]	2,000	—	2,000
Fushun .....	[2]	( " )	[70,000]	6,960	—	6,960
Total .....	5	( " )	398,500	137,163	18,000	155,163
	[4]					
<b>Manchurian :</b>						
Dairen .....	1	(Hsioyang )	4,000	...	6,750	6,750
Mukden .....	3	(Hsienyang)	7,900	14,812	...	14,812
Kaiyuan .....	[1]	( " )	[50,000]	...	2,175	2,175
Total .....	4	(Mixed)	11,900	14,812	8,925	23,737
	[1]					
<b>Grand Total</b> .....	<b>9</b>	<b>(Mixed)</b>	<b>410,400</b>	<b>151,975</b>	<b>26,925</b>	<b>178,900</b>
	[5]					

\* Refer to the notes given on page 362.

Table 44  
MACHINERY AND TOOL INDUSTRY (1931)—II\*

	Factories	Capital	Production							Total (Yen)
			Agricultural, Civil Engineering, Building (Yen)	Mining, Metallurgical (Yen)	Spinning, Weaving (Yen)	Lumbering (Yen)	Chemical Industry (Yen)	Comestible Industry (Yen)		
<b>Japanese:</b>										
Port Arthur	[1]	(Gold) [12,000]	—	—	—	—	—	—	—	7,900
Dairen	1	( " ) 1,000	—	—	—	—	3,500	—	—	3,500
Anshan	[3]	[199,126]	—	8,565	—	—	—	3,200	2,400	14,165
Mukden	[1]	( " ) 541,407	—	512,218	—	—	—	—	—	512,218
	[2]	[45,000]	—	3,300	—	—	—	—	—	3,300
Fushun	8	( " ) [40,000]	1,240	—	1,800	—	—	—	—	3,040
	[3]	( " ) 10,000	—	1,188,561	—	—	—	55,473	—	1,244,034
Penhsihu	1	( " ) [25,000]	—	6,783	—	—	—	12,992	—	19,775
Antung	2	( " ) 15,000	—	2,700	—	—	—	—	—	2,700
	[3]	( " ) 16,000	—	—	—	28,536	—	—	—	28,536
Total	13	Gold 583,407	1,240	1,722,127	3,200	5,050	37,086	75,815	10,300	1,851,568
	[13]				5,000					
<b>Manchurian:</b>										
Dairen	1	(Hsiaoyang) 6,000	—	—	—	—	—	32,431	—	32,431
Tiehling	1	(Hsienyang) 2,000	—	—	1,000	—	—	1,500	1,600	4,100
Kaiyuan	5	( " ) 3,800	4,506	—	—	—	—	1,206	7,000	11,506
	[1]	[50,000]	—	—	—	—	—	—	1,382	2,588
Ssuningkai	[1]	( " ) [1,000]	2,000	—	—	—	—	—	—	2,000
Kungchuling	1	( " ) 4,000	2,550	—	—	—	—	—	—	2,550
Hsinking	1	(Gold) 3,000	—	—	2,800	—	—	—	4,200	7,000
Total	9	(Mixed) 18,800	9,056	—	3,800	—	—	35,137	14,182	62,175
	[2]									
<b>Grand Total</b>	<b>22</b>	<b>(Mixed) 602,207</b>	<b>10,296</b>	<b>1,722,127</b>	<b>8,800</b>	<b>37,086</b>	<b>110,952</b>	<b>24,482</b>	<b>1,913,743</b>	
	[15]									

\* Refer to the notes given on page 362.



Table 45  
MACHINERY AND TOOL INDUSTRY (1931)—III\*

Factories	Capital	Weights, Measures (Yen)	Production			Total (Yen)
			Electric Machinery and Tools (Yen)	Others (Yen)		
<b>Japanese:</b>						
Port Arthur .....	[25,000] (Gold)	—	—	3,091	—	3,091
Dairen .....	545,350 ( " )	26,682	68,524	472,403	—	567,609
Anshan .....	[541,407] ( " )	—	—	519,397	—	519,397
Mukden .....	11,500 ( " )	19,080	—	8,150	—	27,230
Fushun .....	[132,000] ( " )	—	364,532	29,430	—	29,430
Penhsih .....	80,000 ( " )	—	—	4,465,174	—	4,829,706
Antung .....	[6,000] ( " )	—	—	3,700	—	3,700
Total .....	[15,000] ( " )	—	2,900	3,000	—	3,000
	649,850 (Gold)	45,762	435,956	13,447	—	16,347
				5,517,792	—	5,999,510
<b>Manchurian:</b>						
Dairen .....	8,300 (Hsiaoyang)	—	—	6,035	—	6,035
Mukden .....	346,850 (Hsienyang)	—	2,300	104,926	—	107,226
Tiehling .....	[2,000] ( " )	—	—	1,580	—	1,580
Harbin .....	157,750 (Harbin-yang)	—	—	*	—	153,440
Tsitsihar .....	2,250 (King-yang)	—	—	*	—	1,480
Total .....	515,150 (Mixed)	—	2,300	267,461	—	269,761
<b>Grand Total</b> .....	<b>1,165,000</b> (Mixed)	<b>45,762</b>	<b>438,256</b>	<b>5,785,253</b>		<b>6,269,271</b>

\* Refer to the notes given on page 362.

In item 'Others' of production for Harbin is included ¥2,220 of musical instruments (accordion).

**Ordnance Industry.**—The ordnance industry is the most important in the machinery and utensil industry operated by Manchurians, and the total production reaches ¥23,461,334 or nearly 90 per cent of the total production of machinery and utensils by Manchurians, which is ¥26,647,728.

Representative factories among seven factories producing ordnance, which are listed in the industrial statistics, are the Mukden Ordnance Works established in 1921 and the Mukden Trench Mortar Works established in 1925, both of which were formerly the government establishments of the Northeastern military government. Their total capital was 500,000,000 yuan, and the monthly production capacity of these two works was 10,050,000 rounds of rifle bullets, 45,000 shells, and 12 guns. The works produced and repaired smokeless powder, explosives, fuses, powder for guns, rifles, machine guns, trench mortars, locomotives, machinery and tools, besides undertaking the refining and castings of metals. They obtained the supply of sulphuric anhydride, materials for making smokeless powder, from their attached factory possessing a daily production capacity of 5 metric tons. In 1925, the works had the capacity of producing only 100 shells a day, but were surprisingly developed in a few years.

The works owed much to the guidance given by British engineers, and the management and equipments are large and rational, possessing an electric generating station of 10,000 k.w.h. In 1931, the works had 13,000 workmen and production valued at 23,460,000 yen. Thus they are regarded as the most representative ones of Manchurian factories, together with the Mukden Spinning and Weaving Mill.

As the first step toward making the Mukden Ordnance Works a joint Manchurian-Japanese stock company, the Mukden Ordnance Works, Limited, was established and registered in November, 1932, for utilizing a portion of the works. The newly formed company has a capital of ¥2,000,000. Since the establishment of the company, it is engaged not only in the production and repair of arms and war materials, but also in producing and supplying the goods for public needs.

**Vehicle Industry.**—The production of vehicles in Manchoukuo is very small compared with the total length of railway lines and the number of railway cars (1,308 locomotives, 1,642 passenger coaches, and 21,673 freight cars), and it was only ¥9,000,000 in 1931. Then of this total sum, the production of new cars took up only ¥1,600,000 (Japanese factories), and the greater portion represents repairing and reconstructing. Classifying the production by nationality, the Japanese production is ¥6,600,000 or 72 per cent of the total, and the majority of Japanese production or

¥ 5,900,000 is for Dairen.

The largest machine manufacturing plant in Manchoukuo is the Railway Workshop of the South Manchuria Railway Company (Shahokou, Dairen). Its construction works, started in 1908 and completed in 1911, is laid out on an extensive scale, with its own system of water supply, and every form of modern equipment and convenience. The plant has facilities for handling 27 locomotives, 36 passenger coaches and 130 freight cars simultaneously, and is able to manufacture and repair various machines and tools.

This workshop is accepting orders from various other railways and firms, besides supplying the needs of the South Manchuria Railway Company. In 1931, the total production and repairing reached ¥ 7,128,805. The works was formerly called the Dairen Works, but in June, 1930 it was renamed the Railway Workshop.

As a company to be noted particularly, there is the Dairen Machinery Works, and although the works does not make or repair railway cars only, it will be explained here for convenience' sake.

This company was established in 1918 with a capital of ¥ 2,000,000 as a stock company, and is doing the subcontracted works for the S. M. R. Railway Workshop. Its products are cars, rail accessories, bridges, machinery, water pipes, bean oil milling machines, road-rollers, oxygen gas producing machine, tramcars, automobile bodies, and others. Railway cars and rail accessories are supplied to the Huhai, Taoang, Tsiko, Kihai, Kingtu, and Kitung railways; railway necessities other than cars to the Ssutao Railway as freight cars are loaned to this line by the S.M.R.; railway necessities other than cars also to the Kiaotsi Railway in Shantung Province, China; cars to the Central Light Railway, Keinan Railway, and Seisen Railway, in Korea; machinery to Korea and Manchoukuo; water pipes to the Kwantung Government, the S. M. R. Co., North and South Manchuria, Tsingtao, Tientsin, Korea, Taiwan and other places in increasing quantities every year; bean oil milling machinery to Korea, Taiwan, and Manchoukuo; tramcars to the South Manchuria Electric Company, and Mukden Tramcar Company; automobile bodies to the Bus Service of the Kwantung Government and the Automobile Department of the South Manchuria Electric Company. The markets for the products of the company are very extensive and the sales amount is annually increasing, and it is counted as one of the most active among factories in Manchoukuo operated by Japanese. The company's production in 1931 included passenger and freight cars ¥ 60,500, machinery ¥ 507,462, machinery repair ¥ 75,525, and oxygen gas ¥ 42,767.

Table 46  
PRODUCTION OF RAILWAY CARS (1931)\*—I

	Factories	Work	Production				Total (Yen)
			Locomotive Number	Passenger Coaches Value (Yen)	Freight Cars Number	Others Value (Yen)	
<b>Japanese:</b>							
Dairen .....	3 [2]	New Reconstruction Inspection Repair	— — 259	— 126,445 1,060,130	112 — 18,766	1,073,158 — Auto. 355,389	1,958,234 — 1,132,741
Total .....	3 [2]	Parts Others	4 —	4,091 158,538	6,969	Auto. 1,614	1,173,312
Other Districts along S.M.R. line .....	15		263	1,349,204	25,847	2,180,585	5,897,583
Total .....	18 [2]		351	281,207	38,244	275,410	726,774
<b>Japanese-Manchurian:</b>							
Penhsihu .....	1	Light Railway Repair Parts	9	1,284	280	1,430	2,732
Total .....	1		9	520	280	1,169	1,707
			9	1,804	280	2,599	4,439

Manchurian:		10	92	187,272	167	33,577	1,295	78,782	230,000	529,631
Shenghai, Fengshan, Yingkow Railway Districts .....										
Tatung, Chengtung Railway Districts .....	4	78	9,668	27	2,151	47	2,765	—	—	14,584
Ssulao, Taonang, Kaifeng Rail- way Districts .....	5	72	15,590	45	3,409	100	34,626	—	—	53,625
Tsiko, Huhai Railway Districts...	3	21	56,503	40	55,278	312	40,865	...	...	152,646
Kichang, Kitung Railway Dis- tricts.....	6	37	133,311	20	23,816	58	56,298	35,256	35,256	248,681
Total .....	28	300	402,344	302	118,231	1,812	213,336	265,256	265,256	999,167
Manchurian-Soviet:										
Harbin .....	2	Inspection Repair	IOI	671,154	324 Repair	343,025	1,796	409,845	35,256	1,459,280
Total .....	2		IOI	671,154	369	343,025	1,796	409,845	35,256	1,459,280
Grand Total .....	49[2]		1,024	2,705,713	4,598	1,160,171	67,979	3,081,775	2,139,584	9,087,243

\* Refer to the notes given on page 362.

In the column of production capacity, those marked with  $\Delta$  indicate the number of locomotives allotted. Production amounts which cannot be classified are added together and shown in a separate column. Production capacity differs much according to the degree of repairs to be made, but in the table are given actual results. The factory at Shanhaikwan operated by Manchurians is producing and repairing bridge girders, and bridges. There are also operated by Manchurians small repair-shops at Ningnien, Taian, and Koshan. Under the Manchurian-Soviet joint managements, there are repair-shops at Kwanchengtzu, Mimen, Imenpo, Hengtaohotzu, Mullen, Suifengho, Ante, Angangchi, Chalangtun, Pokotu, Mientuho, and Hailar, but as their conditions are not known, they are not included in the above table.

## INDUSTRY

Table 47  
VEHICLE INDUSTRY (1931)\*—II

	Factories	Capital	Production						Total Value (Yen)	
			Tram Cars (Yen)	Electric Cars (Yen)	Motor Cars (Yen)	Bicycles (Yen)	Horse Carts, Carts (Yen)	Parts (Yen)		
<b>Japanese:</b>										
Port Arthur .....	1	(Gold) 20,000	—	—	2,100	—	—	—	—	2,100
Dairen .....	5	( " ) 30,000	72,859	38,251	27,092	—	5,505	—	—	143,707
Mukden .....	[3]	( " ) [70,000]	—	Motor Car 7,760	—	1,600	—	—	1,000	10,360
Total .....	6	(Gold) 50,000	72,859	46,011	29,192	1,600	5,505	—	1,000	156,167
<b>Manchurian:</b>										
Dairen .....	11	(Gold) 13,000	—	—	3,000	1,128	17,897	2,000	—	24,025
Chinchow .....	1	(Hsiaoyang) 11,000	—	—	—	—	442	3,027	—	3,469
Pitzuwo .....	2	( " ) 5,500	—	—	—	—	13,620	—	—	13,620
Pulantien .....	1	( " ) 19,500	—	—	—	—	—	1,804	—	1,804
Wafangtien .....	2	( " ) 2,000	—	—	—	—	1,316	1,245	—	2,561
Wangchialing .....	2	(Hsienyang) 2,000	—	—	—	—	—	1,102	—	1,102
Mukden .....	2	( " ) 3,700	—	—	4,600	—	3,680	—	—	8,280
Kaiyuan .....	5	( " ) 6,300	—	—	—	—	6,148	—	—	6,148
Ssuningkai .....	1	( " ) 500	—	—	—	—	1,000	1,500	—	2,500
Tsitsihar .....	1	( " ) 500	—	—	—	—	2,035	—	—	2,035
Total .....	28	(Mixed) 64,000	—	—	7,600	1,128	46,138	10,678	—	65,544
Grand Total .....	34	(Mixed) 114,000	72,859	46,011	36,792	2,728	51,643	11,678	221,711	

\* Refer to the notes given on page 362.

In 'Parts' are included pulleys, gears, wheels, axles, and bearings. Vehicles other than horse carts and carts mostly represent repairs.

**Shipbuilding.**—Considering the rapid increase of the trade between Manchoukuo, Japan and other foreign countries, the necessity of developing a shipbuilding industry at such ports as Dairen, Yingkow, Antung or others is undeniable, but actually there are only a few shipbuilding yards which are engaged in repairing ships.

The largest shipbuilding organization in Manchoukuo was the Manchuria Dock Company, operated by the South Manchuria Railway Company. This company was established in 1923 with a capital of ¥2,000,000 to succeed to the Dairen docks and works of the Kawasaki Dockyards, and the dock and works of the former Port Arthur Naval Station.

This company, however, was amalgamated in June, 1931 by the Dairen Steamship Company, an affiliated company of the South Manchuria Railway Company, the capital of which was increased from ¥25,000,000 to ¥25,700,000 by the amalgamation. The repair and construction undertaken by the company during 1931 was valued at ¥1,122,445. Beside this, the Sikoda Shipbuilding Yards (capital 100,000,000 krone) of Czechoslovakia was also famous. But this yard was obliged to suspend operation for some time on account of the unjust oppression by the former military groups. With the establishment of Manchoukuo, it is expected to become active again.

### Ceramic Industry

Manchoukuo is rich in raw materials for the ceramic industry. Limestone, material for making cement, is found in almost unlimited quantities even in the Kwantung Leased Territory alone; silica, material for glass making, is of excellent quality and found in large deposits; fire clay, material for pottery, porcelain, and brick, is also very abundant. Furthermore, magnesite ores, deposit of which is said to be 20,000,000,000 metric tons, are indispensable as fire-proofing material. (Refer to the Chapter on Mining).

The ceramic industry of Manchoukuo is almost restricted to the Kwantung Leased Territory, and the most notable is the cement industry. At present the cement production is more than ¥2,000,000, but with the constructive progress of the new State of Manchoukuo, the industry is making an extremely rapid progress. Also the production of bricks reaches quite a large sum, and the manufacture of glass and special bricks is also regarded very promising because of the abundant supply of excellent materials at hand. But at present, most of such materials are now



Streamlets in the Khingan Range foothills.

being exported to Japan in the crude form, excepting only in the case of cement. The production and foreign trade condition of the ceramic industry of Manchoukuo are as follow :

Table 48  
CERAMIC INDUSTRY STATISTICS (1931)\*

	Factories		Capital (Mixed)	Production (yen)	Total number of day-workmen (in a year)
Glass .....	{ Japanese	5	3,462,000	900,598	118,465
	{ Manchurian	3	2,290	7,906	11,250
	{ Total	8	3,464,290	908,504	129,715
Porcelain .....	{ Japanese	9	719,000	111,596	49,935
	{ Manchurian	[1]			
	{ Total	18	1,214,500	257,269	179,362
Cement .....	{ Japanese	8	7,151,440	2,173,552	334,472
	{ Manchurian	× [1]	—	× [918]	—
	{ Total	8	7,151,440	2,173,552	334,472
Cement Product .....	{ Japanese	5	58,500	20,123	8,585
	{ Manchurian	[2]	3,000	4,070	2,045
	{ Total	7	61,500	24,193	10,630
Brick .....	{ Japanese	34	5,847,912	602,031	Unknown
	{ Manchurian	(8)	1,850,800	585,345	"
	{ Total	(11)	7,698,712	1,187,376	"
Special Brick .....	{ Japanese	9	3,585,000	330,481	183,694
	{ Manchurian	× [1]	—	× 86,715	× 17,483
	{ Total	9	3,585,000	330,481	201,177
Tiles .....	{ Japanese	—	—	—	—
	{ Manchurian	(1)	32,500	14,008	24,484
	{ Total	23	32,500	14,008	24,484
Enamelled Iron Ware...	{ Japanese	—	—	—	—
	{ Manchurian	1	50,000	52,599	6,000
	{ Total	1	50,000	52,599	6,000
Lime .....	{ Japanese	7	756,500	112,924	38,576
	{ Manchurian	[1]	85,000	72,554	67,045
	{ Total	45	841,500	185,478	105,621

\* Refer to the notes given on page 362.

	Factories	Capital (Mixed)	Production (yen)	Total number of day-workmen (in a year)
Graphite Products .....	Japanese	1	—	3,522
	Manchurian	—	—	1,956
	Total	1	—	3,522
Others .....	Japanese	2	45,000	12,064
	Manchurian	[2]	—	—
	Total	2	45,000	12,064
Total.....	Japanese	81	21,625,352	4,354,524
	Manchurian	[8] (9)	2,519,090	882,155
	Total	347 (11)	24,144,442	5,236,679
		428		990,797
		[8] (20)		

Table 49

EXPORTS AND IMPORTS OF PRINCIPAL CERAMIC PRODUCTS  
(in Haikwan taels)

	Imports		Exports	
	1930	1931	1930	1931
Cement .....	345,550	361,604	1,800,417	1,286,908
Lime .....	10,052	5,493	7,114	2,477
Tile and Brick .....	236,166	262,058	119,400	118,121
Glass and Glass Wares .....	784,119	574,196	1,071,833	752,865
Porcelain .....	1,534,716	672,055	26,275	6,649
Enamelled Iron Wares .....	320,821	218,159	74	—

**Glass Manufacture.**—Regarding the glass manufacturing industry of Manchoukuo, it can be said that the South Manchuria Railway Company greatly contributed to make possible the present prosperity of the industry. Formerly glass manufacture in Manchoukuo consisted merely in producing bottles and kerosene lamp chimneys from waste glass. Manchoukuo possesses the necessary materials for glass manufacture, and also is favoured in other respects for this industry. The Ceramic Laboratory of the South Manchuria Railway Company commenced about 1916 research and experiments in producing common soda glass by using materials produced in Manchoukuo. As satisfactory results were obtained, the laboratory further experimented in the manufacture of crucibles, the basic problem of glass manufacture, by testing various different materials and also different shapes of crucibles. Experiments were conducted in producing crys-

tal glass, semi-crystal glass, coloured glass, and hard glass. Final success was attained in 1919 when the Laboratory produced glass-ware that surpassed German or Austrian glass, succeeding in improving the quality of common soda glass.

The laboratory also was able to produce hard glass which is superior to German or Austrian products. Before the Great War, German glass was used for the inner chimney of mine gas safety lamps, the glass and gauge tube of steam boiler water gauges, and surgical, chemical and scientific instruments, but the products of the laboratory came to replace German products in all such uses. In 1928, this section of the Ceramic Laboratory and the glass plant of the Dairen Ceramic Company were amalgamated and thus the South Manchuria Glass Company was established.

The South Manchuria Railway Company attained signal success in producing glass as above-mentioned, but realizing the prospects of plate-glass manufacture, it made a plan in 1924 for erecting a plate-glass plant. After various proposals and plans were discussed, it was finally decided to operate plate-glass manufacture jointly with the Asahi Glass Company of Japan, and thus the Shoko Glass Company was established in 1925. The company has a capacity of 330,000 cases of window-glass per year, and production was commenced in 1925. The annual production value reaches about a million yen, and the company is the largest glass manufacturing establishment in Manchoukuo.

To sum up, although the glass industry of Manchoukuo was backward up to the time of the Great War, it made signal development after the war.

Table 50

IMPORTS AND EXPORTS OF GLASS AND GLASS WARES (1931)

(in Haikwan taels)

	Exports	Imports
Japan .....	368,563	339,108
China .....	255,140	55,733
Dutch Indies .....	114,559	—
Belgium .....	—	64,522
U.S.S.R. ....	—	78,699
Others .....	14,603	36,134
Total .....	752,865	574,196

Table 51  
GLASS INDUSTRY (1931)\*

Factories	Capital	Production							Total Value (Yen)	
		Plate Glass Quantity (Cases)	Value (Yen)	Table (Yen)	Glass Wares Lighting (Yen)	Bottle (Yen)	Acid and Heat Proof (Yen)	Other (Yen)		
<b>Japanese:</b>										
Dairen .....	5 (Gold)	3,462,000	172,000	739,600	84,539	12,476	52,086	9,931	1,966	900,598
<b>Manchurian:</b>										
Mukden.....	2 (Hsienyang)	2,290	—	—	—	1,060	4,000	—	—	5,060
Kaiyuan .....	1 ( " )	...	—	—	—	2,846	—	—	—	2,846
Total.....	3 ( " )	2,290	—	—	—	3,906	4,000	—	—	7,906
<b>Grand Total .....</b>	<b>8 (Mixed)</b>	<b>3,464,290</b>	<b>172,000</b>	<b>739,600</b>	<b>84,539</b>	<b>16,382</b>	<b>56,086</b>	<b>9,931</b>	<b>1,966</b>	<b>908,504</b>

**Pottery Manufacture.**—The production of pottery in Manchoukuo is insufficient to meet the demand, consequently porcelain and pottery are imported mostly from Shanghai, Japan, and other countries, as shown by the following table for 1931:

	Exports (Hk. Tls.)	Imports (Hk. Tls.)	Exports (Hk. Tls.)	Imports (Hk. Tls.)
Japan .....	963	385,135	—	33,884
China .....	5,686	253,036	6,649	672,055
Others .....	—	—	—	—
<b>Total .....</b>	<b>6,649</b>	<b>638,171</b>	<b>6,649</b>	<b>672,055</b>

\* 1. Refer to the notes given on page 362.

2. Besides those mentioned in the above table, there are two factories at Harbin operated by Manchurians, with a total capital of 14,000 Harbin Tayang, and an estimated annual production of 4,400 yen.

Manchoukuo having abundant materials for pottery manufacture, it is regarded as incomprehensible why this industry does not develop. Formerly only water jars and other low grade products were produced, more or less, at Mukden, Changchun, Penhsihu and other places, and pottery production of other kinds is negligible.

But as one example of successful industries brought into existence by the movement to encourage the use of native products may be mentioned the pottery manufacture by the Chaohsing Pottery Co. (肇興窯業公司), with a capital of 480,000 Hsien Tayang yuan. This company was established in 1923, and made gradual progress, installing porcelain kilns in 1928. In 1929, it was greatly aided by the former government of Mukden, and also with the favourable effect of the revised customs tariff, the company has been able to make steady development. The development of this company brought quite a pressure upon Japanese plants, and at present is even threatening to stop the import of pottery and porcelain into Manchoukuo. Besides porcelain, this company produces Chinese tiles, Japanese tiles and cement tiles.

The production of porcelain and pottery in Manchoukuo is as shown in the following table:

Table 52  
PORCELAIN AND POTTERY INDUSTRY\*

Factories	Capital	Production							Total Value (Yen)
		Table, Furnishing Quantity (Pieces)	Value (Yen)	Building Quantity (Pieces)	Value (Yen)	Electric Quantity (Pieces)	Value (Yen)	Pipes Value (Yen)	
<b>Japanese:</b>									
Port Arthur .....	(Gold) 20,000	—	—	60,000	2,100	—	—	—	2,100
Dairen .....	( " ) 669,000	...	17,434	...	12,093	35,849	11,200	2,240	67,616
[1]	[500,000]	—	—	—	—	—	26,148	8,633	8,633
Mukden .....	( " ) ...	—	—	...	17,690	—	—	—	17,690
Fushun .....	( " ) ...	—	—	...	2,710	—	—	—	2,710
Chuantou .....	( " ) ...	—	—	27,784	12,847	—	—	—	12,847
Total .....	(Gold) 719,000	...	17,434	87,784	47,440	35,849	37,348	10,873	111,596
[1]	[1]	...	...	...	...	...	...	...	...
<b>Manchurian:</b>									
Dairen .....	(Gold) { 2,500 (Hsiangyang) { 13,000	10,950	7,735	24,000	1,200	—	21,000	4,200	13,135
Chinchow .....	...	10,720	9,903	15,000	1,500	—	—	—	11,403
Pulantien .....	...	445,000	20,947	—	—	—	—	—	20,947
Mukden .....	(Hsiangyang) 480,000	...	100,188	—	—	—	—	—	100,188
Total .....	(Mixed) 495,500	465,770	138,773	39,000	2,700	—	21,000	4,200	145,673
Grand Total .....	(Mixed) 1,214,500	465,770	156,207	126,784	50,140	35,849	58,348	15,073	257,269
[1]	[1]	...	...	...	...	...	...	...	...

\* Refer to the notes given on page 362.

**Cement Manufacture.**—Soon after the close of the Russo-Japanese War, civil engineering and building construction suddenly became active in Manchuria, and a great demand was created for the various kinds of materials required. Cement was one of them, but at that time the cement manufacturing industry had not yet developed in Manchuria, and in consequence the supply had to be obtained from foreign countries.

The Kwantung Leased Territory is rich in deposits of lime-stone and clay, the raw materials for cement manufacture, and as labour cost is low, naturally many Japanese business men made plans to start this branch of industry. In 1908, the Choushuitzu (周水子) factory of the Onoda (小野田) Cement Company was established with a capital of ¥6,000,000, and although at first the factory had a yearly capacity of only 250,000 barrels, its equipment was gradually increased and improved, and it has made notable development in recent years as shown in Note (2) of the following table.

There is also the Mukden Lime-stone and Cement Company, established at Mukden in 1919 with a capital of ¥500,000 invested by Japanese. At one time the company produced 21,000 metric tons of cement a year, but recently it has only engaged in the production of lime and suspending its cement production.

As Manchuria produces much zechstein, an ingredient of silicate cement, a silicate cement company was established by Japanese at Dairen with a capital of ¥60,000, which was renamed the Dairen Dolomite Industrial Company in 1919. The product of this company is superior in quality and suitable for the same purposes as white Portland cement, being found particularly adaptable for various artificial stones and finishing work.

The cement production in Manchoukuo in 1931 is given in the following table, but besides those there is produced ¥20,000 to ¥30,000 of cement tiles, cement pipes, and other cement products.



Table 53  
CEMENT INDUSTRY\*

Factories	Capital	Production					Total Value (Yen)
		Portland Cement (Metric tons)	Magnesia Cement (Metric tons)	Dolomitic Cement (Metric tons)	Clinker Cement (Bags)	Cement (Yen)	
<b>Japanese:</b>							
Dairen .....	(Gold) 7,045,440	157,472	2,618	115,309	6,691	106,915	2,111,892
Tashihchiao .....	( " ) { 106,000 (37,500)	—	3,083	61,660	—	—	61,660
Total .....	( " ) 7,151,440	157,472	1,889,668	176,969	6,691	106,915	2,173,552
<b>Manchurian-Japanese:</b>							
Penhsihu .....	[1] (Tayang) [7,000,000]	—	—	—	—	—	918
<b>Grand Total .....</b>	<b>[1] 7,151,440</b>	<b>157,472</b>	<b>1,889,668</b>	<b>5,701</b>	<b>176,969</b>	<b>106,915</b>	<b>918</b>
							<b>2,174,470</b>

\* (1) Refer to the notes given on page 362.  
Figures for Penhsihu represent conditions in 1931.

(2) CHOUSHUITZU FACTORY OF ONODA CEMENT CO.

Capital .....	¥31,000,000 (¥19,475,000 paid-up)
Annual Capacity .....	1,500,000 barrels (255,000 metric tons)
	1926 107,510 metric tons
	1927 112,442 " "
	1928 151,669 " "
	1929 206,625 " "
	1930 194,508 " "
	1931 154,019 " "
Annual Production .....	

The capital mentioned above is the total capital of the Onoda Cement Company, and the investment in the Choushuitzu factory is said to be about ¥6,500,000.

The cement production in Manchoukuo reaches quite a large quantity, but the country still imports a large quantity of foreign cement, mostly from Japan and China, as shown in the following table:

	Quantity (Metric tons)	Value (Hk. Tls.)
1927 .....	29,361	506,383
1928 .....	19,898	414,407
1929 .....	33,338	569,000
1930 .....	18,059	345,550
1931 .....	18,156	361,604
{ Japan .....	8,598	212,167
{ China .....	9,252	141,632
{ Others .....	306	7,805

The demand for cement in Manchoukuo rapidly increased with the progress of various economic construction programmes, following the establishment of the new State, and thus Japanese cement producers came to consider plans for producing cement in Manchoukuo. Among various reports, the most reliable ones are of the Manchuria Cement Company, and the Daido Cement Company. The former is to be formed with a capital of ¥5,000,000 Manchoukuo currency (¥2,500,000 paid-up) and to erect a mill in the suburb of Liaoyang to produce 180,000 metric tons of cement annually. The latter is to be formed with a capital of ¥3,000,000 (fully paid-up), to complete its mills and other equipments during next year mainly for producing high grade cement and to start operations from 1935.

**Brick Manufacture.**—The production condition of bricks in Manchoukuo is not clearly known, but there are about 350 principal brick factories with a total annual production worth about ¥1,600,000. Thus those factories are mostly on a small scale, excepting only one or two, it may be considered. The important destination and source of bricks in foreign trade is Japan. Figures for the foreign trade of bricks in 1931 are as follows:

	Exports (Hk. Tls.)	Imports (Hk. Tls.)
Japan .....	117,999	257,686
China .....	122	2,904
Others .....	—	1,468
Total .....	118,121	262,058

**Ordinary Bricks.**—Ordinary bricks produced in Manchoukuo are divided into black bricks and red bricks. The former is produced under small scale production system, being a product of the so-called hand or household industry, and it is mainly supplied to rural districts. The latter is supplied

to urban districts. That black bricks have been produced since quite early days is proved by the use of black bricks in the construction of the Great Wall of China which was built in 414 B.C. It was since the advance of Russia into Manchuria that the use of red bricks became popular in the territory, and it has been most extensively used since various enterprises have been undertaken in the country by Japanese.

The industry of producing common bricks had been making steady development and reached its highest prosperity in the autumn of 1919 when the number of plants greatly increased. After the panic of 1920, the industry was much depressed, and most plants were obliged to suspend production. However, Manchoukuo is rich in the supply of clay, and the demand for bricks and tiles is steadily increasing as the construction of factories and other buildings and various civil engineering works has increased. The use of Japanese type tiles is increasing among Manchurians. In 1931, the production of ordinary bricks reached about ¥1,200,000 in value.

**Special Bricks.—Fire-brick**—Manchoukuo is rich in fire-clay, silica, magnesite, and fireproofing materials. At present factories producing fire-brick using these materials number 11 in all, being established at Dairen, Port Arthur, Pulantien, Anshan, Penhsihu, Fushun, and other places, with a total capital of ¥3,580,300, not including the capital of the fire-brick factory of the Penhsihu Colliery and Iron Works. Of these eleven factories, one that engages exclusively in the production and sale of fire-brick is the Dairen Ceramic Company; the others are producing fire-brick merely as a side-product.

The Dairen Ceramic Company was established in 1925 by succeeding to the pottery section of the Ceramic Laboratory of the South Manchuria Railway Company, and its present capital is ¥1,200,000 while the annual production capacity is 15,000 metric tons. The company is not only controlling the fire-brick industry of Manchuria, but also is exercising quite an influence in the fire-brick market of Japan.

In joining fire-bricks special mortar is required as common cement mortar will easily dissolve when heated to high temperature. Therefore at all fire-brick factories at Fushun, Anshan, and Dairen is produced special fire-mortar. But the total production of this special mortar is very small, being worth only about ¥30,000 a year.

**Hollow-brick**—Hollow-brick is hollow inside and used in laying ceilings, floors, partition walls and outer walls. The process of its manufacture is almost same as that of ordinary bricks.

Factories making hollow-bricks in Manchoukuo are the Yingkow

Brick Works (has a factory at Dairen; production capacity 1,200,000 bricks), and the Tairiku Ceramic Company (has factories at Dairen and Fushun: production capacity 600,000 bricks).

**Ornamental Bricks**—Ornamental bricks are used for decorative purposes inside and outside buildings, and are of the natural colour of clay, or purposely coloured, or speckled to appear like various kinds of stone, or glazed. Producers of this kind of brick in Manchoukuo are the Yingkow Brick Works, and the Nishizaka Brick Factory, but the latter is of a very small scale.

**Hard Bricks**—Hard bricks are bricks of special hardness and fine texture used generally for paving roads, and thus are often called paving bricks. They are produced in Manchoukuo only by the Yingkow Brick Works which has a capacity of producing 1,000,000 bricks of this kind in one year. As the material for this brick, the clay produced in Fuchou is used.

**Reinforced Brick**—This is a special brick made with a hole about 2 inches in diameter for passing iron rods in constructing fire and earthquake proof structures. This kind of brick is made only at the Yingkow Brick Works.

**Clinker Brick**—This brick is made by utilizing the clinker produced at pig-iron furnaces. At present it is made at the Ceramic Factory of the Penhsihu Colliery and Iron Works only. There are also bricks made of coal cinders, and acid-proof brick made at the Anshan Iron Works, but they will not be explained in detail here.

### Comestible and Brewing Industry

The flour industry and the kaoliang-chiu distilling industry are two of the three greatest industries of Manchoukuo, the other being the oil extraction industry. But respecting these two industries, statistics are imperfect, and it is difficult to grasp their general condition.

The outline of the comestible industry and brewing industry of Manchoukuo may be shown as follows:

Table 54  
COMESTIBLE INDUSTRY AND BREWING INDUSTRY

	Factories	Capital (Mixed)	Production (Yen)	Total number of day-workmen (in a year)
Comestible:				
	Japanese (3)	6,700,000	—	—
Flour.....	43 Manchurian (2)	15,139,904	17,478,343	16,341
	43 Total (5)	21,839,904	17,478,343	16,341

	Factories	Capital (Mixed)	Production (Yen)	Total number of day-workmen (in a year)
Cereal Refining .....	Japanese (3)	2,043,100	5,874,911	238,313
	Manchurian (2)	779,479	1,268,885	111,082
	Total (5)	2,822,579	7,143,796	349,395
Cereal Selection .....	Japanese (3)	75,800	82,300	290,763
	Manchurian (1)	—	—	—
	Total (4)	75,800	82,300	290,763
Ajinomoto, Starch ...	Japanese (2)	350,000	456,245	26,182
	Manchurian (—)	—	—	—
	Total (2)	350,000	456,245	26,182
Canning .....	Japanese (1)	40,000	21,245	2,880
	Manchurian (1)	300	920	960
	Total (2)	40,300	22,165	3,840
Ice, Non-alcoholic Beverages .....	Japanese (10)	1,730,000	372,387	43,615
	Manchurian (6)	19,130	25,734	8,900
	Total (16)	1,743,130	398,121	52,515
Aquatic Products .....	Japanese (2)	5,000	42,788	3,280
	Manchurian (—)	—	—	—
	Total (2)	5,000	42,788	3,280
Tobacco .....	Japanese (7)	7,579,000	8,428,030	178,198
	Manchurian (4)	28,000	9,109,665	unknown
	Total (10)	*9,512,000	15,861,010	unknown
Total .....	Japanese (74)	18,522,900	15,277,906	783,231
	Manchurian (116)	25,478,813	28,042,157	137,283
	Total (190)	44,001,713	43,320,063	920,514
<b>Brewing :</b>	Japanese (17)	1,019,948	803,190	64,942
Miso, Shoyu .....	Manchurian (2)	198,300	151,809	62,197
	Total (2)	1,218,248	954,999	127,139
	Japanese (18)	580,000	739,741	82,460
Alcoholic Beverages...	Manchurian (55)	1,430,180	1,094,579	185,390
	Total (73)	2,010,180	1,834,320	267,850
	Japanese (5)	1,599,948	1,542,931	147,402
Total .....	Manchurian (82)	1,628,480	1,246,388	247,589
	Total (117)	3,228,428	2,789,319	394,989
	Japanese (5)	—	—	—
				[4]

\* indicates foreign capitals.

	Factories	Capital (Mixed)	Production (Yen)	Total number of day-workmen (in a year)
Grand Total .....	Japanese (109)	20,122,848	16,820,837	930,633
	Manchurian (198)	27,107,293	29,288,545	384,870
	Grand Total (307)	47,230,141	46,109,382	1,315,503
				[4]

**Comestible Industry**

**Flour Milling Industry.**—In the flour milling plants of Manchoukuo there are the old-fashioned Mafang (磨房), and the modern Huofang (火房). The former belongs to the household industry and has been conducted by native capital since early times, and its scale is very small. In the old days, the entire demand of the native population was supplied by the products of these old-fashioned Mafang, but also they are still found all over Manchoukuo even today, and are occupying an important position in the flour milling industry of the country. The latter, or the modern Huofang, belongs to the modern factory industry, and is a milling factory using large scale modern machinery. These modern Huofang milling industries developed after the eastern advance of the Russians into the territory.

The milling industry of Manchoukuo will be viewed by dividing it into the industry operated in North Manchuria, particularly at Harbin, and in South Manchuria.

**Flour Milling in North Manchuria** (especially at Harbin).—The flour milling industry is prosperous in North Manchuria as wheat is produced in a greater quantity in the northern than in the southern part of the country, and Harbin is the centre of the industry. At the beginning of 1900, a flour milling company (capital 384,000 roubles, daily production capacity 49,140 kilogrammes) under Russian management was established at Harbin. In the succeeding thirty years the industry has had many ups and downs.

The period from 1900 to 1903 was the growing period of the Harbin flour milling industry, and in this period there appeared eight flour milling companies in North Manchuria. In 1904, the Russo-Japanese War broke out and Russian troops were despatched in great numbers to the Far East, so the supply of wheat flour to these troops gave a great stimulus

to the industry. When the war ended in the defeat of Russia in 1905, the majority of the consumers left the territory and the industry suffered greatly, the depression continuing until 1908.

The period from 1908 to 1915 was the revival period of the industry. The flour producers opened up new markets in the Siberian Littoral Province and Heilungkiang districts, and the entrance of numerous Chinese workers for railway construction, increased wheat production, and the protection policy adopted by the North Manchuria Railway, also helped to revive the industry. But the abolition of the free port system at Vladivostok in 1909, and the cancellation of the 50 versts free trade system on the Sino-Russian border in 1913 caused unfavourable effects.

The industry became quite active in the period from 1916 to 1918 because of the effect of the Great War, as shipments to Russian territory increased, allied troops were sent to Siberia, and the number of immigrants increased. From 1919 to 1926 the industry was seriously depressed on account of the Russian revolution, the post-war world financial panic, the poor wheat crop, reckless competition caused by excessively numerous mills, and the coming of American flour; mills went bankrupt one after another, leaving only twelve mills which were operated to supply local needs.

After 1927, the industry again became active and profitable. The first of the causes of this revival was that the depression of the previous eight years had naturally eliminated unsound establishments and prompted the better plants to improve their equipment. Among other causes of this revival may be mentioned the increased wheat production in recent years, the increased flour consumption due to the population increase along the North Manchuria Railway and in interior districts, and the nonpresence of competing foreign flour in North Manchuria. It is also to be noted that for the protection of the flour mills at Harbin, the North Manchuria Railway has collected somewhat high freight rates on wheat to prevent its shipment to other districts, and to promote the sale of flour in the southern districts.

The features of the flour milling industry in North Manchuria are that although the industry was at first established by Russians, it came to be almost entirely operated by Manchurians later, and that the equipments and managements of mills are widely diverse. The reason the industry has come to be almost monopolized by Manchurians is that being quick to grasp business opportunities, they are very skilful in purchasing wheat and in selling their products, and also they are superior in managing the mill

where expense retrenchment is of the first importance as the process of production is comparatively simple and the profit rate is low. Russian operators of mills have the disadvantage that while their investment capital and expenditure are mostly in gold roubles, their daily purchases and sales have to be done in locally circulated currencies. Thus when the currency fluctuation was great, it gave much opportunity for business activities for Manchurians while it increased the percentage of risks to Russians. The constant wide fluctuation of the price of wheat is the greatest handicap of flour mill operators, and as the causes for fluctuations are complicated, it is very difficult to forecast the future development. It was for these reasons that the Russian operators failed.

Recently the profitableness of the flour milling industry at Harbin has been recognized, and the wheat produced in North Manchuria is sufficient to supply the material for the industry, and therefore, it is not at all easy for foreign flour to enter the markets at Harbin.

*Flour Milling in South Manchuria.*—When there were no flour mills in South Manchuria, the supply chiefly consisted of American and Shanghai flours. But as mills were gradually established and North Manchurian flour appeared in South Manchurian markets, American and Shanghai flours were gradually driven out of Manchuria, excepting only the southern corner of the country. Although Manchurian wheat once was exported to Europe, the wheat crop in 1921 was extremely small, and as the wheat price rose, American flour again found a market in northern districts of South Manchuria. In 1923, the import of American flour reached a very large quantity as shown in the following table.

The development of the flour industry in South Manchuria was made during the Great War, taking advantage of the fact that neither North Manchurian flour nor foreign flour was available for South Manchuria. So the development was in some sense unnatural, and when the wheat crop was poor for several years and the financial depression continued, most of the mills in South Manchuria suspended production. As the industry became depressed, the mill operators cooperated to meet the situation, and the South Manchuria Railway freight rate on imported wheat was lowered, so that they barely managed to continue operation. But the revival was short-lived, and soon the industry was oppressed by the coming of cheap foreign flour.

In recent years, the import of wheat flour has annually increased, but this is partially due also to the fact that the wheat production in Manchuria could not meet the steadily expanding demand (respecting the produc-

tion of wheat, refer to the Chapter on Agriculture.) The import of wheat flour at the three ports of South Manchuria in recent years reaches a large figure, as shown in the following.

While thus the wheat flour demand in South Manchuria is annually increasing, there are only five mills at Hsinking. The shortage of wheat in South Manchuria, the lack of funds due to the depressed business results in the past several years, and the competition with foreign flour, are said to be the principal causes that have prevented the expansion of the industry in South Manchuria.

Table 55

## PRODUCTION OF FLOUR MILLING INDUSTRY (1931)\*

	Factories	Capital	Production	
			Quantity (Metric tons)	Value (Yen)
<b>Japanese :</b>				
Tiehling.....	(1)	Gold (5,700,000)	—	—
Kaiyuan.....	(1)	" 1,000,000	—	—
Hsinking .....	(1)	" 5,700,000	—	—
Total .....	(3)	" 6,700,000	—	—
<b>Manchurian :</b>				
South Manchuria : Hsinking...	3	Hsienyang 900,000	16,105	1,117,343
	(1)	Hsiaopiao 400,000	—	—
Kirin .....	(1)	Hsienyang 330,000	—	—
		Gold 350,000	—	—
		Hsienyang 7,750,000	141,172	10,024,000
North Manchuria : Harbin ...	23	Manchoukuo yuan 3,248,000	—	—
		Kiangtieh 10,000,000	—	—
Districts along N.M. Railway.....	8	Hsienyang 1,500,000	33,262	2,362,000
		Kiangtieh 10,000,000	—	—
Other Northern Districts.	9	Hsienyang 650,000	55,984	3,975,000
Total .....	43	Mixed 15,139,904	246,523	17,478,343
	(2)			
<b>Grand Total .....</b>	<b>43</b>	<b>Mixed 21,839,904</b>	<b>246,523</b>	<b>17,478,343</b>
	(5)			

\* Refer to the notes given on page 362.

Among mills at Harbin operated by Manchurians are included 3 conducted by French capital, with a total capital of ¥350,000.

The above table gives the statistics for modern flour mills, and besides these there are numerous old-fashioned Mafang. According to the statistics for 1929, these old-fashioned Mafang mills were 190 at Petuna, 150 at Shuangchengpo, 40 at Ashihho, 20 at Pingkiang (Fuchiatien), 300 at Hulan, 25 at Sansing 90 Suihwa, 100 at Tsitsihar, 55 at Payen, and others. But the total production of these old-fashioned mills is considered to be less than one-third of the total annual production of the modern mills.

Table 56  
IMPORTS OF WHEAT FLOUR

	Quantity (Metric Tons)	Value (Hk. Tls.)
1929 .....	274,465	23,348,207
1930 .....	206,286	18,432,183
1931 .....	186,304	16,178,265
Japan .....	46,710	4,911,626
China .....	115,200	8,795,585
U.S.A.....	23,321	2,362,083
Others.....	1,073	108,971

**Sugar Industry.**—Manchoukuo is, at present, annually importing 70,000 to 80,000 metric tons of sugar, and the import quantity is regarded as the consumption amount of sugar in the country. Thus there is no significant sugar manufacturing industry. Imported sugars are mainly Japanese and Hongkong sugar, although there are also imported Chinese brown sugar, and Java sugar.

Table 57  
IMPORTS OF SUGAR

	Quantity (Metric Tons)	Value (Hk. Tls.)
1929 .....	86,018	9,994,095
1930 .....	82,230	10,426,636
1931 .....	67,039	8,819,448
Japan .....	45,510	5,981,237
China .....	427	57,402
Hong Kong .....	15,329	1,805,454
U.S.S.R. ....	4,937	890,332
Others.....	836	85,023

The sugar demand in Manchoukuo is almost entirely supplied by imported goods, as above-mentioned, but there is some hope for the future development of the sugar industry as the climate and soil of Manchoukuo are favourable for the cultivation of sugar beets. In North Manchuria, the sugar industry using sugar beets as material was started by Russians and Chinese in quite early days. That is to say, the Ashihho Sugar Mill was established by Poles in 1909, with 1,000,000 roubles of Russian capital, and later it became the possession of Frenchmen. Since 1929, the mill did not prosper due to financial depression, and suspended operation, and became the property of the National City Bank of New York for the settlement of debts.

Recently a certain Jewish merchant of Harbin leased the mill from the

bank for three years, and resumed operation since the end of 1932. Then there is also the Hulan Sugar Mill operated by Chinese, established in 1909; later it was operated by the old government, but this is now suspending operation due to unsatisfactory business condition.

In the southern part of Manchoukuo, the South Manchuria Railway Company's Agricultural Experiment Station in 1914 started experiments extending over three years in the cultivation of sugar beets. As the prospect of the beet sugar industry was found favourable, the South Manchuria Sugar Company was established at Mukden with a capital of ¥10,000,000 in 1916 by several Japanese business men. The company had sugar beets cultivated by Chinese farmers under contract and the mills were operated from December, 1916. The production was 12,000 metric tons for the first year of production, but stimulated by the expansion of the market, the production was increased to 18,000 metric tons in 1922, when a branch mill was opened in Tiehling. But due to the business depression, the company was obliged to suspend operation from 1927.

With the increase in the import duty on sugar effected in 1930 according to the revision of import tariffs following the acquisition of customs autonomy by China, a movement to revive the operations of the company was proposed, but its materialization is believed difficult.

In short, although Manchoukuo is not necessarily unfavourably situated in respect of the supply of raw materials for sugar refining, it is considered that the industry may not develop there under ordinary methods, in view of the fairly keen international sugar competition.

**Tobacco Industry.**—Tobacco consumed in Manchoukuo at present is the native cut tobacco and cigarettes. Of cigarettes, low grade ones constitute the largest quantity consumed and the high grade cigarette is only limitedly consumed. The native species of tobacco has been cultivated in Manchuria since very early days, and the main producing districts are the mountain zone of the eastern part of Fengtien Province, Kirin Province, and a part of Heilungkiang Province. The annual tobacco leaf production is believed to be more than 30,000,000 kilogrammes, but the quality is generally very poor, possessing a certain strange smell. Thus the native leaf is not fit for the taste of Japanese or Western people, and is only used as cut tobaccos for the pipes of Manchurians. The native leaf tobacco is exported to Tientsin and Chefoo districts, via Dairen and Newchwang, to the extent of about 300,000 kilogrammes a year.

Formerly the tobacco consumed in Manchoukuo was almost entirely cut tobacco, but since the import of Japanese and other foreign cigarettes

was commenced about the Russo-Japanese War, cigarette consumption has been gradually popularized. Prior to the Russo-Japanese War, there was only the British-American Tobacco Trust or the present British-American Tobacco Company in Manchuria as the only cigarette manufacturing company. This company established factories at Mukden and Shanghai within ten years extending before and after the Russo-Japanese War, and not only secured the control of the tobacco market of China, but also placed Manchuria and Korea under its influence. But in 1906, Japanese tobacco manufacturers got together and formed the Toa Tobacco Company for the object of exporting Japanese tobacco products to Korea, Manchuria and China. As the Japanese company became active in Manchuria, it confronted the British-American Tobacco Company in the Manchurian market. Then at Harbin, there were the Robert Company and the Chiulin Company which produced since early days the Russian style cigarettes with mouthpieces. Later, with the increase of the cigarette consumption in Manchuria and the movement against foreign goods, there appeared various tobacco companies in the country, and a keen cigarette war started.

To describe the markets controlled by various different cigarette manufacturing companies, at present, in South Manchuria, the British-American Tobacco Company, and the Toa Tobacco Company and various smaller companies are competing; in North Manchuria, the British-American Tobacco Company, the Toa Tobacco Company, and the Nanyang Brothers Company are dividing the field.

The condition of various tobacco companies in Manchoukuo will be briefly explained.

*British-American Tobacco Company.*—This is an enterprise of British management. The main office is at London, and its factories in the Orient are located at Shanghai, Hankow, Tientsin, and Tsingtao.

Formerly the company monopolized the cigarette trade of Manchuria, but as the Toa Tobacco Company started competition by offering low grade cigarettes after the Russo-Japanese War, it could not hold its monopoly in South Manchuria, and commenced operations in North Manchuria. The better grades of cigarettes consumed in Manchuria are almost entirely the monopoly of the British-American Tobacco Company. But in the market for lower grade cigarettes, it may be more nearly correct to say that the company has become unable to hold the monopolizing position because of the greater increase in demand, rather than that its markets were encroached upon by the Toa Tobacco Company.

The British-American Tobacco Company is the leader among the industrial and commercial enterprises operated by foreigners in Manchoukuo and China, and has always attempted to extend its influence by means of its huge capital and its command of markets, whenever opportunities appeared in any part of Manchoukuo, and has managed to control the tobacco trade of Manchoukuo either by cooperation or by amalgamation.

In recent years, it is confronting extreme financial difficulty because of the unprecedented fall of silver. That is to say, from about December, 1930, the company was obliged to raise the wholesale prices of cigarettes, and its sales in Manchuria became somewhat smaller due to the advance of low grade cigarettes made in South China. Then in order to revive its business, the British-American Tobacco Company came together with the Robert Tobacco Company and also the Yungtaiho (永泰和) Company which were formerly under the financial control of that company, were separated and made its agents.

*Toa Tobacco Company.*—This company was formed in 1906 when the Tobacco Monopoly of the Japanese Government was established, with a capital of ¥1,000,000 for the purpose of exporting Japanese cigarettes to Korea and China. At first, it monopolized the cigarette trade of Korea, and gradually increasing its capital, to ¥10,000,000 in 1919, it attempted to commence business in Manchuria, Siberia, and China. Soon afterwards, the monopoly system was adopted in Korea, and trade with Russia became suspended. The company was then obliged to devote its entire attention to Manchuria and China. The company maintains its main office at Tokyo, a branch office at Mukden and sales offices at various points. In manufacturing technique and in sales plans, it is far behind the British-American Tobacco Company, and has often been oppressed by that trust and other foreign makers. The company's factories are at Mukden, Yingkow, Tientsin, Shanghai and other places, and its sales results are generally satisfactory.

*Chiulin Company.*—The Chiulin Company of Russia was opened as a small shop at Nikolaevsk in 1867, and although it made steady progress, its foundation was entirely wiped out by the effects of the European War and the Russian revolution. The company is now operating at Harbin as its only base of activity.

Formerly the company's long experience and reputation made it impossible for the British-American Tobacco Company and the Toa Tobacco Company to sell their products to Russians, and also closed the

market to the products of Chinese makers. But at present, the situation has been reversed, and now the company comes only after the Robert Tobacco Company.

*Robert Tobacco Company.*—Until 1913, this was only a small plant producing Russian cigarettes, operated by an individual, and its business results were unfavourable. In 1913, however, it obtained an investment of ¥8,000,000 from the British-American Tobacco Company and its affairs were adjusted and revived. Since that time, it has been a great influence in the cigarette industry in North Manchuria.

*Nanyang Brothers Company.*—The Nanyang Brothers Company is a tobacco company having its headquarters at Canton, but particulars about it are unknown. Manufacturing cigarettes with the native tobacco leaf produced in Southern China, the company attempted to develop its markets by utilizing the anti-foreign sentiments of the Chinese people, and declaring the need of consuming domestic products, and it entered the field of Manchuria in 1914. Because the company was not favoured geographically, it suffered vicissitudes in Manchuria, and at present its business condition is quite depressed.

The demand for tobacco is yearly showing an increasing tendency in Manchoukuo, and the tobacco industry is believed to be very promising when viewed from the standpoint of consumption. But materials for making cigarettes are almost entirely American leaves, and almost the entire supply of leaf tobacco is secured from foreign countries (Japan and the U. S. A.). Besides the cigarettes produced in the country, there is an import of quite a large amount of foreign cigarettes.

Table 58  
TOBACCO INDUSTRY (1931)\*

	Factories	Capital	Production		Value (Yen)
			Quantity (Bales)	(Kg.)	
<b>Japanese:</b>					
Dairen .....	2	(Gold) 10,000 (7,500,000)	2,816	—	112,993
Mukden .....	3	{(Gold) 34,000 { " ) (7,500,000) { (Hsienyang) 35,000 (unknown 1)	91,395	—	4,877,813
Yingkow .....	2	(Gold) 7,500,000	58,507	120,000	3,437,224
Total .....	7	(Mixed) 7,579,000	152,718	120,000	8,428,030

\* Refer to the notes given on page 362.

Investigation of the Manchurian and foreign factories being not yet completed, the figures for 1930 are given according to the Industrial Statistics of 1930.

	Factories	Capital	Production		
			(Bales)	Quantity (Kg.)	Value (Yen)
<b>Manchurian :</b>					
Mukden .....	3	Hsientayang 28,000	3,900	—	158,610
<b>Foreign :</b>					
<b>British</b>					
Mukden .....	1	Hsienyang, 8,000,000	90,000	—	7,938,315
Harbin.....	1	Gold 1,500,000	49,000	—	490,000
<b>Russian</b>					
Mukden .....	1	Gold 12,000	500	—	21,350
Harbin .....	1	Rouble (21,000,000)	11,000	—	660,000
Total .....	4	Mixed 9,512,000	150,500	—	9,109,665
<b>Grand Total...</b>	<b>14</b>	<b>Mixed 17,119,000</b>	<b>307,118</b>	<b>120,000</b>	<b>17,696,305</b>

Table 59

IMPORTS OF TOBACCO AT THREE SOUTH MANCHURIAN PORTS  
(in Hk. Tls.)

	Cigarettes & Cigars	Leaf Tobacco	Other Tobacco	Total
1929 .....	12,516,736	2,928,767	98,054	15,543,557
1930 .....	13,146,317	3,034,472	62,382	16,243,171
1931 .....	4,126,493	3,492,402	251,530	7,870,425
Japan .....	62,260	590,593	53,012	705,865
Great Britain .....	367,787	—	2,964	370,751
U. S. A. ....	25,860	359,598	27,841	413,299
China .....	3,601,787	2,524,498	165,263	6,291,548
Others .....	68,799	17,713	2,450	88,962

### Distilling and Brewing Industry

**Chinese Spirit (Kaoliang-chiu).**—Of Chinese spirits distilled in Manchoukuo there are Kaoliang-chiu and Huang-chiu, but the most important is kaoliang-chiu. Kaoliang-chiu is made of kaoliang, one of the most important staple products of Manchoukuo, and generally contains 60 to 65 per cent of alcohol. It is also called Paichiu (白酒) or Yinchiu (銀酒) or silver wine literary, as it is colourless and transparent, and also it possesses a particular flavour that suits the taste of Manchurians. The kaoliang-chiu distilling industry constitutes an important household in-

The production amounts for 1929 and 1930 are given by revising the figures given in the Industrial Statistics of 1930.

The content of one bale differs according to the kind of cigarettes; there are several kinds of bale, containing 10,000, 20,000, 25,000, 30,000 or 50,000 cigarettes in each.

dustry of Manchoukuo, and is counted as one of the three important industries of the country, the other two being oil extracting and flour milling. It is produced in even the remotest districts of the country, and it is the most widely operated industry.

The origin of kaoliang-chiu seems to be quite old, and it was between the end of the 17th and the middle of the 18th century that it became a common beverage of the people and its distilling developed as a distinct industry. Since then the increase of population and the increased harvest of kaoliang due to the expansion of the planted area, have served to develop the industry, as it is shown today. Shaokuo (燒鍋) or kaoliang-chiu distilleries mostly also engage in conducting the cereal wholesale business and bean mills, and financially they are generally very influential, formerly acting as banking centres of the villages by issuing Ssutich or private notes. The fact that these distilleries performed formerly a very important part in the economic development of cities and towns, cannot be overlooked in the history of the economic development of Manchoukuo.

It is extremely difficult to obtain or even estimate exactly the number of Shaokuo or the total production in Manchoukuo. As already mentioned, these distilleries are found not only in the districts along the South Manchuria Railway lines which constitute the centres of the Manchurian civilization, but also in the remotest interior districts; thus they are found wherever there are inhabitants. But calculating from the estimated consumption in Manchoukuo and the quantity actually shipped out, it may be said that the annual production of kaoliang-chiu is 40,000 kilolitres.

The most famous kaoliang-chiu producing district is Liaoyang. Liaoyang has an abundant supply of water of excellent quality and also other favourable conditions for distilling kaoliang-chiu; thus kaoliang-chiu produced at Liaoyang is said to have the best taste and flavour among all the spirits produced in the country. Shaokuo in both North and South Manchuria are entirely operated under partnership system or individual management. Shaokuo generally has a sales section to undertake wholesale business within its compound, but for conducting retail business, it is customary to open retail shops known as Chiuchu (酒局). It is not a very favourable enterprise as an investment by Manchurians, but its advantages are that no difficulty is confronted in selling its product, and that the uncollected sales amount is comparatively small.

The method of distilling kaoliang-chiu has not shown any progress or improvement since the beginning of its history in Manchuria, and there was not much expectation of improvement of the management of the in-



dustry. But with the increase of population and the greater production of its raw material, it is expected to make progress in the future. Only in recent years, the sales and export have decreased due to the low silver quotation, as in the case of other industries, and all shaokuo are finding it difficult to operate their business and are restricting their production.

**Other Liquors.**—Although the demand for Japanese saké has yearly increased due to the expansion of the Japanese population, the bulk of the supply (about 2/3 of the total consumption) comes from Japan proper. There were many Japanese who tried the brewing of saké in Manchuria, but they all showed poor results, as the climate and water of Manchuria are inferior for saké brewing, they found it difficult to obtain the materials for saké casks, and moreover the consumers are limited almost entirely to Japanese.

The rise of the European style alcohol industry in North Manchuria took place after the construction of the Chinese Eastern Railway, as in the case of the wheat flour milling industry, and its foundation was laid by Russian businessmen. Although more than thirty years have passed since its beginning, no significant development has been seen up to the present.

The greatest market for the alcohol produced in North Manchuria was originally Far Eastern Russia, but the U.S.S.R. enforced the prohibition law throughout the entire territory in 1922, and consequently the industry suddenly came to have surplus production; that was the greatest blow to the alcohol factories of North Manchuria. Extremely high and unequal taxes were their second blow.

The surplus production, and the extreme and unequal taxation made the principal alcohol factories feel the necessity of establishing their central control organ in order to protect their mutual interest, and a syndicate was formed in the name of the Manchuria Distilling Company in 1923, for restricting production and controlling the sale. After various changes, it is planned to reorganize and expand the syndicate organization. The total sales amount of the syndicate at present is about 3,000 kilolitres, and the main consuming district is Harbin, while its sale is extended also to the districts along the North Manchuria Railway lines and the Sungari River districts, and a small amount is shipped to South Manchuria districts.

In North Manchuria, in Harbin and surrounding districts are many factories producing vodka, liqueurs, and other alcoholic beverages. Such are, however, operated mostly with small capital and are small factories

with simple equipments. Vodka is a mixture of 40 to 50% of pure alcohol and 50 to 60% of pure water, and its production is generally operated as a subsidiary business of alcohol factories. The vodka production in North Manchuria varies considerably according to years, but averages about 1,200 kilolitres, majority of which is produced at Harbin and neighbourhood.

Table 69

## EXPORTS OF CHINESE SPIRIT (KAOLIANG-CHIU) THROUGH PORTS OF DAIREN, ANTUNG, YINGKOW AND HARBIN

	Quantity (Metric Tons)	Value (Hk. Tls.)
1929 .....	5,499	1,124,631
1930 .....	5,468	1,201,360
1931 .....	4,206	966,300
{ Japan .....	121	27,306
{ China .....	4,078	937,686
{ Others .....	7	1,308

Table 61  
PRODUCTION OF ALCOHOLIC BEVERAGES (1931)\*

Factories	Capital	Production					
		Japanese		Chinese		Others	
		Quantity (kl.)	Value (Yen)	Quantity (kl.)	Value (Yen)	Quantity (kl.)	Value (Yen)
<b>Japanese:</b>							
Port Arthur.....	(Gold)	2.17	70,375	—	—	—	—
Dairen.....	( " )	3.79	96,720	9	1,500	18	5,000
Wafangtien.....	( " )	54	12,000	—	—	—	—
Chienshan.....	( " )	—	—	4.66	110,900	—	—
Anshan.....	(Tayang)	—	—	3.49	83,170	—	—
Liaoyang.....	(Gold)	—	—	6.72	137,836	—	—
Mukden.....	( " )	—	—	3.16	53,845	—	—
Kaiyuan.....	( " )	—	—	1.23	21,809	—	—
Kungchuling.....	( " )	80	38,942	—	—	—	—
Fushun.....	( " )	2.07	65,044	2.65	42,600	—	—
Penhsihu.....	( " )	22	...	—	—	—	—
Total.....	(Mixed)	9.59	283,081	22.00	451,660	18	5,000
<b>Manchurian:</b>							
Port Arthur.....	(Gold)	—	—	1.62	46,500	—	—
Dairen.....	{(Hsiao- {(Silver)	—	—	6.47	151,389	—	—
Pitzuwo.....	(Gold)	—	—	1.60	51,737	—	—
Chinchow.....	( " )	8	1,351	3.00	44,163	—	—
Pulantien.....	( " )	—	—	80	21,120	—	—

\* Refer to the notes given on page 362.

Products of Manchurian factories at Mukden are 13,600 dozens of beer, and 4,000 dozens of wine.

Factories	Capital	Production					
		Japanese		Chinese		Others	
		Quantity (kl.)	Value (Yen)	Quantity (kl.)	Value (Yen)	Quantity (kl.)	Value (Yen)
Kaiping.....	(Tayang)	—	—	36	7,360	—	—
Tashihchiao.....	( " )	—	—	36	6,440	—	—
Haicheng.....	( " )	—	—	18	3,680	—	—
Nantai.....	( " )	—	—	90	1,840	—	—
Liaoyang.....	{(Tayang) {(Fengpiao) [120,000] {(Gold)	—	—	1,986	225,984	—	—
Suchiatun.....	(Hsienyang)	—	—	108	22,528	—	—
Mukden.....	( " )	—	—	—	—	17,600dozen	32,660
Kaiyuan.....	( " )	—	—	235	36,000	—	—
Machungho.....	( " )	—	—	129	15,417	—	—
Changtu.....	( " )	—	—	479	70,650	—	—
Ssupingtai.....	(Gold)	—	—	95	12,650	—	—
Kuochiatien.....	( " )	—	—	184	2,388	—	—
Kungchuling.....	(Tayang)	—	—	11	16,686	—	—
Liufangtzu.....	(Gold)	—	—	23	3,780	—	—
Hsinking.....	{(Hsiao- {(Hsienyang)	—	—	1,230	153,878	—	—
Fushun.....	( " )	—	—	262	37,946	—	—
Kirin.....	(Kiyang)	—	—	559	52,725	—	—
Chengchiatun.....	(Tayang)	—	—	288	45,080	—	—
Tungliao.....	( " )	—	—	173	27,462	—	—
Taonan.....	(2) (Manchoukuo yuan)	—	—	25	3,165	—	—
Total.....	(Mixed)	8	1,351	7,172	1,060,568	17,600	32,660
<b>Grand Total.....</b>	(Mixed)	<b>9,670</b>	<b>284,432</b>	<b>93,725</b>	<b>1,512,228</b>	<b>18</b>	<b>37,660</b>
						<b>17,600dozen</b>	

Miso and Soy Manufacture.—The production condition of miso (bean paste) and soy is as follows:

	Factories	Capital	Miso		Soy	
			Quantity (Metric tons)	Value (Yen)	Quantity (kl.)	Value (Yen)
<b>Japanese:</b>						
Port Arthur.....	2	(Gold)	40,000	11,700	209	31,200
Dairen.....	7	"	628,392	123,325	2,453	311,475
	[1]					
Liaoyang.....	2	"	163,000	36,000	812	55,500
Mukden.....	2	"	60,000	69,853	799	96,000
		(30,000,000)				
Changtu.....	(1)	"	20,000	—	—	—
Seuping-kai.....	2	"	28,556	—	45	12,500
Kungchuling.....	(1)	"	[75,000]	7,762	90	10,000
Hsinking.....	1	"	60,000	2,560	142	24,000
Yingkow.....	1	"	5,000	11,315	—	—
Kirin.....	(1)	"	15,000	—	—	—
Total.....	17	(Gold)	1,019,948	262,515	4,550	540,675
	(2)[2]					
<b>Manchurian:</b>						
Port Arthur.....	2	(Tayang)	—	—	76	7,300
Liaoyang.....	1	(Hsienyang)	4,000	—	—	—
Mukden.....	4	(Hsienyang)	18,300	—	402	36,984
		(Harbin-yang)	13,500	—	—	—
Hsinking.....	8	(Harbin-yang)	21,000	—	643	41,541
		(Hsiaopiao)	1,500	—	—	—
Kirin.....	3	(Harbin-yang)	100,000	—	213	26,640
Chengchiatun.....	3	(Tayang)	5,000	—	—	—
Tungliao.....	2	"	15,000	—	—	—
Taonan.....	1	(Manchoukuo yuan)	4,000	—	—	—
Tsitsihar.....	3	(Kiangyang)	16,000	—	47	4,554
Total.....	27	(Mixed)	198,300	—	1,381	151,809
	44	(Mixed)	1,218,248	262,515	5,931	692,484
Grand Total.....	(2)[2]		2,800	262,515	—	—

\* Refer to the notes given on page 362. At Harbin there are 5 principal factories, and the production capacity of Japanese factories is 70 to 90 kl., and that of Manchurian factories 170 kl.

## Miscellaneous Industry

Miscellaneous industry products mentioned in the Industrial Statistics include lumber; wooden wares; hide and leather goods; rubber goods; paper, bamboo and willow wares; awning cloths; lumber treated against petrification; fodders; printed matters and others. These goods, excepting fodders, have quite large demands in the country, but their productions are small, as shown in the table given below. This condition is caused by the fact that foreign products are imported at very cheap costs, and in the case of lumber and others, it is difficult to utilize the resources on account of the undevelopment state of transportation facilities.

Of course the statistics of production quantities are imperfect as often explained. But according to the statistics, among these miscellaneous industries, lumbering and printing take up 85% of the total capital invested, and also 75% of the total production value. Others are thus undeveloped, and their production is less than ¥500,000 a year in each case.

Table 63

## MISCELLANEOUS INDUSTRY (1931)\*

	Factories			Production			Total Number of Day-workmen (in a year)		
	Japanese	Manchurian	Total	Japanese (yen)	Manchurian (yen)	Total (yen)	Japanese	Manchurian	Total
Lumbering ...	32	4	36	3,960,614	17,300	3,977,914	202,884	4,370	207,254
	(3)		(3)						
Wooden ware	15	49	64	190,425	164,880	355,305	79,987	127,863	207,850
		[2]	[2]						
Leather goods	16	46	62	293,474	117,498	410,972	50,778	95,075	145,853
Rubber goods.	3	1	4	26,429	16,050	42,479	8,446	3,864	12,310
Paper, bamboo, willow wares	5	8	13	79,944	23,916	103,860	17,262	21,384	38,646
Awning cloths	1	—	1	686,235	—	686,235	35,247	—	35,247
Treated lumber against petrification..	1	—	1	329,115	—	329,115	9,248	—	9,248
Fodder .....	1	—	1	101,105	—	101,105	6,636	—	6,636
Printed matter	60	20	80	2,347,064	80,875	2,427,939	419,393	89,321	508,714
Total.....	134	128	262	8,014,405	420,519	8,434,924	829,881	341,877	1,171,758
	(3)	[2]	(3)[2]						

\* Refer to the notes given on page 362.

Table 64  
IMPORTS AND EXPORTS OF MISCELLANEOUS GOODS AT  
DAIREN, ANTUNG AND NEWCHWANG

	(in Haikwan taels)					
	Exports			Imports		
	1929	1930	1931	1929	1930	1931
Wooden wares (furniture, wooden wares, chip-works, etc.)	10,637	92,506	41,939	481,817	362,912	558,103
Hide & Leather wares (shoes, bags, purse, etc.)	3,193	19,954	42,678	319,544	299,103	223,518
Rubber goods (shoes, and others)	2,095	1,276	465	850,420	798,116	410,761
Fodder	862,554	907,684	575,249	10,255	11,421	16,187

**Lumbering Industry.**—The lumbering industry in Manchuria was first started by the Yamaha Company, Dairen, which established its lumbering mill in January, 1910. Since then with the increase of settlers in the country and developments of various districts, the demand of lumber rapidly increased, and particularly when the World War broke out in 1914, the export of lumber was stimulated due to the devastation of forests in Europe and the advance of prices of iron and steel. Also the demand at various cities and towns of Manchuria greatly expanded, and thus the activity of the Yalu River lumber was caused. In this manner, the development of the lumbering industry in the districts along the Yalu River was suddenly stimulated, and numerous enterprises made their appearance, encouraged by the financial boom. Following the financial panic of 1920, almost all of those lumbering enterprises were obliged to be dissolved, and those still remaining are only the Dairen Lumbering Company, the Akita Company, and the Yalu River Lumbering Company.

As the timber resources of Manchoukuo are rich, and the demand is expected to greatly increase due to the various economic construction plans already proposed, it will make signal development in future, with the progress of transportation facilities.

The present condition of the lumbering industry is as follows:

Table 65  
LUMBERING INDUSTRY (1931)\*

	Factories	Capital	Production		
			Quantity		Value (yen)
			Cubic m.	Tsubo	
<b>Japanese:</b>					
Dairen	6	(Gold) 452,800	37,129	30,000	690,705
Hsinking	6	( " ) 125,000	47,394	—	808,944

\* Refer to the notes given on page 362.

	Factories	Capital	Production		
			Quantity	Tsubo	Value (yen)
Fushun	2	(Gold) 60,000	6,828	—	142,585
Antung	16	( " ) 2,984,000	107,622	5,975	1,778,380
	(3)				
Kirin	2	( " ) 100,000	31,590	—	540,000
		(500,000)			
Total	32	(Gold) 3,721,800	230,563	35,975	3,960,614
	(3)				
<b>Manchurian:</b>					
Dairen	1	(Gold) 3,000	...	...	6,600
Chinchow	1	( " ) 8,000	102	—	2,700
Pulantien	1	( " ) ...	33	—	—
Ssuningkai	1	(Harbinyang) 250,000	...	—	8,000
Total	4	(Mixed) 261,000	135	...	17,300
<b>Grand Total</b>	<b>36</b>	<b>(Mixed) 3,982,800</b>	<b>230,698</b>	<b>35,975</b>	<b>3,977,914</b>
	(3)				

Tsubo=0.040348 cubic meter.

Table 66  
HIDE AND LEATHER PRODUCTS (1931)\*\*

	Factories	Capital	Production			Total value (yen)
			Shoes Quantity (pair)	Value (yen)	Others (yen)	
<b>Japanese:</b>						
Port Arthur	3	(Gold) 50,000	8,330	63,553	6,447	70,000
Dairen	8	( " ) 114,150	27,180	118,875	30,848	149,723
Mukden	1	( " ) 5,000	1,733	...	...	9,636
Hsinking	1	( " ) ...	1,200	11,280	720	12,000
Fushun	3	( " ) 35,000	5,570	...	...	52,115
Total	16	(Gold) 204,150	...	...	...	...

### Errata

P. 469

- 1) Insert "Hide and Leather Products Industry" above Table 66.
- 2) \*\* given to the Table of Hide and Leather Products (1931) is to be \*
- 3) \*\* in the foot note refers to Table 65

Table 64  
IMPORTS AND EXPORTS OF MISCELLANEOUS GOODS AT  
DAIREN, ANTUNG AND NEWCHWANG

	(in Haikwan taels)					
	Exports			Imports		
	1929	1930	1931	1929	1930	1931
Wooden wares (furniture, wooden wares, chip-works, etc.).....	10,637	92,506	41,939	481,817	362,912	558,103
Hide & Leather wares (shoes, bags, purse, etc.)	3,193	19,954	42,678	319,544	299,103	223,518
Rubber goods (shoes, and others).....	2,095	1,276	465	850,420	798,116	410,761
Fodder .....	862,554	907,684	575,249	10,255	11,421	16,187

**Lumbering Industry.**—The lumbering industry in Manchuria was first started by the Yamaha Company, Dairen, which established its lumbering mill in January, 1910. Since then with the increase of settlers in the country and developments of various districts, the demand of lumber rapidly increased, and particularly when the World War broke out in 1914, the export of lumber was stimulated due to the devastation of forests in Europe and the advance of prices of iron and steel. Also the demand at various cities and towns of Manchuria greatly expanded, and thus the activity of the Yalu River lumber was caused. In this manner, the development of the lumbering industry in the districts along the Yalu River was suddenly stimulated, and numerous enterprises made their ap-

	Factories	Capital	Production		
			Quantity	Value	
			Cubic m.	Tsubo	(yen)
Fushun .....	2	(Gold) 60,000	6,828	—	142,585
Antung .....	16	( " ) 2,984,000	107,622	5,975	1,778,380
	(3)				
Kirin .....	2	( " ) 100,000	31,590	—	540,000
		(500,000)			
Total .....	32	(Gold) 3,721,800	230,563	35,975	3,960,614
	(3)				
<b>Manchurian :</b>					
Dairen .....	1	(Gold) 3,000	...	...	6,600
Chinchow .....	1	( " ) 8,000	102	—	2,700
Pulantien .....	1	( " ) ...	33	—	—
Ssuningkai .....	1	(Harbinyang) 250,000	...	—	8,000
Total .....	4	(Mixed) 261,000	135	...	17,300
<b>Grand Total .....</b>	<b>36</b>	<b>(Mixed) 3,982,800</b>	<b>230,698</b>	<b>35,975</b>	<b>3,977,914</b>
	(3)				

Tsubo=0.040348 cubic meter.

Table 66  
HIDE AND LEATHER PRODUCTS (1931)\*\*

	Factories	Capital	Production			Total value (yen)
			Shoes Quantity (pair)	Value (yen)	Others (yen)	
<b>Japanese :</b>						
Port Arthur.....	3	(Gold) 50,000	8,330	63,553	6,447	70,000
Dairen .....	8	( " ) 114,150	27,180	118,875	30,848	149,723
Mukden .....	1	( " ) 5,000	1,733	...	...	9,636
Hsinking .....	1	...	1,200	11,280	720	12,000
Fushun .....	3	( " ) 35,000	5,570	...	...	52,115
Total .....	16	(Gold) 204,150	44,013	193,708	38,015	293,474
<b>Manchurian :</b>						
Port Arthur.....	5	...	3,448	13,566	2,023	15,589
Pulantien.....	1	...	4,500	...	...	2,772
Wafangtien .....	1	(Hsiaoyang) 1,000	2,000	...	...	4,000
Hsinking .....	4	...	13,935	...	...	17,780
Fushun .....	1	(Gold) 3,000	1,520	...	...	6,765
Chengchiatun ...	8	(Tayang) 14,000	—	—	3,266	3,266
Tungliao .....	17	(Hsienyang) 21,200	—	—	13,110	13,110
Taonan .....	3	(Manchoukuo yuan) 4,500	57,600	47,926	—	47,926
Tsitsihar .....	6	(Kiangyang) 3,500	3,500	5,735	555	6,290
Total .....	46	(Mixed) 47,200	86,503	67,227	18,954	117,498
<b>Grand Total .....</b>	<b>62</b>	<b>(Mixed) 251,350</b>	<b>130,516</b>	<b>260,935</b>	<b>56,969</b>	<b>410,972</b>

Refer to the notes on page 362.

\* In North Manchuria there are 2 factories at Harbin (several small ones at Fuchiatien), 5 at Hailar, and 6 at Manchouli, but their details are unknown.

\*\* In North Manchuria, there are lumbering mills at Yapolani (annual production capacity 84,930 cubic metres), Lukohsuehpo (annual capacity 28,310 cubic metres), Machiaohe (annual capacity 28,310 cubic metres), Hailin, Mutankiang, Yakoshih and Harbin. One mill at Harbin operated by a Russian has the annual production capacity of 5,000,000 square feet of veneer boards, and 10,000,000 square feet of packing boards.

**Printing Industry.**—It is natural that the printing industry will gradually develop with the progress of civilization and the increase of population. In Manchoukuo, also, the industry was undeveloped at the time of the Russo-Japanese War, and newspapers which reached the stage of daily papers after various stages of progress were mostly four page ones, but in 1931, the number of newspapers and magazines published in the leased territory and districts along railway line reached more than 250. The progress in this respect has thus been phenomenal—for informations regarding the important publications refer to the Appendix.

Since the establishment of Manchoukuo in 1932, the industry has secured much prospect for future development. In respect to the banknotes, national textbooks, school requirements and others, the establishment of Manchoukuo's own printing industry had been desired, but on account of technical knowledge and capital required, this plan has not yet materialized. To meet the enormous demand in the country, a great printing company is expected to be shortly formed in Manchoukuo.

Table 67

## PRINTING INDUSTRY \*

	Factories	Capital	Production		
			Newspaper (yen)	Printed matter (yen)	Total (yen)
<b>Japanese :</b>					
Port Arthur.....	3	Gold (unknown 1) 11,000	—	17,265	17,265
Dairen .....	32	" 3,147,850	1,205,340	675,383	1,880,723
Anshan .....	1	" ...	—	5,425	5,425
Liaoyang .....	1	" ...	6,422	—	6,422
Mukden .....	9	" (unknown 4) 330,000	70,719	132,875	203,594
Tiehling .....	1	" 6,000	6,000	2,020	2,020
Hsinking .....	7	" (unknown 2) 48,500	24,567	81,335	105,902
Fushun .....	3	" (unknown 1) 203,500	11,236	68,338	79,574
Antung.....	3	" (unknown 1) 220,000	1,872	44,267	46,139
Total .....	60	Gold 3,966,850	1,326,156	1,026,908	2,347,064
<b>Manchurian :</b>					
Dairen .....	4	Gold (unknown 2) 6,500	—	13,330	13,330

\* Refer to the notes given on page 362. In the amount for printed matters at Japanese factories at Dairen is included ¥4,542 of binding.

At Harbin, the number of printing plants in the city, excluding Fuchiatien, reaches 26.

	Factories	Capital	Production		
			Newspaper (Yen)	Printed matter (Yen)	Total (Yen)
Tashihchiao ...	1	Tayang 300	—	828	828
Liaoyang .....	1	" 2,000	—	3,000	3,000
Mukden .....	1	Gold 5,000	—	7,724	7,724
Hsinking .....	4	Hsienyang 26,000	—	49,140	49,140
		Hsiaopiao 3,000			
Fushun.....	1	Gold 1,000	—	3,495	3,495
Chengchiatun ...	2	Tayang 1,800	—	828	828
Tungliao .....	4	" 6,500	—	2,530	2,530
Taonan.....	2	Manchoukuo yuan 5,500	—	...	...
Total .....	20	Mixed 57,600	—	80,875	80,875
<b>Grand Total .....</b>	<b>80</b>	<b>Mixed 4,024,450</b>	<b>1,326,156</b>	<b>1,107,783</b>	<b>2,427,939</b>

## Electricity and Gas Industries

**Electricity Industry.**—Electricity generation in Manchoukuo is almost entirely made by coal, and only 2% is by oil or gas. There is no electricity generation by hydraulic power.

The coal deposit in Manchoukuo is enormous, and it is distributed in various different districts. Thus electric source can be obtained in many districts, abundantly and cheaply. The total coal deposit is estimated at 3,100,000,000 tons, and it is expected that numerous other deposits which have not yet been fully investigated will also be discovered in future. This vast deposit is not only the source for electricity, but also is waiting to be developed as the motive power for various industries.

At various collieries, there is produced a great quantity of coal of poor grade which does not find any utilization unless consumed on the spot. The caloric value of such coal is not uniform and it is mostly dust coal, so consequently it is difficult to ship it. When this dust coal is utilized for generating electricity, electric power can be obtained at very low cost; when the electricity thus generated is supplied to various consuming districts by an efficient transmission system, the demand will be further increased and the cost of production also will be much reduced, effecting the popularization of electricity and the development of all industries. Thus the caloric electricity generation utilizing this poor grade of coal resembles a hydraulic generation station in some ways. Collieries where electric generation is now undertaken are Fushun, Penhsihu, Pataokou and Peipiao. Particularly at Fushun, electric power is supplied to the

public at a low price compared with other districts, by utilizing this poor coal.

The amount of coal consumed for electric generation purpose in Manchoukuo is about 900,000 tons a year. To consume coal as at present even in future when the demand for electricity is bound to become greatly larger, is not at all desirable, however, even though the country has such a great deposit of coal, and therefore it is necessary and urgent to utilize hydraulic power which is believed able to compete with coal even economically.

There are abundant water supplies in the eastern, northern and western parts, which are surrounded by mountain zones, although it is generally believed that the country is short of water supply due to the small rainfall, large evaporation and as all rivers are long and run through plains mostly. The hydraulic resources of Manchoukuo, although based upon theoretical investigations, are believed to be able to constantly produce more than 1,500,000 kilowatts, and there is no necessity for pessimistic views. Particularly the Hunho, a branch of the Yalu River; Tafengmen, the upper stream of the Sungari River; and Lake Chingpo and its streams are the great water resources of Manchoukuo.

Particularly Lake Chingpo has a vast capacity, its surface area at the height of 280 metres being 108 square kilometres, and the volume of water running out of the lake is 66 cubic metres a second. Furthermore the outlet forms a waterfall of several tens of metres in height, and thus it has most advantageous features as a hydraulic power source. The rivers of Manchoukuo, however, do not generally have a good head, and they have to be utilized by means of the lock system. Consequently considerable expenditure will be required for their development. Then the points where the water supply could be utilized are mostly located far from the districts consuming electricity. Compared with the coal deposits which are found at many places, the water supply is in a disadvantageous position. Thus it is unavoidable at present that there is no utilization of hydraulic power for electricity generation, in view of the limited consumption of electricity.

**Electric Enterprises.**—*Japanese Enterprises* (Kwantung Leased Territory and the South Manchuria Railway Zone).—The Japanese electric enterprises originated in the equipment made during the Russian régime.

Russia established a caloric electricity generating station at Dairen, as

a subsidiary enterprise of the Chinese Eastern Railway, and mainly supplied power to dockyards and factories, besides giving the lighting service to a portion of the city. But when Japanese troops occupied the city in 1904, the station was placed under the control of the Japanese troops who operated it and supplied light to government offices and for military purposes. Then when the South Manchuria Railway Company opened its business in 1907, the company succeeded to the electric equipment at Dairen, and commenced general electric supply to the public. That was the beginning of the Japanese electric enterprise in Manchuria. At that time, the equipment consisted of only three 250 kilowatts triple alternating current generators, and the total electricity produced was merely 750 kilowatts.

At Port Arthur, there was electric equipment generating 120 kilowatts used by the Russians for charging barbed fences and other defensive measures. When Japanese troops occupied Port Arthur in 1905, this equipment was repaired, and light was supplied to government offices and the general public. Later with the development of the city, the supply became short, and the Kwantung Government established a new generating station of 500 kilowatts, and commenced its operation in 1907. This was the origin of the present government electric enterprise.

Also at Yingkow, the Yingkow Electric Company was established in 1905 with the permission of the Japanese troops, and obtained the right of operating electric enterprises at that place. Next year the right was transferred to the Yingkow Water Supply and Electric Company, which commenced the supply of electricity in 1907. This was one of the electric enterprises started by Japanese in Manchoukuo in the early days.

Then with the increase of settlers, development of industries, and progress of various districts, the number of electric enterprises increased year after year, and at present there are 24 electricity supply enterprises, 2 operating electric supply and electric railway lines, and 1 operating an electric railway line. The production capacity of electricity of completed equipment reaches 136,830 kilowatts.

When the Japanese electric enterprises in Manchoukuo (as standing at the end of March, 1932) are classified by operators, there are 4 government enterprises, and 23 enterprises operated by stock companies (including those similar in organization to stock companies). When the private enterprises are divided by investments, three enterprises are directly operated by the South Manchuria Railway Company, 8 are directly operated by the South Manchuria Electricity Company which became indepen-

dent of the railway company, 1 is operated by a company in which the South Manchuria Railway Company holds majority shares, 10 are operated by the companies in which the South Manchuria Electricity Company holds majority shares, and 1 is operated by company invested by Okura Company. Thus excepting those controlled by Okura Company, all the private Japanese electric enterprises in Manchoukuo are under the control of the South Manchuria Railway Company and thus form one system.

### I. NUMBER OF ELECTRIC ENTERPRISES (1932)

#### A. Classified by Operation

Operation	Operating	Not yet operating	Total
Electricity supply .....	24	—	24
Electricity supply and electric railway line .....	2	—	2
Electric railway line .....	1	—	1
Generation for Government or private use .....	46	—	46
<b>Total .....</b>	<b>73</b>	<b>—</b>	<b>73</b>

#### B. Classified by Motive Power

Motive power	Supply, railway line, supply and railway line	Government and private use	Total
Steam .....	9	12	21
	*3	*5	*8
Gas .....	2	2	4
	*2	—	*2
Crude Oil .....	4	—	4
Receiving electricity supply from others .....	17	37	54
<b>Total .....</b>	<b>32</b>	<b>51</b>	<b>83</b>
	*5	*5	*10

### 2. GENERATED POWER (K.W.), 1932

#### A. Classified by Operation

	Operating	Not yet operating	Total
Electricity supply .....	29,830	—	29,830
Supply and railway line .....	107,000	—	107,000
Electric railway line .....	—	—	—
Government and private use .....	16,505	—	16,505
<b>Total .....</b>	<b>153,335</b>	<b>—</b>	<b>153,335</b>

\* marks the repetition of reserve generating equipments possessed by those receiving the power supply from others.

### B. Classified by Motive Power

Motive power	Supply, railway line, supply and railway line	Government and private use	Total
Steam .....	136,250	16,500	152,750
Gas .....	320	5	325
Crude Oil .....	260	—	260
<b>Total .....</b>	<b>136,830</b>	<b>16,505</b>	<b>153,335</b>

### 3. NUMBER OF GENERATING STATIONS (1932)

Motive power	Supply, railway line, supply and tram line	Government and private use	Total
Steam .....	13	13	26
Gas .....	1	2	3
Crude Oil .....	4	—	4
<b>Total .....</b>	<b>18</b>	<b>15</b>	<b>33</b>

### 4. LENGTH OF TRANSMISSION LINE (kilometres), 1932

Length of Transmission routes .....	3,426
Including Special High Tension line .....	761
Length of Wire .....	12,719
Including Special High Tension line .....	3,061
High Tension line .....	4,583
Low Tension line .....	5,075
Number of Electric poles (including iron towers) .....	79,334

### 5. ELECTRIC RAILWAY LINE (1932)\*

	Metres
Line length .....	76,758
Including single line .....	39,132
Total track length .....	217,024

#### Number of Cars and Operating Condition

Passenger coaches .....	146
Locomotives .....	30
Freight cars .....	7
Trailing freight cars .....	378
Passenger coach operating kilometres .....	7,083,982

\* 1. In the number of passenger coaches are included trailers for carrying passengers.

2. The figures do not include those for the electric railways operated for private purposes.

3. In the operating kilometres of locomotives, freight cars and trailers, those of the Fushun Colliery of the South Manchuria Railway Company are not included.



Number of passenger carried .....	29,958,504
Locomotive, freight car and trailing cars operating kilometres .....	4,655
Metric tons freights carried .....	11,348,695

6. LIGHT SUPPLY CONDITION (1932)

Households supplied with lights .....	103,542
Number of electric lights .....	712,750
Kilowatts of lights supplied .....	23,457
Number of lights per household .....	7

7. POWER SUPPLY CONDITION (1932)

	Households	Number	Kilowatts
Motors .....	2,039	5,001	107,432
Other electric equipments .....	2,600	5,291	7,042
<b>Total</b> .....	<b>4,639</b>	<b>10,292</b>	<b>114,474</b>

8. CAPITAL (1932) (in yen)\*

	Supply	Supply & railway	Railway	Total
Capital .....	1,850,000	25,000,000	1,500,000	28,350,000
Paid-up Capital .....	1,137,500	22,000,000	375,000	23,512,000
Fixed Capital .....	15,899,646	31,117,262	386,903	47,403,811
Debenture or loan .....	364,000	320,000	23,754	707,754
Reserve fund .....	737,231	871,800	11,121	1,620,152

9. OUTLINE OF REVENUE AND EXPENDITURE (1931) (in yen)\*\*

	Revenue	Outlay	Profit or loss	Reserve fund	Dividend
Supply .....	5,302,234	4,147,873	1,154,361	30,580	89,125
Supply & Railway ...	9,138,603	7,647,380	1,491,223	147,300	1,760,000
Railway .....	27,063	41,196	†14,133	—	—
<b>Total</b> .....	<b>14,467,900</b>	<b>11,836,449</b>	<b>2,631,451</b>	<b>177,880</b>	<b>1,849,125</b>

\* 1. For the Chinchow Civil Administration Office, Pulantien Civil Administration Office, Pitzuwo Civil Administration Office, Yingkow Water Supply and Electric Company, and South Manchuria Railway Company, only fixed capital is given, and other items are excluded.

2. Figures for the Penhsihu Colliery and Iron Works are not included as informations are lacking.

\*\* 1. For the Chinchow Civil Administration Office, Pulantien Civil Administration Office, Pitzuwo Civil Administration Office, Yingkow Water Supply and Electric Company, and South Manchuria Railway Company, reserve fund and dividend are not given.

2. Figures for the Penhsihu Colliery and Iron Works are not included as informations are lacking.

3. † indicates loss.

Table 68  
JAPANESE ELECTRIC ENTERPRISES (1932)

Operators	Object	Opened	Capital (yen)	Motive Power Supplied	Generating station	Trans-forming station	Gene-rated power k.w.	Supplied power k.w.	Cycle	Maximum voltage	Supply Condition			
											Lights k.w.	Motors k.w.		
Port Arthur Civil Administration Office .....	lighting	1907	—	*Steam	1	1	2,000	1,800	50	11,000	24,874	638.2	1,016	3,281.8
Chinchow Civil Administration Office .....	"	1917	—	Supplied	—	1	—	450	50	11,000	7,012	160.6	110	655.6
Pulantien Civil Administration Office .....	"	1921	—	"	—	—	—	150	50	3,300	3,732	89.9	55	353.0
Pitzuwo Civil Administration Office .....	"	1921	—	"	—	2	—	600	50	11,000	3,396	76.8	14	166.0
South Manchuria Electric Company:														
Dairen Main Office ...	"	1907	—	Steam	2	8	47,000	—	50	11,000	275,916	9,291.1	3,681	27,801.9
" ... railway	"	1909	—	Steam	†4	—	—	—	Direct	600	—	61.0	—	122.0
Anshan Branch .....	lighting	1919	—	Steam	—	1	—	500	25	5,500	15,400	487.5	56	173.4
Haicheng Branch .....	"	1924	—	Supplied	—	†2	—	—	—	—	2,390	75.3	54	193.9
Mukden Branch .....	"	1908	25,000,000	Supplied	1	7	800	10,000	60	44,000	82,402	2,811.3	1,144	8,441.9
Hsinking Branch .....	"	1910	—	Steam	1	†2	6,000	—	50	22,000	40,360	1,497.7	536	5,098.9
Antung Branch .....	"	1908	—	"	1	—	9,000	—	50	3,300	52,543	1,711.3	495	7,537.0
Lianshankwan Branch.	"	1925	—	Supplied	—	—	—	50	60	3,300	870	19.1	1	1.0
Chikuanshan Branch...	"	1930	—	Crude oil	1	—	75	—	50	32,300	1,311	33.5	1	15.0
Wafangtien Electric Co.														
Wafangtien main office	"	1914	—	Supplied	—	1	—	460	50	11,000	5,060	138.1	16	38.9
Hsiungyocheng Branch	"	1924	50,000	Crude oil	1	—	75	—	50	3,300	1,701	44.6	—	—

Operators	Object	Capital (Yen)	Motive Power	Generat- ing station	Trans- forming station	Gene- rated power k.w.	Supplied power k.w.	Cycle	Maximum voltage	Supply Condition			
										Lights	k.w.	Motors	
Tashihchiao Electric Co.	"	50,000	Supplied	—	—	—	300	60	3,300	5,696	145.1	89	455.8
Yingkow Water Supply and Electric Company...	"	2,000,000	Steam	1	2	2,500	—	50	11,000	43,975	1,011.7	285	1,588.8
Liaoyang Electric Co. ...	"	300,000	Supplied	—	—	—	1,875	60	3,300	16,399	488.1	127	2,166.9
Tiehling Electric Co. ...	"	300,000	Supplied *Steam	1	3	180	1,660	60	44,000	12,386	355.4	106	581.3
Kaiyuan Electric Co. ...	"	500,000	Supplied *Gas	1	1	320	1,500	60	44,000	10,479	260.8	57	308.8
Ssuningkai Electric Co....	"	350,000	Supplied	—	17	—	1,530	50	22,000	11,930	335.8	94	715.8
Kungchuling Electric Co.	"												
Kungchuling Main Office	"		Supplied	1	1	120	800	50	22,000	9,333	260.1	146	168.7
Kuochiatien Branch ...	"	250,000	*Steam Supplied	—	14	—	—	50	22,000	1,081	22.4	2	3.0
Fangchiatien Electric Co.	"	50,000	Supplied *Steam	1	1	100	300	50	22,000	1,717	42.3	—	—
S.M.R. Fushun Colliery..	"		Steam	2	10	60,000	—	60	11,000	66,283	2,906.3	1,837	79,507.1
" railway	"			—	2	—	—	Direct	1,200	—	152.4	—	434.0
South Manchuria Rail- way Co. ....	lighting		Crude oil	1	—	10	—	"	110	266	8.0	1	1.0
Penhsihu Colliery and Iron Works .....	"		Steam	1	5	8,500	—	60	22,000	16,238	484.6	414	17,484.5
Mukden Electric Tram Company .....	railway	1,500,000	Supplied	—	11	—	250	Direct	600	—	3.6	—	5.0

Note: 1. Supply conditions are those as standing at the end of March, 1932, but other items are as standing in January, 1933.  
2. Motors are calculated at 1 kilowatt for 1 horse-power and included in the generated electric volume.  
3. \* indicates reserve equipments; † transforming towers.

*Electric Enterprises Operated by Manchurians.*—The history of electric enterprises operated by Manchurians is yet new, and the Manchouli Electric Light Bureau established in 1906, or about four years after the establishment of the electric plant at Dairen which was the first in Manchuria and Mongolia, was the first electric enterprise operated by Manchurians for the supply of electricity to the public. Since then the development of electric enterprises along the South Manchuria Railway line has greatly stimulated the officials and people of the Chinese side and there have been established various electric enterprises. At present electric enterprises operated by Manchurians reach about 70 in all, and they are all showing much progress. In proportion to the vast area of the country, however, the number of electric enterprises is yet very few, and their total production is only 60,000 k.w. or 25% of the total volume of electricity generated in the entire country.

To consider the organization system of those enterprises, stock companies are most numerous, when those operated by government and public organizations are excluded. But those operated under the stock company system are mostly showing very poor business results because of defects in management, and only among government and public enterprises there are some which are showing favourable results. They are all generating electricity by the caloric system, and possessing very small scale equipment, they engage in supplying electric lights. Those having equipment producing more than 1,000 k.w. each are limited to a few government and public enterprises operating in large cities and towns.

Their generating equipments are mostly of German or American makes, and their cycles being widely varied, it is impossible to plan mutual supply among them.

For the control of electric enterprises there are the Electric Enterprises Control Regulations and other laws which were made after the Japanese laws and regulations, but their enforcement has not yet been properly made. The extremely high charges are also stimulating the stealing of electric current by consumers who constitute the majority of the working class, and such conditions appear to be preventing the healthy progress of the industry.

As the reasons for the undeveloped condition of the industry, may be counted the scarcity of population, the low degree of the people's civilization, the primitiveness of technical knowledge, unsatisfactory supervision, and confusion of currency systems; but prior to the establishment of the new State, the prosperity of the nation and the welfare of people were

neglected, and the exactions by the military and other authorities, as well as extortions by powerful local families and merchants greatly hampered enterprise. Furthermore, the government and people of China entertained strong anti-foreign sentiments and opposed foreign investments, attempting to regain lost rights by means of double investments, and thus they caused their own downfall. These developments are believed to have been the greatest causes that prevented the development of the industry. Such are things of the past at present, and with the establishment of the new State, various systems are being perfected, and the electric industry has begun to see the light of future development.

**Control of Electric Industry in Manchoukuo.**—The majority of the Japanese electric enterprises are either direct undertakings of the South Manchuria Railway Company, or affiliated activities, as already explained. Thus Japanese enterprises are, on the whole, controlled under one great system. Manchurian enterprises are under provincial management, municipal management, and private management, and their administrative supervision is now under the Department of Industry, Manchoukuo Government.

The electricity industry of Manchoukuo has a great mission in developing industries, and thus it is urgently necessary at present to plan for the most rational control, viewing Manchoukuo as one great unit, disregarding the administrative boundary between Japanese and Manchurian territories, in view of the present special administrative and economic condition of the country. For this end, not only is it necessary to effect control of both capital and technical features, but also it is important to consider the adoption of electric enterprise control regulations to be applied in common to both Japanese and Manchurian enterprises, so that closer cooperation and relations between the authorities of the two countries will be brought about. However, in executing such a plan, there will be considerable difficulty as it covers both the Japanese and Manchurian administrative districts.

Since the Manchurian incident, the South Manchuria Electric Company, which possesses great influence in the electric field of the country has extended its controlling influence by amalgamating or placing under Japanese-Manchurian joint management such Manchurian electric enterprises as the Yenchí Electric Company, Tunghwa Electric Company, Koshan Electric Company, and Hsifeng Electric Company. Thus it appears as if the South Manchuria Electric Company is controlling the electric enterprises of the entire country. By the basic policy of economic

construction later announced, it is stipulated that electric enterprises are to be placed under controlled management and power is to be supplied abundantly and cheaply. But no concrete plan has yet been adopted for this purpose, although it is clearly declared that the enterprises are to be controlled. The Manchuria Electric Association formed by Japanese and Manchurians appointed the Manchuria Electric Committee, in view of the special characteristics of the electric industry, to submit their opinion on various important problems concerning the industry to the Japanese and Manchurian authorities. These steps will also show that the South Manchuria Electric Company alone is not to control the electric enterprises of the country. In his instructions given in 1933, the Minister of Industry, Manchoukuo Government, said: "To electric enterprises, sufficient control and policy will be applied from the national standpoint in order to encourage their progress. The department is now giving most careful consideration to the adoption of a control plan. Permits for new electric enterprises as well as for the investment of foreign capital or participation of foreigners or other changes in management, in existing enterprises have to be referred to the department in future." This is believed to be a transitory measure until the establishment of a proper control system. This development also proves that the South Manchuria Electric Company will not necessarily monopolize the management of electric enterprises in Manchoukuo.

The National Foundation Electric Company (capital ¥ 100,000,000), a joint stock company of Japanese-Manchurian management, is to be established with its main office at Hsinking, for the control of electric enterprises in Manchoukuo.

**Gas Industry.**—At present, gas producing plants are established at six important cities along the South Manchuria Railway line, and are supplying gas to the public.

Manchurians have not used gas until recently, because of the difference in their native customs, and thus there was no gas enterprise undertaken by Manchurians. But since the Manchurian incident, Manchurians using gas have rapidly increased in number due to the sudden progress of civilization, and at Mukden, Hsinking, Antung and other places, Japanese enterprises planned to extend their activity from the South Manchuria Railway zone to Manchurian territory, and obtaining the approval of both the Japanese and Manchoukuo Governments, they started construction work. Thus the future of the gas industry of Manchoukuo has become bright.

The gas industry of Manchuria was started in 1902 when under the management of the Chinese Eastern Railway, a small gas producing plant was established at Dairen for supplying gas for lighting purposes. Later, the South Manchuria Railway Company planned a gas industry as a means of utilizing Fushun coal in 1907, and established at Dairen in 1910 a gas producing plant with a capacity of 300,000 cubic feet a day, and one gas tank of 150,000 cubic feet. In 1909, a gas enterprise was commenced under the direct management of the Fushun Colliery of the railway company. Gas enterprises were started at Anshan in 1920, at Mukden in 1923, at Antung in 1924, and at Hsinking in 1925. In 1925, the above-mentioned five gas works, excepting the gas plant at Fushun, were separated from the railway company and came to be operated by the South Manchuria Gas Company, newly established with a capital of ¥ 10,000,000, as they are today.

Table 69  
GAS INDUSTRY

Districts	Main Equipments		Coal Charge (metric tons)	Gas Production (cubic feet)
	Producing furnace capacity (24 hours) (cubic feet)	Length of pipes laid (metres)		
1931:				
South Manchuria Gas Co.				
Dairen .....	2,100,000	264,485.1	18,400	395,347,503
Anshan .....	—	28,198.5	—	18,829,079
Mukden .....	400,000	87,810.7	3,574	62,566,320
Antung .....	120,000	54,638.1	1,352	24,647,166
Hsinking .....	120,000	37,771.3	990	17,618,548
Total .....	2,740,000	472,903.7	24,316	519,008,616
Fushun Colliery .....	566,717,496	93,964.0	228,690	15,388,359,177
<b>Grand Total.....</b>	<b>559,457,496</b>	<b>566,867.7</b>	<b>253,006</b>	<b>15,907,367,793</b>
1930:				
S.M. Gas Co. ....	2,740,000	460,554.5	25,824	514,896,530
Fushun.....	566,717,496	92,835.0	287,319	22,222,370,311
Total .....	569,457,496	553,389.5	313,143	22,737,266,841
1929:				
S.M. Gas Co. ....	2,740,000	446,511.0	25,322	495,658,387
Fushun.....	566,717,495	91,678.0	271,309	20,541,474,538
Total .....	569,457,495	538,189.0	296,631	21,037,132,925
1928:				
S.M. Gas Co. ....	2,740,000	426,992.0	23,572	451,550,698
Fushun.....	566,717,495	70,166.0	268,784	20,242,261,572
Total .....	569,457,495	497,158.0	292,356	20,693,812,270

Table 70  
GAS SUPPLY CONDITION\*

Districts	Household Use & Street Lighting		Industrial Use		Total	
	Volume (cubic feet)	Charge (yen)	Volume (cubic feet)	Charge (yen)	Household Number	Volume (cubic feet)
1931:						
South Manchuria Gas Co.						
Dairen .....	311,320,000	753,558.41	35,118,000	50,791.68	65,805	346,438,000
Anshan .....	17,650,700	42,380.92	91,900	124.04	4,372	17,742,600
Mukden .....	52,891,120	158,958.36	3,264,968	6,349.37	17,764	56,156,088
Antung.....	20,067,200	63,315.35	1,986,578	3,204.84	6,527	22,053,778
Hsinking .....	15,756,261	52,698.88	—	—	5,765	15,756,261
Total .....	417,685,281	1,070,911.92	40,461,446	60,469.93	100,233	458,146,727
Fushun Colliery .....	47,566,525	75,242.00	15,339,719,203	—	3,038	15,387,285,728
<b>Grand Total.....</b>	<b>465,251,806</b>	<b>1,146,153.92</b>	<b>15,380,180,649</b>	<b>—</b>	<b>103,271</b>	<b>15,845,432,455</b>
1930:						
S.M. Gas Co. ....	420,580,881	1,091,508.66	48,043,771	72,262.38	93,620	468,624,652
Fushun .....	42,865,178	68,888.00	22,179,595,133	—	2,985	22,222,370,311
Total .....	463,446,059	1,160,396.66	22,227,548,904	—	96,605	22,690,994,963
1929:						
S.M. Gas Co. ....	390,607,147	1,027,280.00	56,025,633	84,422.00	87,790	446,632,780
Fushun .....	41,102,014	64,076.00	20,500,372,524	—	2,759	20,541,474,538
Total .....	431,709,161	1,091,356.00	20,556,398,157	—	90,549	20,988,107,318
1928:						
S.M. Gas Co. ....	351,799,016	939,363.00	48,154,957	72,791.00	82,359	399,953,973
Fushun .....	38,212,427	58,997.00	20,204,049,145	—	2,538	20,242,261,572
Total .....	390,011,443	998,360.00	20,252,204,102	—	84,897	20,642,215,545

\* The gas supplied for household use at Fushun is that used outside the Company's consumption, the gas supplied for industrial use is that consumed by the Company for its own use, and consequently the charge for the industrial use is not included in the above table.

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## CHAPTER XV

## TRANSPORT AND COMMUNICATIONS

## Introduction

The area of Manchoukuo is estimated at roughly 1,190,000 square kilometres. This is more than three times the area of Japan proper, or about 1.8 times that of the whole Japanese Empire; somewhat less than one-sixth of the mainland territory of the United States, and slightly larger than the extent of Germany and France combined.

The total length of all the railways in Manchoukuo, however, is only about 6,400 kilometres, including light railways of not too solid construction. This is only about one-third of the railroads of Japan, whose total length is some 20,600 kilometres. The length of railways per 1,000 square kilometres is about 54 kilometres in Japan, but in Manchoukuo it is only 5 kilometres, less than one-tenth of the ratio in Japan. For comparison, the ratio in the United States is 51 kilometres, in England 135 kilometres, and in China 1 kilometre.

As transportation routes substituting for or supplementary to the railways, there are motor roads, waterways, and coastwise ship lines. Motor roads, with the exception of Jehol for which information is insufficient, covered 13,200 kilometres in 1928, excluding the roads in cities, towns, and villages. Compared with the 43,200 kilometres of motor roads, excluding the roads in cities, towns, and villages, of Japan in 1927, the Manchurian motor roads are few and undeveloped. Manchoukuo having a coast-line of only 1,600 kilometres on the Gulf of Pohai, the coastwise ship lines are not worth mentioning. There are good inland waterways as the Manchurian rivers run through great plains from their sources to the sea. Particularly the Sungari River is navigable by ships of more than 1,000 tons for a distance of about 700 kilometres from its confluence with the Amur to Harbin. But the great drawback of the river is that during the five months of freezing in winter, steamship navigation is impossible, although motor cars can use the frozen river as a highway during these winter months. Next comes the Liao River, but this is not navigable for large ships as the stream near its mouth is shallow. More details about the rivers and river navigation of Manchoukuo are given later.

In short, the transportation facilities of Manchoukuo are undeveloped compared with the conditions in other countries, and even this imperfect system is mostly dependent upon foreign capital. Out of 6,400 kilometres of railways, only 1,500 kilometres or 23% were constructed and are operated by native capital, and the remaining larger portion is maintained by capital supplied by Japan, U. S. S. R., Great Britain and other countries. Even on the Sungari River, the most important inland waterway of Manchoukuo, the navigation right was held by the Chinese Eastern Railway and Russian individuals, as is explained later.

### Railways

**History of Manchurian Railways.**—The first railway construction in Manchuria was made by Great Britain and Russia, in competition against each other, in the period from 1890 to the beginning of the 20th century. Great Britain established her influence in Manchuria by constructing the North China Railway which now connects Peiping with Mukden. This railway was at first a short, light railway for carrying the output of the Kaiping (開平) coal mine, situated between Shanhaikwan and Tientsin. From about 1887, Li Hung-chang (李鴻章) attempted to further extend this light railway line from military considerations against Japan, and although it was first planned to carry out the proposed extension with native capital, he failed. Then, obtaining the loan of funds from Great Britain, Germany, Russia and other countries, construction was started to extend the line southward to Tientsin and Peking, and eastward to Yingkow and Mukden. It was in 1894, the first year of the Sino-Japanese War, that the eastern extension of the line crossed the Shanhaikwan barrier and entering Manchuria reached Suichung (綏中), about 90 kilometres from Shanhaikwan. Thus, this line was the first railway constructed in Manchuria.

As Russia obtained the privilege of constructing the Chinese Eastern Railway (now North Manchuria Railway) in 1896, the British and Chinese Corporation granted a loan of 2,300,000 pounds sterling to the Peking Government in October, 1898, and urged the speedy construction of the eastern extension of the Railway of North China. As the result of this British activity confronting the Russian advance, the main line was extended in 1903 to Hsinmintun situated in the important locality on the middle course of the Liao River, and a branch line was constructed to Yingkow on the lower stream of the Liao, which was the only open port



Street in Dairen.

of Manchuria until October, 1903. (The connection between Hsinmintun and Mukden was completed in 1907).

But the advance of this Beiching (北清) or North China Railway into Manchuria was not made without resistance by Russia. Russia insisted that the entire territory of Manchuria was under her influence and opposed the advance of British capital into Manchuria. In September, 1896, Russia obtained the right of constructing and operating a railway line crossing North Manchuria east to west and also the 'absolute and exclusive right of administration' in the railway zone. Then in July, 1898, Russia secured a similar right to construct a branch line from a station (Harbin) on the main line to Port Arthur and Talienwan (大連灣), and also to Yingkow.

The speedy construction of the Chinese Eastern Railway by Russia surprised the whole world. The construction of the main line extending from Manchouli to Vladivostok via Pogradichnaya was commenced in May, 1898, and finished in 1901. The southern line, including the Yingkow branch, was completed in 1903. The main and branch lines, comprising 2,500 kilometres, were opened to traffic on July 1, 1903.

It was in the same year that the North China Railway, under British capital, reached Yingkow, and thus South and North Manchuria came to be connected by railways at the Liao River, by the capital of the two great Powers which rivalled each other to gain influence in China.

By the terms of the Portsmouth Treaty of September, 1905, concluded to end the Russo-Japanese War, Japan succeeded to the Russian railway in Manchuria, south of Changchun (Hsinking) totalling about 840 kilometres. Also, according to the agreement attached to the Sino-Japanese Treaty concluded in December, 1905, Japan secured the right of improving the light railway between Antung and Mukden, about 290 kilometres, constructed by the Japanese Army during the Russo-Japanese War. The gauges of these railways were divergent as the line constructed by Russia was of five feet, the portion of the Russian railway occupied by Japan during the war was of the narrow gauge as used in Japan, and the Antung-Mukden light railway was 2 feet six inches wide. The South Manchuria Railway Company changed these latter lines to the international wide gauge of 4 feet 8½ inches, by May, 1908. The expenditure required for this improvement was defrayed by debentures floated in England, amounting to more than ¥42,000,000.

E. H. Harriman, American railway magnate, proposed, in 1905, immediately after the conclusion of the Russo-Japanese War, [to secure one

half of the right Japan had obtained in Manchuria from Russia, but his plan did not succeed. Then the United States planned in 1907 to secure the right of organizing the Manchurian Bank with a capital of \$10,000,000 for the purpose of supplying funds for the construction of the Hsinmintun (新民屯)-Aigun (璦琿) Railway, but at the last moment this plan had to be given up on account of a political change in China. Again, in 1909, the United States proposed the neutralization of all railways possessed by Japan and Russia in Manchuria, declaring that if the neutralization plan was not acceptable she would exercise the secured right for loan (including the operating right) for the construction of the Chinchow (錦州)-Aigun (璦琿) railway, a rival line to both the South Manchuria Railway and the Chinese Eastern Railway. This American proposal also failed because of the objections raised not only by Japan and Russia but also by their respective allies, Great Britain and France.

Thus, while Japan suppressed the schemes proposed by the United States, she made efforts to secure new railway privileges. The first of such new railway plans was the construction of the Kirin (吉林)-Changchun (長春) Railway, 128 kilometres. By the Protocol to the Treaty of December, 1905, it had been already agreed that China would construct this railway with capital raised by herself, but at the same time it was agreed that China borrow from Japan what she could not supply herself, this amount being about one-half of the total sum required. In 1908, this stipulation of the treaty was put into effect, and the fund of ¥2,150,000 was supplied by the South Manchuria Railway Company, and the line was completed in October, 1912.

The foregoing is an outline of railway construction in Manchuria prior to the Great War. Besides which, however, there was constructed in October, 1913, the Hsichien (溪城) Railway, which is a mining railway, running between Penhsihu and Niuhsintai, with Sino-Japanese joint capital. As a purely Chinese railway, there was only the Tsitsihar-Anganki Light Railway, gauge 1 metre, 29 kilometres in length, which connects Tsitsihar, the capital of Heilungkiang Province, with Anganki on the Chinese Eastern Railway. This railway was opened in October, 1909.

Railways in Manchuria prior to the Great War were as follow :

Japanese, Japanese Loan and Sino-Japanese Railways ...	1,265 kilometres (31%)
South Manchuria Railway .....	1,110 "
Kirin-Changchun Railway .....	128 "
Hsichien Railway .....	26 "
Russian Railway (Chinese Eastern Railway) .....	1,726 " (43%)

British Loan Railway (including Non-Manchurian Section of Peking-Mukden Railway) .....	1,014 kilometres (25%)
Chinese Railway (Tsitsihar-Anganki Light Railway)...	29 " (1%)
Total .....	4,035 "

The total railway length of 4,035 kilometres as existing prior to the Great War is about sixty percent of the present length of more than 6,500 kilometres (including Peking-Shanhaikwan line). Prior to the Great War, Russia had the largest portion of Manchurian railways with 43%, and Japanese owned and invested railways came next with 31%. The purely Chinese railway was less than 1% and even that line was a light railway. Thus it is interesting to compare this condition with the rapid growth of Chinese railways after 1924-25.

After the Great War, the development of railways constructed with Japanese funds and those built with Chinese capital was remarkable. The line constructed with Japanese capital is the Ssupingkai (四平街)-Taonan (洮南) Railway with a branch to Tungliao (通遼), 426 kilometres, opened to traffic in October, 1923.

This is one of the so-called Five Railways of Manchuria and Mongolia which were mentioned in the agreement reached between Japan and China in October, 1913, for securing beforehand the loan privilege for the construction of important railway lines in South Manchuria. The rights obtained by Japan by this agreement were as follow :

- (A) Japan to supply capital when the Chinese Government constructs the following three railways :
  - (1) Ssupingkai-Chengchiatun-Taonan,
  - (2) Kaiyuan-Hailung,
  - (3) Changchun-Taonan.
- (B) Preferential right to be given to Japanese capital in case China requires foreign capital for the construction of the following two railways :
  - (1) Hailung-Kirin,
  - (2) Taonan-Jehol.

Of the five railways mentioned in the above treaty, only the Ssupingkai-Taonan Railway with the Tungliao branch, was constructed according to the treaty terms. The construction of this line was commenced in April, 1917, with the capital supplied by the South Manchuria Railway Company, and opened to traffic in October, 1923, as mentioned above.

In September, 1918, Japan secured a promise from the Chinese Government that the four lines of the above-mentioned Five Railways of



Manchuria and Mongolia, excluding the Ssupingkai-Taonan line which was already under construction, and another line running from a station of the Taonan-Jehol line to a seaport were to be constructed by the Chinese Government with loans obtained from Japan. This is the treaty respecting the so-called Four Railways of Manchuria and Mongolia (the Kaiyuan-Hailung line and the Hailung-Kirin line mentioned in the treaty of 1913 respecting the Five Railways of Manchuria and Mongolia having been made into one line by the treaty of 1918, the Five Railways became Four Railways).

Not only was none of the privileges respecting these four railways put into effect, but also China constructed her own railways on those proposed routes, as is explained later.

Also with Japanese capital were opened to traffic the Taonan-Angangki (洮南—昂昂溪) Railway in July, 1926, the Chinfu (金福) or Chinchou (金州)-Chengtzutuan (城子壩) Railway in October, 1927, the Kirin-Tunhwa (吉林—敦化) Railway in October, 1928, and the Tientu (天圖) Light Railway in the Chientao district in August, 1922.

The construction of all the railways undertaken as government lines since the establishment of Manchoukuo has been done by the South Manchuria Railway Company, and such lines are to become South Manchuria Railway Company loan railways. Of such lines, those already completed are the Tunhwa-Tumen (敦化—圖們) Railway, opened to traffic in September, 1933; the Hailun-Koshan (海倫—克山) Railway which was opened in February, 1933; and the Lafa (拉法)-Harbin Railway which was opened to traffic in January, 1934.

The development of railways built with Chinese capital will next be described.

By the utilization of foreign capital and the exclusive operation of important commercial activities, including banking and transactions in staple produce, the Government of Fengtien Province managed to amass capital, and then started the construction of railways to rival the Japanese lines. As early as 1905, Japan expected such rival construction by China, and by the Protocol to the Sino-Japanese Treaty signed in December, 1905, she obtained the promise of the Chinese Government not to construct lines parallel to the South Manchuria Railway. However, respecting the existence of this protocol and also the interpretation of the term 'parallel lines', China asserted an opinion quite contrary to that of Japan, and hurried new railway construction despite Japanese protests.

The first of such lines was the railway which runs from Tahushan

(打虎山) on the Peking-Mukden Railway to Tungliao (通遼), the terminus of the proposed Japanese loan railway, a distance of 252 kilometres. This line was constructed by Chang Tso-lin between 1921 and the end of 1926. Other lines were the Fenghai (奉海) and Kihai (吉海) Railways, which connect Mukden and Kirin via Hailung and Chaoyangchun, and became the centre of some serious discussion because of their infringement of the rights obtained by Japan respecting the Five Railways (later Four Railways) of Manchuria and Mongolia. The first of the two lines was opened to traffic in September, 1927, and the second in May, 1929.

And after the North-Eastern Communications Committee was appointed in September, 1928, by the former Government of Mukden it made efforts to rival the South Manchuria Railway by forming a great railway system including lines constructed with Chinese capital and those built with Japanese loans.

The railways constructed in northern Manchoukuo with Chinese capital are the Hulan-Hailun (呼蘭—海倫) Railway, opened in December, 1928; the Tsitsihar-Koshan (齊齊哈爾—克山) Railway opened in the same month; and some short colliery railways. The work of connecting the above-mentioned two railways was undertaken by the Manchoukuo Government, and the construction of the line between Hailun and Koshan, 168 kilometres, was completed in December, 1932. With the completion of this line, the two great plains of North Manchuria are now served by a railway route in the form of a horse-shoe.

The above mentioned lines are the principal railways now existing in Manchoukuo.

Table 1  
DEVELOPMENT OF RAILWAY LINES IN MANCHURIA  
(in kilometres)

Year	Ordinary Railway	Light Railway	Total
1903	3,377	—	3,377
1908	3,459	363	3,822
1913	3,936	29	3,965
1918	4,043	55	4,098
1923	4,469	113	4,582
1924	4,541	166	4,707
1925	4,604	191	4,795
1926	5,073	230	5,303
1927	5,650	230	5,880
1928	6,026	230	6,256
1930	6,277	230	6,507
1933*	6,166	119	6,370

\* The Peiping-Shanhaikwan line (454 k. m) of the Peining Railway excluded.

Table 2

## PRINCIPAL RAILWAYS

Railways	Track Gauge	Lines	Opened to Traffic
South Manchuria Railway	1.43 m. (4 feet 8½ inches)	Dairen-Changchun } Mukden-Antung } 1,110.3 k.m. Other branches }	April, 1907
North Manchuria (Chinese Eastern) Railway	1.52 m. (5 feet)	Manchouli-Pogranichnaya } 1,718 k.m. Harbin-Kwanchengtze }	July, 1903
Peiping-Mukden Railway	1.43 m.	Peiping-Mukden 877 k.m. (Shanhaikwan-Mukden 423) Tahushan-Tungliao 251 Koupangtze-Yingkow 91 Chinchow-Peipiao 113 Lienshan-Hulutao 12	Peiping-Mukden, 1907 Koupangtze-Yingkow, 1903 Chinpei line, Dec. 1924 Tahushan-Tungliao, Nov. 1927 Lienshan-Hulutao, 1920
Ssuta Railway	"	Total 1,344 k.m. (Manchoukuo lines 889) Ssuningkai-Taonan } 426 k.m. Chenchiatun-Tungliao }	July, 1924
Taoang Railway	"	Taonan-Angangki 224 k.m.	July, 1926
Hsinking-Tumen Railway	"	Kirin-Changchun 128 k.m.	Oct. 1912
Kichang Railway	"	Kirin-Tunghua 210 k.m.	Oct. 1928
Kitun Railway	"	Tunghua-Tumen 190 k.m.	Sept. 1933
Tuntu Railway	"	Chinchou-Chengtzutuan 102 k.m.	Oct. 1927
Chinfu Railway	"	Mukden-Chaoyangchen } 326 k.m. (Main line)	Main line Aug. 1928
Fenghai Railway	"	Meihokou-Hsian } (Branch line)	Branch line Dec. 1927
Kihai Railway	"	Kirin-Chaoyangchen 183.4 k.m.	May, 1929
Huhai Railway	"	Machiachuankou-Hailun 215 k.m.	Dec. 1928
Tsiko Railway	"	Angangki-Tsitsihar } 158 k.m. Koshanchen }	Angangki-Tsitsihar Dec. 1928 Tsitsihar-Koshanchen Dec. 1932
Haiko Railway	"	Hailun-Koshan 168 k.m.	Feb. 1933
Muling Colliery Railway	1.52 m.	Hsiao Chengtze-Lishuchen } about 63 k.m.	March, 1925
Haolikang Colliery Railway	"	Lienkiangkow-Hsingshanchen } 56 k.m.	Nov. 1926
Hsichien Light Railway	2.76 m. (2 feet 6 inches)	Penhsihu-Chienchang } Operating line: Penhsihu-Nihsintai 26 k.m.	Feb. 1914
Kaifeng Light Railway	1 m.	Kaiyuan-Hsifeng 64 k.m.	May, 1926
Tsiang Light Railway	"	Angangki-Tsitsihar 29 k.m.	Oct. 1909
Taoso Railway	1.43 m.	Taonan-Solun 320 k.m.	Under construction
Tumen-Mutanchiang Railway	"	Tumen-Mutanchiang 257 k.m.	"
Koupeiyngtru-Lingyuan Railway	"	Koupeiyngtru-Lingyuan 163 k.m.	"
Peian-Tierhchan Railway	"	Peian-Tierhchan 150 k.m.	"

## OF MANCHOUKUO

Capital	Management
¥ 800,000,000*	Japanese Management (The South Manchuria Railway Co.)
G. Rubles 375,000,000 (Cost of Railway Construction)	Manchoukuo-Soviet Joint Management (The North Manchurian (Chinese Eastern) R. Co.)
Chinese Government..... \$ 23,903,392	South Manchuria Railway Co. (West of Shanhaikwan : The Railway Department of Chinese National Government)
British Loan (1898) ..... \$ 11,730,000	
Accumulated ( £ 2,300,000 )	
Surplus revenue..... \$ 75,708,599	
Total ..... \$ 111,341,991	
Japanese loan ..... ¥ 44,000,000	South Manchuria Railway Co.
Japanese loan ..... ¥ 28,800,000	"
Japanese loan ..... ¥ 36,300,000	"
Constructed by Japanese Capital (S. M. R. Co.)	"
Public loan (Native and Japanese)... ¥ 4,000,000	Manchurian-Japanese Joint Management (Chinfu Railway Co. Operated by S. M. R.)
Government Investment ..... 10,000,000	South Manchuria Railway Co.
Public Investment ..... 10,000,000	
Total ..... Fengtien-Tayang Yuan 20,000,000	
Japanese loan ..... ¥ 3,000,000	"
Native Capital but particulars are unknown	"
Invested by Heilungkiang Provincial Government and Kuanghsin Co. .... 5,000,000	"
Public Investment..... 5,000,000	"
Total..... Fengtien-Tayang Yuan 10,000,000	"
Government Investment	"
Fengtien-Tayang Yuan 1,200,000	
Native & Russian investment	Operated by Muling Colliery Co.
Harbin-Tayang Yuan 3,000,000	
Native investment Harbin-Tayang Yuan 1,200,000	Operated by Haolikang Colliery Co.
Invested by S. M. R. .... 399,000	
Invested by Penhsihu Colliery & Iron Works ¥ 171,000	Manchurian-Japanese Joint Management
Total ..... ¥ 570,000	
Fengtien-Tayang Yuan 2,820,000	Semi-Government Management Operated by the Tsiang Railway Co.
Public Investment and Investment of Kuanghsin Co..... \$ 350,000	Government Management
Construction entrusted to the South Manchuria Railway Co. for the Sum of ..... ¥ 76,900,000	

\* Of this the amount of ¥ 272,105,000 is invested in railway proper.

## Japanese Railway

**South Manchuria Railway.**—This railway consists of the following lines :

Dairen-Changchun .....	704.3 kilometres
Antung-Mukden .....	260.2 "
Port Arthur Branch .....	50.8 "
Yingkow Branch.....	22.4 "
Yentai Branch.....	15.6 "
Fushun Branch .....	52.9 "
Hunyu Branch.....	4.1 "
Total .....	1,110.3 "

All these lines are of the international wide gauge of 4 feet 8½ inches. As already mentioned, this railway was acquired by Japan according to the Portsmouth Treaty of September, 1905, and the Sino-Japanese Treaty of December, 1905. The rights Japan secured in respect of the railway line between Dairen and Changchun, and branch lines, were those originally held by Russia. That is to say, Japan had to restore the railway to China free of charge after 80 years (i.e., after 1983) from the time of the opening of the railway (1903) or to sell back the line to China after the expiration of 36 years from the opening of the railway (i.e., after 1939) at the option of China. But by the terms of the Sino-Japanese Treaty concluded in 1915, the stipulation for the sale of the railway to China after 36 years in case of China demanding was abolished, and the period terminating in free surrender was extended to ninety-nine years (i.e., to 2002). The Antung-Mukden line was first stipulated to be sold to China in 1923 at a price to be determined by a foreign expert selected by both parties, but by the treaty of 1915, the date was extended to 2007. As is well-known, China was denying these treaty stipulations extending the period of the Japanese railway rights.

During the above-mentioned periods, Japan possesses the right of owning and operating the railways, but there are also other important rights. The first is the 'absolute and exclusive administration' in the railway zone. The second is the right of stationing troops in the zone. The right of the absolute and exclusive administration in the railway zone is based on Article VI of the Contract for the Construction and Operation of the Chinese Eastern Railway concluded between China and Russia in 1896. But the right of stationing troops was established by an additional article of the Treaty of Peace, which stipulated that Russia and Japan reserve the right

of stationing railway guards for the protection of their respective railways in Manchuria and that the number of railway guards should not exceed an average of fifteen per kilometre. This agreement, however, was made between Japan and Russia, and China had no connection with it whatever. In the additional Agreement attached to the Treaty of Peking, December, 1905, Japan promised to China that 'in the event of Russia agreeing to the withdrawal of her railway guards,' Japan would 'consent to take similar steps accordingly'; also Japan promised that 'when tranquillity shall have been re-established in Manchuria and China shall have become herself capable of affording full protection to the lives and property of foreigners, Japan will withdraw her railway guards simultaneously with Russia.' It was because of these stipulations that Japan claimed the right, on the one hand, to station her railway guards in Manchuria for the protection of her railway even after the withdrawal of the Russian guards, and China, on the other hand, denied the claim.

Manchoukuo has declared that it has succeeded to all treaty obligations the Chinese Government formerly had in respect of Manchuria (Declaration of March 12, 1932). The Chinese Government did not recognize this right of stationing troops along the railway lines by Japan. But Manchoukuo not only did not take such an attitude, but also further extended the scope of the right and concluded a treaty for joint national defence with Japan (Japan-Manchoukuo Protocol of September, 1932).

Viewed from the standpoint of railway revenue, the South Manchuria Railway is one of the most profitably operated railways of not only Manchoukuo but the world. The figures for the railway revenue of the South Manchuria Railway are as follows :

**Table 3**  
RAILWAY REVENUE AND EXPENDITURE OF  
SOUTH MANCHURIA RAILWAY

	(Yen)			
	Revenues	Expenditures	Operating Ratio %	Net Surplus
1907 .....	9,768,887	6,101,615	62.5	3,667,272
1908 .....	12,537,142	5,161,408	41.2	7,375,735
1909 .....	15,016,198	5,818,333	36.0	9,197,865
1910 .....	15,671,605	6,542,640	38.3	9,128,965
1911 .....	17,526,288	6,908,354	36.6	10,617,934
1912 .....	19,907,456	7,846,923	35.7	12,060,533
1913 .....	22,275,132	7,913,948	32.8	14,361,184
1914 .....	23,216,722	8,345,286	33.2	14,871,435

	Revenues	Expenditures	Operating Ratio %	Net Surplus
1915	23,532,118	8,174,520	32.1	15,357,597
1916	27,815,349	8,435,939	30.3	19,379,409
1917	34,457,923	10,858,734	31.5	23,599,189
1918	44,992,872	17,038,157	37.9	27,954,715
1919	67,060,720	30,528,938	45.5	36,531,782
1920	85,316,806	36,760,264	43.1	48,556,542
1921	78,204,132	33,172,718	42.4	45,031,416
1922	87,813,029	34,169,285	38.9	53,643,744
1923	92,269,704	35,787,589	38.8	56,482,115
1924	92,561,732	36,553,297	39.5	56,008,435
1925	97,395,288	38,800,691	39.8	58,594,537
1926	107,923,567	45,951,623	42.6	61,971,944
1927	113,244,180	45,235,835	39.9	68,008,345
1928	118,639,090	44,358,065	37.4	74,281,024
1929	122,103,743	47,213,508	38.7	74,890,235
1930	95,330,730	36,768,576	38.6	58,562,154
1931	84,573,356	36,774,792	43.5	47,798,564
1932	103,846,512	38,795,847	37.4	65,050,665

Table 4

## RAILWAY REVENUES OF S.M.R. CLASSIFIED

(Yen)

Year	Passenger Revenues	%	Freight Revenues	%	Other Revenues	%	Total
1907	3,594,239	37	6,160,274	63	14,375	—	9,768,887
1908	2,964,587	24	9,542,262	76	30,293	—	12,537,142
1909	3,250,412	22	11,241,859	75	523,928	3	15,016,198
1910	3,264,639	21	11,641,529	74	765,437	5	15,671,605
1911	4,273,423	24	12,471,415	71	781,449	5	17,526,288
1912	5,008,633	25	13,913,341	69	985,482	6	19,907,456
1913	5,069,127	23	16,159,171	73	1,046,834	4	22,275,132
1914	4,367,168	19	17,550,150	76	1,299,404	5	23,216,722
1915	4,842,338	21	17,260,655	73	1,429,124	6	23,532,118
1916	6,040,453	22	19,882,476	71	1,892,420	7	27,815,349
1917	8,136,707	23	23,793,056	69	2,528,160	8	34,457,923
1918	10,911,382	24	30,377,682	68	3,703,808	8	44,992,872
1919	14,243,790	21	46,305,759	69	6,511,171	10	67,060,720
1920	14,659,337	17	63,867,030	75	6,790,439	8	85,316,806
1921	12,194,288	16	59,615,835	76	6,394,010	8	78,204,132
1922	12,389,464	14	69,518,111	78	5,905,454	8	87,813,029
1923	13,431,865	15	72,582,755	79	6,255,083	6	92,269,704
1924	13,645,538	15	77,019,368	83	1,896,826	2	92,561,732
1925	14,530,942	15	80,535,820	83	2,328,527	2	97,395,289

Year	Passenger Revenues	%	Freight Revenues	%	Other Revenues	%	Total
1926	15,216,353	14	89,513,059	83	3,194,155	3	107,923,567
1927	16,102,953	14	94,040,819	83	3,100,408	3	113,244,180
1928	17,619,293	15	97,738,147	82	3,281,649	3	118,639,090
1929	17,451,585	14	101,089,474	83	3,562,684	3	122,103,743
1930	11,461,175	12	77,936,688	82	5,932,867	6	95,330,730
1931	9,135,663	11	70,897,756	84	4,539,937	5	84,573,356
1932	14,812,045	14	85,022,314	82	4,012,153	4	103,846,512

Table 5

PASSENGER AND FREIGHT TRAFFIC INDEX  
NUMBER OF S.M.R.

Year	Passengers		Freight	
	Passengers	Revenues	Freight (Metric Tons)	Revenue
1907	100 (1,512,231)	100 (3,594,239 Yen)	100 (1,348,493)	100 (6,160,274 Yen)
1908	124	86	176	155
1909	144	90	240	182
1910	155	91	265	189
1911	209	119	317	202
1912	238	139	315	226
1913	274	141	289	262
1914	239	122	384	285
1915	245	135	394	280
1916	292	168	419	323
1917	387	227	489	386
1918	495	304	561	493
1919	613	396	679	752
1920	537	408	683	1,037
1921	458	339	700	968
1922	506	345	810	1,128
1923	579	374	900	1,178
1924	577	380	981	1,250
1925	602	404	1,012	1,307
1926	548	423	1,226	1,453
1927	546	448	1,367	1,527
1928	642	490	1,433	1,587
1929	688	486	1,379	1,641
1930	537	319	1,127	1,265
1931	419	254	1,146	1,151
1932	569	412	1,229	1,380

As shown in the foregoing tables, the passenger service revenue of the South Manchuria Railway increased five times in the past twenty years,

while the freight revenue increased twelve times. The railway's revenue has always been much larger than expenditure, contrary to the condition of the Chinese Eastern Railway as is later explained. Even excluding such boom years as during the Great War when nearly seventy percent of the total revenue was net income, the railway has shown in the past sixteen years that generally sixty percent of the total revenue represented the net income. Particularly when this is compared with the financial results of other Manchurian railways mentioned hereafter, its prosperity may be understood. Such a phenomenal result has been due to the fact that not only does the railway pass through the political and economic centres of Manchoukuo, but also it monopolizes cargo shipments by means of its feeder lines. This monopolistic position of the railway was threatened by the railway policy of the former Mukden Government prior to the outbreak of the recent incident as already stated.

Some explanation should here be given regarding the years which showed abrupt increases or decreases in the railway revenue of the South Manchuria Railway. The great reduction in the passenger revenue in 1914 was due to the suspension of the Europe-Asia rail communication, and also to the decrease of the third class Chinese passengers because of the reduced silver price. The sudden rise of silver and the war boom in Japan in 1916 greatly increased the passenger and freight revenue. The financial panic in Japan in 1920 and 1921 greatly reduced the revenue of the South Manchuria Railway (the largest items of exports from Manchoukuo are soya beans and coal, and their export is greatly influenced by the agricultural condition of Japan, where beancake is used as fertilizer, and also by the industrial situation of Japan and China). The increase of revenue in 1929 was due to the Chinese Eastern Railway controversy which caused the shipment by the South Manchuria Railway of freight which would have been under ordinary conditions shipped by the Chinese Eastern Railway to Vladivostok. The great reduction in revenue in 1930 was caused by the serious fall of the silver price, the competition with Chinese railways, and the world economic depression.

#### Japanese-Manchurian Joint Railways

**Chinfu (金福) Railway.**—This railway runs from Chinchou (金州) in the Kwantung Leased Territory to Chengtzutuan (城子疃), on the border of the Leased Territory, a distance of 102 kilometres. It is operated by the Chinfu Railway Company, a joint Japanese-Manchurian enterprise,

with a capital of ¥4,000,000. The construction was commenced in May, 1926, and the line was opened to traffic on October 1, 1927. This line was planned for stimulating economic development and maintaining peace and order in the northeastern section of the Kwantung Leased Territory, but its business results have not been satisfactory due to the competition of coastwise transportation. In 1927 and 1928, the percentage of expenditure to revenue ranged between 80% and 90%, or two to three times the percentage of the South Manchuria Railway.

**Tientu (天圖) or Tienpaoshan-Tumen Light Railway.**—The construction of this railway had been proposed by Japanese ever since 1908 for transporting the silver and copper ores of the Tienpaoshan (天寶山) mountain and also for facilitating communications between the Korean border and the Chientao district, but the project did not materialize for a long time as the negotiations with the Chinese authorities made no progress. It was in May, 1922, that the construction was finally commenced, and the line was partially opened to traffic in October, 1923, the remaining section being opened in November, 1924. It was operated by a stock company with a capital of 4,000,000 yuan, the shares of which were equally divided between the Kirin Provincial government and Japanese.

This railway is to be reconstructed as the Tuntu Southern line, and borrowing from the South Manchuria Railway Company about 6,000,000 yuan, required for purchasing the line, Manchoukuo entrusted its operation to the South Manchuria Railway Company. The South Manchuria Railway Company is shortly to reconstruct the railway to the gauge of 4 feet 8½ inches, and connect it with the North Korean Railway at Sampo on the other side of the Tumen River, in order to open a thorough route to the port of Seishin, Korea.

**Hsichien (溪城) Light Railway.**—This railway was first planned to be constructed from the Antung-Mukden line of the South Manchuria Railway to Chienchang (城廠), but at present it runs only to Niuhsintai (牛心臺), a distance of 26 kilometres including a branch line. The purpose of this railway is to carry iron ore and coal produced in its neighbourhood. The Hsichien Railway Company (溪城鐵路公司) is established with a capital of ¥570,000, 70% of which is invested by the South Manchuria Railway, and 30% by the Penhsihu Colliery and Iron Works, a joint Manchurian-Japanese corporation. Its business returns for the past ten years show that while the annual revenue was about ¥110,000, the expenditure was ¥80,000 to 90,000, leaving only ¥20,000 to 30,000.

## Soviet-Manchoukuo Joint Railways

**North Manchuria Railway (Chinese Eastern Railway).**—The circumstances that led to the construction of the Chinese Eastern (North Manchuria) Railway and the surrender of a portion of it to Japan in 1905 have already been described. Against the plans of the United States of America to advance into Manchuria after the close of the Russo-Japanese war, Japan and Russia twice concluded agreements, i.e., in 1910 and 1917, and thus adopted a united front for maintaining and protecting their respective rights in Manchuria, with the support of Great Britain and France. Soon after the outbreak of the Russian revolution in 1917, and before the acquisition of administrative power by the Bolsheviki, the United States, which had gained enormous wealth during the war, again attempted to make a huge investment in various Russian railways and particularly in the Chinese Eastern Railway. Concluding an agreement with the Kerensky government, the United States despatched a party of 280 engineers to Vladivostok, but soon the outbreak of the Bolshevik revolution put a stop to the American scheme. At the time of the outbreak of the Russian revolution and while the Allied Forces were in Siberia, the Chinese Eastern Railway was under the joint control of the Allied Powers, but with the withdrawal of the Japanese troops from Siberia in October, 1922, it was restored to Russia.

In July, 1919, Soviet Russia issued the so-called Karakhan declaration, and this, showing its desire of making a great concession to the Chinese people, heightened the anti-imperialism movement in China. This declaration was partially embodied in the Soviet-Chinese agreement of May, 1924, and also in the Soviet-Mukden agreement of September, 1924. The main points of these agreements were as follows:

- (a) The Chinese Eastern Railway was made a purely commercial enterprise; the judicial, administrative, military, policing, taxation and land affairs which formerly were controlled by the Railway were restored to China, except matters appertaining to the railway's own operation.
- (b) The time limit after which the Chinese Government would gain possession of the railway free of charge was shortened from eighty years to sixty, with a provision that the time limit might further be reduced by mutual agreement of China and Russia.
- (c) The right of redeeming the railway at any time upon the payment of a mutually agreed amount was given to China.

- (d) In the management of the railway, China and Russia would have equal rights, in principle.
- (e) Respecting the future of the railway, interference by any third party was to be rejected.

The agreement also set forth that for deciding details another conference was to be opened within six months. But the said agreement on details has not yet been reached. Russia and China have been unable to hold a conference to decide details as stipulated in the above agreement because of the conflict between the Mukden government and the Government of China in Peking; the Russian protest against the construction of the Taonan-Angangki Railway; the protest of the Mukden government against the support given by Russia to Kuo Sung-ling (郭松齡) in his revolt in 1925; and the attack on the Soviet Legation at Peking in April, 1927. A conference was once held in May, 1927, as Russia proposed to make some concessions, but as the opinions of the two countries were so widely different, it broke up without coming to an agreement.

As the influence of the Nationalist movement began to extend to Manchuria, the Mukden government attempted, in July, 1929, to recover the Chinese Eastern Railway (now North Manchuria Railway) by force. Because of this attempt, there developed in the border districts several armed conflicts between the two countries. As the Powers made interfering declarations, the two countries considered it disadvantageous to tolerate any interference by a third party, and stopping the armed conflicts, commenced direct negotiations. Many conferences were broken off, but finally, on December 22, 1929, the Khabarovsk Provisional Agreement was signed, mainly agreeing to restore the status quo ante until a decision could be reached at a future formal conference. The formal conference was opened several times, but no result was obtained. Thus while the matter was left still undecided, the recent Manchurian incident developed.

**Negotiations for the Transfer of the North Manchuria Railway.**—Respecting the North Manchuria Railway there were constant controversies with the U. S. S. R. even in the days of the Chang Hsueh-liang government, and since the establishment of Manchoukuo there have occurred similar controversies. Such controversies might lead to a serious diplomatic crisis, according to development. To remove the causes of such controversies, the U. S. S. R. expressed to the Japanese Ambassador stationed at Moscow in May, 1933, the desire to transfer the railway and all its attendant rights to Japan or Manchoukuo. Believing that if the railway is to be transferred, it should go into the hands of Manchoukuo, Japan

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decided to act as intermediary in the negotiations between Manchoukuo and the U. S. S. R. As Manchoukuo also showed willingness to negotiate for the transfer, the representatives of Manchoukuo and the U. S. S. R. opened negotiations in Tokyo on June 26, 1933, through Japan's good offices.

Previous to the opening of the negotiations, the Nanking Government issued a protest to the U. S. S. R. on May 9 respecting the transfer of the railway, and the U. S. S. R. refuted the protest. The protest and refutation are of much interest in interpreting the international position of Manchoukuo, and are given here in translation :

STATEMENT OF THE NANKING GOVERNMENT (May 9, 1933)

"Recently there seem to have arisen various problems respecting the condition and control of the Chinese Eastern Railway, but those that possess proper rights and interests in the said railway are only the Republic of China and the U. S. S. R., and the right the Republic of China possesses in respect of the railway cannot be permitted to be destroyed or hindered by whatever other nation or nations concerned. We wish to particularly point out that any infringement of China's rights by a nation that has not the foundation of lawful existence or that has illegally obtained the railway districts should never be permitted. Furthermore, all problems concerning the Chinese Eastern Railway are to be settled according to the Soviet-China agreement of 1924, and are to be decided exclusively by the U. S. S. R. and China, needless to say. All new agreements formed without the consent of China regarding this important transportation means are infringement of the Soviet-China agreement of 1924, and consequently will be considered null and void and the Chinese Government absolutely will not recognize them."

REFUTATION BY FOREIGN AFFAIRS COMMISSAR LITVINOFF OF  
THE U. S. S. R. (May 11, 1933)

"It is a fact that when I conferred with Ambassador Ota on May 2, we discussed the distressing situation caused by the activities concerning Manchoukuo recently, and the dangerous situation as to the relations between the Soviet and Manchoukuo and Japan. Also at the conference we discussed possible methods for the solution of the controversies, and then I proposed the purchase of the Chinese Eastern Railway by Man-

choukuo as one effective method. Then the Chinese Government protested to the Soviet Government that the Chinese Eastern Railway should not be sold to any one other than the Chinese Government, and it is a fact that the Chinese Ambassador, Yen Hui-ching, submitted to us such a memorandum. The ground of argument used by the Chinese Government does not conform to the formal duty of the Soviet Government or the actual condition; the Soviet-China agreement and the Mukden-Soviet agreement do not bind the right of the Soviet Government in respect of the sale of the Chinese Eastern Railway to any one, particularly to one that actually exists in Manchuria and exercising the rights according to the Soviet-China and the Soviet-Mukden agreements. Far more important is the fact that the Chinese Government and officials under its control have suspended being the Soviet's partner in the Chinese Eastern Railway already for eighteen months. The Chinese Government is in the position of not being able to exercise the rights and obligations under the Soviet-China and the Soviet-Mukden agreements. This condition was caused by reasons wherewith the Soviet Government is unconcerned. Already for more than eighteen months there has been no representative of the Chinese Government on the Board of Directors of the Chinese Eastern Railway. The Chinese Government cannot examine a suit concerning an act of infringement of the rights and interests of the Chinese Eastern Railway in relation to Manchoukuo, nor take any step for the regular operation of the said railway. The Chinese Government, which has not observed the duty stipulated in the Soviet-China and the Soviet-Mukden agreements for more than eighteen months has no right to insist upon the above two agreements formally or practically. When the Chinese delegate, Yen Hui-ching, discussed with me restoration of the diplomatic relations between the Soviet and China at Geneva, he proposed to exchange a memorandum that the Soviet-China and the Soviet-Mukden agreements should be inviolable. I agreed to his proposal, but insisted to add the condition, "as long as changes in conditions in Manchuria do not make execution of the two agreements by the Chinese Government impossible." Mr. Yen rejected this condition, probably because he thought that execution of the terms of the two agreements would be impossible. The above facts will prove the irrationality of the protest made by the Chinese Government, I believe.

"Then what is the motive for selling the Chinese Eastern Railway? The railway in Manchuria was constructed by the Tzarist Government for imperialistic objects, but the present government has no such objects.



"After the October Revolution, the Chinese Eastern Railway lost its aggressive value to the people of former imperial Russia. But the railway itself was constructed by the sweat and blood of the people living in Russia, and therefore the Soviet Government made it its duty to protect the properties of the railway. The Soviet Government was prepared to sell the railway to China, but China had no power to buy it. The Soviet Government, which perfectly retained the property right in the railway, made it a commercial enterprise. Recognizing the fact that it is laid within a foreign territory, the Soviet Government made it a joint operation with the sovereign power of the territory, to divide the profit equally. But the Chinese Eastern Railway has become the source of controversies among the three nations, the Soviet, China, and Manchoukuo. In 1930, negotiations were opened with Mr. Mo Te-hui, Chinese representative at Moscow, but were suspended on account of the Manchurian incident. Now the question of the sale of the Chinese Eastern Railway again has come to the fore. The sale of the railway was proposed at this time also because of the above-mentioned considerations. Our proposal is part of the new manifestation of the love of peace of the Soviet Government. Those who oppose this proposal will be only those who desire the relations between Japan and the U. S. S. R., and between Manchoukuo and the U. S. S. R. to turn worse."

Subsequently the representatives of Manchoukuo and the U.S.S.R. held their first session of the negotiations on the sale of the North Manchuria Railway (C. E. R.) at Tokyo on July 26, 1933. Since then several formal and informal sessions were held, but up to the present, no agreement has been reached on the transfer of the railway.

The points upon which the two sides differ are mainly as follow :

(A) Question of the right of ownership. The U.S.S.R. insists that the railway and its attendant rights which are the objects of transfer are solely owned by the U.S.S.R. Manchoukuo denies it.

(B) Liabilities. The U.S.S.R. proposes to transfer all assets and liabilities of the railway, but Manchoukuo refuses the transfer of the responsibilities for the right of claims of all shareholders, owners of debentures and other creditors, originating prior to March 9, 1917.

(C) Price. At first the U.S.S.R. set the price at 250,000,000 gold roubles, and demanded the exchange rate of ¥1.04 for one gold rouble. But Manchoukuo insisted on 50,000,000 Japanese yen. From the proposals by the two sides, it was not clear whether the Japanese yen were to be gold yen or notes, but it is believed that both sides purposely did not

make this point clear (at that time the note yen fell below 40% of the gold yen). After several sessions the U.S.S.R. proposed, on August 4, to reduce the price from 250,000,000 gold roubles to 200,000,000 gold roubles. Then at an unofficial session on August 12, the U.S.S.R. expressed the wish to calculate the gold rouble at the exchange rate of ¥1.04 in the note yen. Manchoukuo did not agree to the proposal, and firmly insisted to make the exchange rate at 25 sen in notes for one rouble (at 25 sen, ¥ 50,000,000 would become 200,000,000 roubles). The Soviet side regarded this exchange rate as unjust, and thus the negotiations are at a standstill, no agreement having been reached up to the present.

The business results of the railway are as shown in the following tables :

Table 6  
RAILWAY REVENUE AND EXPENSE OF NORTH  
MANCHURIA RAILWAY (C.E.R.)

	(Gold Roubles)			
	Railway Revenues	Railway Expenses	Operating Ratio %	Net Surplus
1913 .....	21,166,062	14,759,359	54.2	6,406,703
1914 .....	22,634,045	15,362,713	67.9	7,271,332
1915 .....	39,362,869	17,581,506	44.7	21,781,363
1916 .....	—	—	—	—
1917 .....	—	—	—	—
1918 .....	—	—	—	—
1919 .....	—	—	—	—
1920 .....	59,498,765	50,972,743	85.7	8,526,023
1921 .....	39,906,249	37,582,660	94.2	2,323,589
1922 .....	37,354,692	26,265,645	70.3	11,089,047
1923 .....	36,113,303	24,334,133	67.4	11,779,170
1924 .....	37,474,568	21,849,492	58.3	15,925,377
1925 .....	48,529,374	24,137,641	49.7	24,361,733
1926 .....	55,488,821	27,326,314	49.0	28,162,508
1927 .....	60,239,534	40,283,475	66.7	20,094,249
1928 .....	64,711,030	40,239,241	62.2	24,471,789
1929 .....	70,112,639	32,760,832	46.7	37,351,807
1930 .....	49,921,501	28,629,185	57.3	21,292,316
1931 .....	40,588,723	22,842,994	56.3	17,745,729
1932* .....	46,825,111	20,685,672	44.2	26,139,439

\* Data for 1932 are preliminary.

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Table 7  
RAILWAY REVENUES OF NORTH MANCHURIA RAILWAY  
(C.E.R.) CLASSIFIED

(Gold Roubles)

Year	Passenger Revenues		Freight Revenues		Other Revenues		Total
	%	%	%	%			
1903	4,553,294	29	7,764,142	48	3,677,984	23	15,995,420
1904	4,751,632	20	15,580,219	66	3,388,154	14	23,720,005
1905	5,894,491	17	23,277,961	69	4,733,451	14	33,905,903
1906	7,216,390	25	13,957,613	48	8,004,056	27	29,178,059
1907	3,988,146	23	8,913,200	53	4,082,818	24	16,984,164
1908	3,473,984	23	8,640,714	58	2,826,859	19	14,941,557
1909	3,395,763	22	9,155,019	59	2,985,528	19	15,536,310
1910	3,891,600	22	11,229,071	63	2,583,464	15	17,704,135
1911	3,568,787	18	12,859,601	66	3,021,201	16	19,449,589
1912	4,988,498	24	11,953,537	59	3,410,989	17	20,353,024
1913	5,928,315	28	13,862,531	66	1,375,216	6	21,166,062
1914	6,031,035	27	14,986,387	66	1,616,623	7	22,634,045
1915	5,673,306	14	29,498,932	75	4,190,631	11	39,362,869
1920	11,898,333	20	45,944,463	77	1,655,969	3	59,498,765
1921	9,268,632	23	28,678,977	72	1,958,640	5	39,906,249
1922	8,575,380	23	25,357,253	68	3,422,060	9	37,354,692
1923	8,384,949	23	26,036,266	72	1,692,088	5	36,113,303
1924	7,603,159	20	27,232,037	73	2,639,372	7	37,474,568
1925	7,887,222	16	34,290,417	71	6,351,735	13	48,529,374
1926	9,916,048	18	39,823,488	72	5,749,286	10	55,488,821
1927	12,593,628	21	44,774,262	74	2,871,644	5	60,239,534
1928	14,088,881	22	46,588,438	72	4,033,711	6	64,711,030
1929	14,975,194	21	51,365,857	73	3,771,589	6	70,112,640
1930	10,460,694	21	37,199,319	74	2,261,488	5	49,921,501
1931	5,787,089	14	31,787,290	78	2,967,233	8	40,541,612
1932*	5,704,356	13	35,659,123	85	820,453	2	42,183,932

Table 8  
TRAFFIC INDEX NUMBERS OF NORTH MANCHURIA  
RAILWAY (C.E.R.)

Year	Passengers		Freight	
	Passengers	Revenues	Freight	Revenues
1903	100	100	100	100
1904	142	104	246	201
1905	163	129	502	300
1906	131	158	223	180
1907	66	88	125	115

(2,031,741) (4,553,294 Roubles) (421,809 M. Tons) (7,764,142 Roubles)

\* Data for 1932 are preliminary.

Year	Passengers		Freight	
	Passengers	Revenues	Freight	Revenues
1908	50	76	141	111
1909	58	75	224	118
1910	67	85	275	145
1911	60	78	367	166
1912	82	110	292	153
1913	76	130	309	179
1914	80	132	284	193
1915	80	125	456	380
1916	102	—	—	—
1917	120	—	—	—
1918	100	—	—	—
1919	134	—	—	—
1920	116	261	397	592
1921	112	204	490	369
1922	119	188	589	327
1923	125	184	665	335
1924	114	167	718	351
1925	126	173	803	442
1926	167	218	1,004	513
1927	223	277	1,161	577
1928	253	309	1,292	600
1929	246	329	1,329	662
1930	174	230	999	479
1931	97	127	932	409
1932*	114	125	799	459

The capital of the Russo-Asiatic Bank, the main operating body of the railway, was only 5,000,000 roubles. The railway construction funds required up to 1903 reached a total of more than 375,000,000 roubles. The total invested capital up to January 1, 1928, was said to have been 398,000,000 roubles. In the past few years, the railway showed an annual profit of between twenty and forty million roubles, but besides the ordinary operating expenses there were also many large special expenditures. For instance, the special expenditures reached 14,000,000 roubles in 1926, and 19,000,000 roubles in 1927. There were also large special expenditures in 1928, 1929, and 1930 spent in connection with the Sino-Soviet controversy, large amounts having been given to Chinese officials; thus the special expenditures in these years reached 50,000,000 roubles, 34,000,000 roubles, and 22,000,000 roubles respectively. Because of such enormous special expenditures, the railway showed a loss of 25,000,000 roubles in 1928, a

\* Data for 1932 are preliminary.

profit of only 3,000,000 roubles in 1929, and again a loss of 700,000 roubles in 1930. The loss incurred in 1930 was due more to the reduced revenue caused by financial depression than to the increase of special expenditures.

The revenue of the South Manchuria Railway is influenced by the economic condition of Japan as already stated, and the revenue of the North Manchuria (Chinese Eastern) Railway reflects the political relations of Russia in Manchuria. The business returns of the Chinese Eastern Railway showed a sudden increase in 1904 and 1905, the second and third years of its operation, but this was due to the transportation of troops and munitions for the Russo-Japanese War. In 1905, 90% of the passengers and freight carried were for military purposes. Consequently passengers and freight carried free of charge were quite numerous; taking the index figures for 1903 as 100, the number of passengers carried in 1904 was 112 and in 1905 112 while freight was 246 in 1904 and 502 in 1905.

The increase of revenue at the beginning of the Great War was also due to the transportation of large quantities of munitions and war materials to European Russia. Statistics during the four years of chaos caused by the Russian revolution are not available. But the passenger and freight revenue of 1920 showed an extraordinary increase, probably due to the transportation of the Allied troops, other than Japanese, in their withdrawal. It was after 1923 that the business of the North Manchuria Railway resumed normal condition (Japanese troops were withdrawn from Siberia in October, 1922). The effect of the Soviet-Mukden agreement of September, 1924, was reflected in the sudden increase of revenue in the following year and after. During the Soviet-Chinese controversies of 1928 and 1929, the net profit of the railway was very small despite the increase of the operating revenue as already explained.

#### Manchoukuo Railways

**Peiping-Mukden Railway.**—The Peiping-Mukden (formerly called Peking-Mukden) Railway consists of the main line between Peiping and Mukden, and four branch lines running to Tungliao, Yingkow, Peipiao (北票) colliery, and Hulutao (葫蘆島), with a total length of 1,344 kilometres. The sections in which British capital is invested are the line between Peiping and Hsinmintun and the Yingkow branch. But since the beginning of 1932 the main line between Peiping and Mukden is

divided at Shanhaikwan by the new Government of Manchoukuo and China, and the Manchurian section of the Peiping-Mukden Railway is called the Fengshan (奉山) or Mukden-Shanhaikwan Railway. The management and operation of this railway were entrusted to the South Manchuria Railway Company on March 1, 1933.

The British investment of 2,300,000 pounds sterling made in 1899, the Double Track Loan of 500,000 pounds sterling in 1921, and the Chinese Government investment of 23,900,000 yuan (as standing at the end of 1928) constituted the total capital of this railway. But the British investment is being repaid annually out of the railway's revenue, and at the beginning of 1933 there was left only an unpaid balance of 690,000 pounds of the 1899 loan and 191,047 pounds of the 1921 loan. Besides the annual redemption of the British investment, the construction costs of the Tahushan-Tungliao Railway and the Chinsien-Peipiao Colliery line were paid out of the railway's revenue; also the construction of the Hulutao harbour was contracted for on the security of the revenue of this railway. Thus the business condition of the railway is flourishing.

Table 9

#### OPERATING REVENUES AND EXPENSES OF PEIPING-MUKDEN RAILWAY\*

	(Yuan)			
	Operating Revenues	Operating Expenses	Operating Ratio %	Net Surplus
1903 .....	4,658,235	2,315,584	49.00	2,342,651
1904 .....	5,946,518	2,542,585	42.00	3,403,833
1905 .....	12,943,384	2,914,102	22.00	10,029,282
1906 .....	12,191,189	3,429,943	28.00	8,761,246
1907 .....	9,944,867	3,686,320	37.00	6,258,546
1908 .....	11,067,677	3,075,567	28.00	7,992,110
1909* .....	14,345,202	4,554,013	31.00	9,791,188
1910 .....	10,928,242	3,474,187	31.70	7,454,055
1911 .....	11,668,628	3,651,133	31.30	8,017,495
1912 .....	13,183,639	3,820,657	28.90	9,362,981
1913 .....	14,655,264	4,375,576	29.86	10,279,689
1914 .....	13,635,393	5,551,282	40.71	8,084,111
1915 .....	15,277,931	7,579,599	49.61	7,698,332
1916 .....	14,809,724	5,953,576	40.32	8,856,148

\* Owing to the change in fiscal year the figures for the year 1909 represent the business returns for fifteen months, namely, from Oct. 1, 1908, to Dec. 31, 1909. The same applies to the following two tables.