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FEB 4-1982

SFPL SEP 26 1984

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Su7le Sun, Kungtu C 1895-

The economic development of Manchuria in the first half of the twentieth century, by Kungtu C. Sun. Assisted by Ralph W. Huenemann. Cambridge, Mass., East Asian Research Center, Harvard University; distributed by Harvard University Press, 1969.

ix, 124 p. maps. 26 cm. (Harvard East Asian monographs, 28)

Bibliography: p. 113-119.

1. Manchuria—Economic conditions. 2. Title. (S  
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HARVARD EAST ASIAN MONOGRAPHS  
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THE ECONOMIC DEVELOPMENT  
OF MANCHURIA IN THE FIRST HALF  
OF THE TWENTIETH CENTURY



THE ECONOMIC DEVELOPMENT OF MANCHURIA IN THE  
FIRST HALF OF THE TWENTIETH CENTURY

by

Kungtu C. Sun

assisted by

Ralph W. Huenemann

Published by the  
East Asian Research Center  
Harvard University

Distributed by  
Harvard University Press  
Cambridge, Mass.  
1969

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The East Asian Research Center at Harvard University  
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adjacent areas. These studies have been assisted by  
grants from The Ford Foundation. 71-31

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## Foreword

The original author of this monograph, Mr. Kungtu C. Sun, was born in Peking in 1895, though his family home was Shou hsien in Anhwei Province. He was educated at Nankai Middle School in Tientsin and subsequently for brief periods during the era of the Republican Revolution at Tsing Hua College in Peking and at T'ang-shan and elsewhere. In 1914-1916 he attended the School of Law at Peiyang University, Tientsin, and in 1918-1922 the School of Economics at Kyoto Imperial University in Japan. After graduation at Kyoto, Mr. Sun served as secretary to financial commissions under the Peking Government in the years 1922-1926, and then joined the National Government at Nanking as a statistical expert in the Legislative Yuan when it was set up in 1927.

This began his long career as a civil servant specialist in statistical analysis and economic planning, first in the Directorate of Statistics at Nanking and then in the National Resources Commission after its establishment in 1936. During World War II he served as chief of the Economic Research Department of the National Resources Commission in Chungking, 1938-1944. He represented the N.R.C. as deputy director of its technical mission to the United States in New York City in 1944-1946 and then again directed its economic research at Nanking in 1946-1948. In 1949 Mr. Sun joined the Statistical Office of the United Nations, retiring to become a consultant in 1955.

In that year the East Asian Research Center at Harvard invited Mr. Sun to prepare a statistical study of agricultural development in Manchuria, drawing upon his own extensive experience in dealing with the Chinese record there as well as his command of the pertinent Japanese materials. This study gradually broadened in scope, partly through consultations with other economists, principally Dr. Alexander Eckstein and Dr. Helen Lamb. In the end, unfortunately, serious illness prevented Mr. Sun from completing the revision of the original manuscript. We therefore commissioned Mr. Ralph Huenemann,

a young economist and China specialist completing his doctorate at Harvard, to transform Mr. Sun's extensive draft into a finished work. On the whole, Mr. Huenemann has succeeded very well at this difficult task. In a few places, however, he was unable to reconstruct Mr. Sun's references; these lacunae are indicated in the footnotes.

Because of his illness, Mr. Sun was unable to write his own preface, but at an earlier date, he had indicated that he especially wanted to acknowledge the assistance of the late Mr. T. L. Yuan, and of Miss Y. P. Pan of the United Nations Statistical Office. Undoubtedly there are other acknowledgments that Mr. Sun would add if he could. The Research Center is indebted to Professors Ta-chung Liu and Dwight Perkins for helpful advice, as well as to Mr. Huenemann for his careful work in making Mr. Sun's valuable contribution available in this form. Having first met Mr. Sun in Chungking in 1943, I should like to express my own personal gratification that this study is now published as a small token of the long-continued research of a devoted and conscientious scholar.

John K. Fairbank

September 30, 1968

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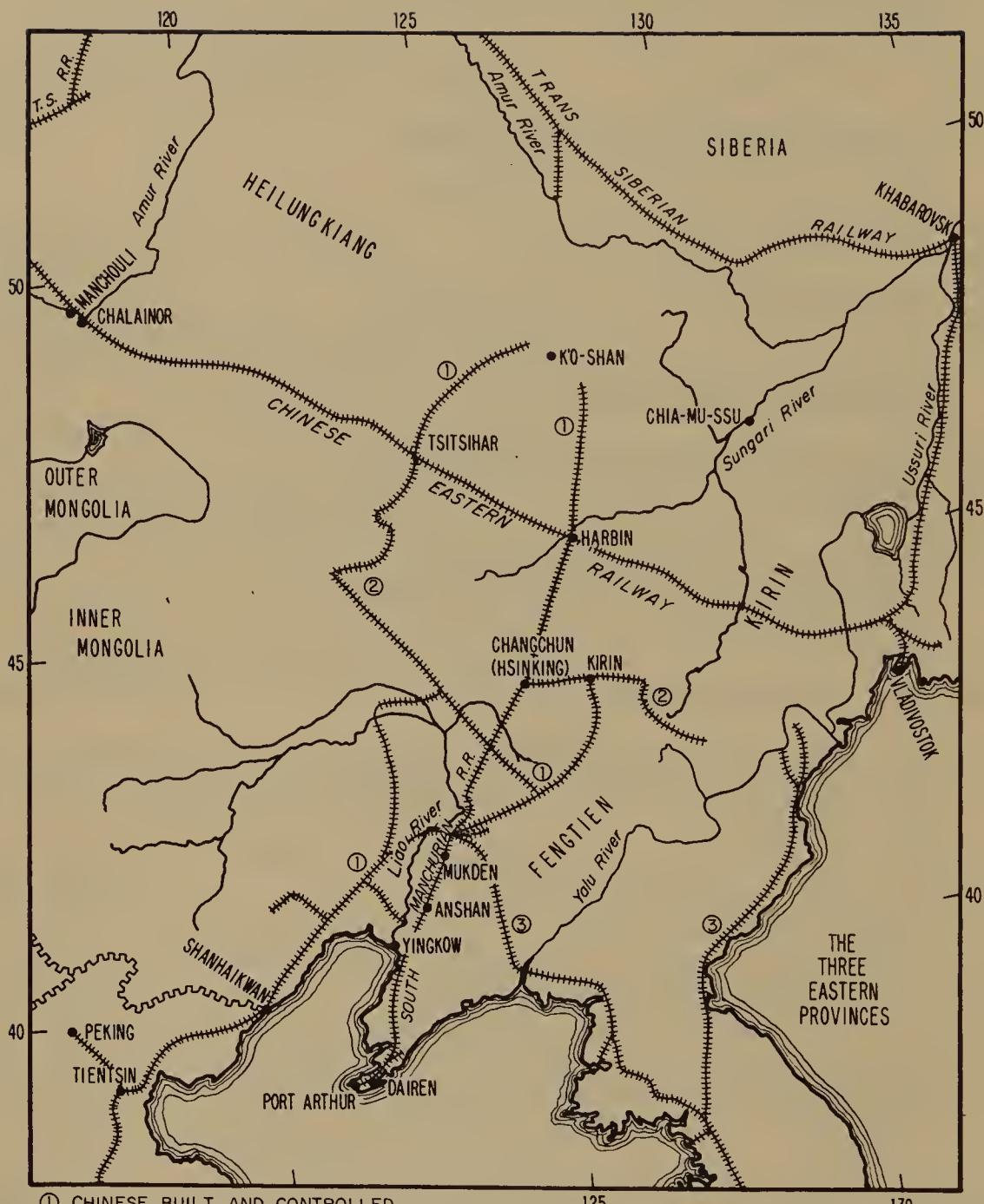
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- (1) CHINESE BUILT AND CONTROLLED  
 (2) CHINESE RAILWAYS, JAPANESE CAPITAL  
 (3) OTHER JAPANESE RAILWAYS

## Chapter I

### THE HISTORICAL SETTING

By the time the Manchus captured Peking in 1644, the Manchu and Ming forces in Liaotung had been at war for more than twenty-five years. Nurhaci, the founder of the Ch'ing dynasty, first attacked the Ming forces in 1617. At first, the fighting was restricted to the Liaotung area, that is, the territory east of the Liao River, which was the center of Chinese agricultural and economic activities in Manchuria. When the war went against the Ming, several hundred thousand Chinese fled inside the Great Wall or to nearby islands. The remaining people, except those who surrendered willingly, were forcibly moved to other places to prevent plots and intrigues. Those who surrendered were organized into *Han-chün*, or "Chinese bannermen," and were incorporated into the Manchu military effort.

When most of Liaotung had fallen under Nurhaci's control, the war was carried to the west bank of the Liao River, where the Manchus concentrated their attack on the city of Ning-yüan. Nurhaci failed to take the city, and died soon afterwards, but the campaign was taken up by his son, Abahai. By forming an alliance with a Mongolian tribe, Abahai succeeded in getting inside the Great Wall, and at one time he even laid siege to Peking, but soon withdrew when Ming rescue forces arrived. However, he made frequent raids on the neighboring districts in Shansi, Chihli, and Shantung—plundering, burning, killing, and carrying away men and cattle. These raids were carried on for almost fourteen years, until Abahai's death. Abahai's son (who became the Shun-chih Emperor) carried on the campaign in his father's place, and in the next year the Manchus, aided by the Ming general Wu San-kuei, entered Shanhaikuan and took control of Peking. The war in Manchuria was ended.

During the fighting, the misery of the people and the losses of life and property were enormous. So, as soon as the Manchus had Peking under their control, they took measures to repair the war damage, particularly in Liaotung. An edict was promulgated in 1653 encouraging people to come back and cultivate the abandoned and waste land in that area.<sup>1</sup> The edict consisted of two parts: the first part promised rewards, in the form of civil and military offices, to persons who succeeded in enlisting farmers to come to Liaotung. The second part concerned the terms offered to the farmers themselves. They were given cattle, seeds, and monthly grain rations until the first harvest. This two-part system came to be known as the policy of "rewarding and encouraging."<sup>2</sup> Later, edicts of a similar nature were issued several times during the reigns of the Shun-chih and K'ang-hsi emperors. However, in the seventh year of the K'ang-hsi period (1668), this system was abolished.

Historians differ in their explanations of the causes that led to the cancellation of the system of "rewarding and encouraging." Some suggest that it was suspended because reasonable results had been achieved, while others think the abolition of the system was due to its ineffectiveness. Thus, Hsiao I-shan, the Chinese historian, cites figures from the *Sheng-ching t'ung-chih* (A comprehensive gazeteer of Liaoning) showing that between the last year of the Shun-chih reign (1661) and the twentieth year of the K'ang-hsi reign (1682) both population and area of taxable land increased five-fold.<sup>3</sup> On the other hand, Inaba Iwakichi, the Japanese historian, quotes a memorandum by Chang Shang-hsien, the civil governor of Fengtien prefect, which described the desolation of both Liaotung and Liaohsi in 1662 in strong terms and emphasized the importance of early rehabilitation.<sup>4</sup> My own view is that the system of "rewarding and encouraging" did not achieve much. Pere Ferdinand Verbiest, who accompanied the K'ang-hsi Emperor on a tour through Manchuria in 1682, wrote that "only a few houses had lately been built within the enclosures of old cities, few of brick

and mostly thatched and of no order" and that "there remained not the least mark of the multitudes of towns and villages that stood before the wars."<sup>5</sup> This was written fourteen years after the cancellation of the "rewarding and encouraging" system.

It must be remembered that after years of war and suffering the inhabitants of Manchuria and those in the neighboring provinces had no confidence in the new regime. Besides, immediately after the Manchus took control of China, there were unscrupulous Chinese who became *Han-chün* by surrendering themselves and their land (*tai-ti t'ou-ch'ung*), and, in their status of bannermen (*ch'i-jen*), they exploited ordinary Chinese by taking their land and goods. It took time before people felt safe to move into Manchuria. The "rewarding and encouraging" system had the effect of opening the door of south Manchuria to immigration, but its effects were felt only slowly. Fortunately, the Manchus kept peace and order for a long time, and this political stability, together with the frequent occurrence of natural calamities in the northern provinces of China due to poor river conservancy, gradually encouraged the flow of Chinese into Manchuria.

At the beginning of the Ch'ing dynasty there were only about two million Chinese in Manchuria, and the Manchu and other tribes totaled altogether about one million.<sup>6</sup> When the Manchus set out to conquer China most of the able-bodied males had to be enlisted, and many Chinese, Mongols, and members of other tribes joined in the campaign. As the work of subjugation extended to south and southwest China, more reinforcements were needed, and garrisons left in Manchuria were summoned inside the Great Wall.<sup>7</sup> Manchuria became largely depopulated.

Most of the Manchus called into China were gathered at Peking, and, to accomodate them, land and houses within 50 *li* of the capital were confiscated. The major, northern part of Peking formed the Tartar city, while the Chinese were allowed to stay only in the south city. Other key cities in the empire were also garrisoned; the Manchu troops were stationed

in a separate part of the city and were supplied with land and houses. Male Manchus attaining a certain age were given grants and grain rations. They were encouraged to practice archery and horsemanship and were forbidden to engage in trade and commerce. The learning of Chinese literature and art was discouraged, at least in the earlier reigns.

In the early Ch'ing period the Manchus were therefore a favored and on the whole a well-to-do class. But as population increased and the civil and military posts for the employment of young males became limited, some of the male youth gradually found it difficult to get positions and became the so-called *sola*, or unemployed. Besides, being regularly supported by the government, without any effort on their part, the Manchus became spendthrifts and pleasure seekers. Some sold or mortgaged their land and houses to the Chinese. (In the early reigns of the Ch'ing dynasty these lands and houses were often redeemed by the government and given back to the Manchus concerned.) Though the purchase of a bannerman's land or house by a Chinese was against the law, somehow the prohibition was circumvented. As early as 1725 the Yung-cheng Emperor sent the following decree to the Administrator of Bannerman Affairs (*kuan-li ch'i-wu ta-ch'en*):

Recently the bannermen have not known how to conduct their household finances. They depend only on grants and rations, they do not try to practice frugality, and they get into the habit of easy and luxurious living. Several times I have told them to be frugal but they seem to have difficulty changing their habits. The late emperor, my father, considering that many of the soldiers had exerted themselves during the war while their families incurred debts, once gave them 5,415,000 taels from the treasury as a bonus. Each family got on the average several hundred taels. But in one or two years they spent all they got. Then some 6,554 thousand additional taels were given to the soldiers, but they soon spent it as before. During my reign, besides giving special bonuses, I have given extra salaries to soldiers several times, each time

to the amount of 350 or 360 thousand taels, but as soon as the funds got into their hands they were spent on food and drink and evaporated within ten days. What good did these bonuses do them?<sup>8</sup>

Again, the Ch'ien-lung Emperor, in the first year of his reign (1736), promulgated a long decree pointing out that the fundamental cause of the poverty of the Peking bannermen was their habit of spendthrift living, with the result that they not only got into difficulty themselves but also often caused difficulty to the public finances by misappropriating public funds when collecting government revenues.<sup>9</sup> Thus, at the beginning of his reign the emperor warned the bannermen not to expect too much from the government.

Although the Ch'ing emperors criticized the bannermen for their laziness and extravagance, they often suggested that the Manchus had originally been straightforward, honest people, who were corrupted only after they began mingling with the Chinese. To prevent the spread of this pernicious influence, the Ch'ing emperors on several occasions tried to limit Chinese migration into Manchuria. In 1740 Emperor Ch'ien-lung ordered Huo Pei, the civil governor of Fengtien prefect, to clear up the floating population in that area.<sup>10</sup> ("Floating population" meant Chinese who were not registered in the *pao-chia*.) He ordered those who desired to stay to apply for registration and those who did not to leave Fengtien within ten years. The prerequisite for registration was not very clear. In the 1740 edict a "personal guarantee" (*ch'ü-jen*) was mentioned, but in a later edict of 1760 the possession of property seems to have been the important qualification. Six years after the edict of 1740, Huo Pei was dismissed because he did not carry out this order effectively, and the military governor of Fengtien and the newly appointed civil governor were ordered to carry out the measure, and also to limit further immigration of Chinese from inside the Great Wall.

In 1750 the ten-year limit expired, and since the clearing operation had not been completed, an edict was promulgated allowing an additional ten years. In 1760, when the twenty-year limit arrived, a new edict was issued, stating that those willing to stay had gladly applied for registration and those not registered had left. It also said that merchants, tradesmen, and personal servants were needed by the Manchus and could be allowed to stay, and it ordered the military and civil governors in Chihli, Shantung, and other provinces to instruct all officials in charge of border paths and seaports that no Chinese except merchants were to be permitted to come to Fengtien.<sup>11</sup> This edict wound up the attempt to clear up the floating population in Fengtien. The results of this policy are indicated by the figures for the male population of Fengtien that are recorded in the *Huang-Ch'ao wen-hsien t'ung-k'ao*. (Encyclopedia of the reigning dynasty). These data are tabulated in Table 1. It is interesting to note that the first decade of the attempt to

Table 1

The Male Population of Fengtien

Year	Population
1661	5,517
1685	26,227
1724	42,210
1747	406,511
1753	221,742
1757	428,056
1762	674,735
1767	713,485
1776	764,440
1780	781,193

Source: *Huang-ch'ao wen-hsien t'ung-k'ao* (Encyclopedia of the reigning dynasty; 1882).

reduce the size of the unregistered population in Fengtien terminated in 1750, and that in 1753 the reported population of the prefect dropped to almost half the figure for 1747. Whether these figures were falsified by the officials in charge to please the emperor cannot be ascertained, but in another four years the population had surpassed the 1747 figure, and it kept on increasing in later years. These documents must have passed through the hands of the emperor; either he pretended not to notice the figures, or else he was a very careless administrator.

At the same time that the Ch'ing rulers tried, with only limited success, to restrict Chinese migration into Manchuria, they also tried, even less successfully, to encourage Manchu resettlement of the area. As early as the reign of the Yung-cheng Emperor (1723-1735), several high officials suggested that idle bannermen in Peking be sent to Manchuria to strengthen the frontier and to relieve their financial difficulties, and such suggestions became more frequent in the early years of the Ch'ien-lung period.<sup>12</sup> But they were not acted upon until 1741, when Liang Shih-cheng, the vice-chairman (*shih-lang*) of the Board of Revenue, memorialized to the effect that the revenues collected by the Board annually ranged between seven and eight million taels in prosperous years and four or five million in lean years, while the various expenditures to be met in Peking amounted to more than twelve million taels. Therefore there had been an annual deficit for several years. The most important item of expenditure was the pay of the bannermen, which often constituted 60 to 70 per cent of the total budget. Yet the bannermen were still poverty-stricken, because their number constantly increased, while they had no trade or income of their own and depended solely on government grants and rations. Liang thought that the government should give serious consideration to the proposals that Peking bannermen be resettled in Manchuria.<sup>13</sup> This memorandum was approved and Jalangga, a grand councillor (*ta-hsüeh-shih*), was sent to Manchuria to explore the land available for this purpose. Meanwhile, after the princes and high officials

consulted among themselves, it was recommended that, inasmuch as Larin and Aletsuka in Kirin were known to have vacant land, one thousand persons should be sent there first as an experiment.<sup>14</sup> This suggestion was approved.

The emperor took much interest in the project and issued many edicts concerning it.<sup>15</sup> In one of these, he pointed out that sending the Peking bannermen to Manchuria as settlers was different in nature from sending Chinese to Manchuria as exiles, and that the settlers should consider themselves as returning to the land of their ancestors and should not consider this a disgrace. He became angry when some of the settlers left Manchuria and returned to Peking. Perhaps some of the bannermen later sold their land to Chinese tenants, but on the whole the experiment seemed a success.

In the reign of the Emperor Chia-ch'ing this policy was continued. Thus, in 1812 a decree was promulgated<sup>16</sup> discussing the increased number of idlers among the Peking bannermen and the abundance of uncultivated land in Manchuria, particularly in Kirin. The resettlement at Larin and Aletsuka during the Ch'ien-lung period was mentioned as a precedent, and it was announced that it was the intention of the court to continue this policy. The governor-general, Sai-ch'ung-a, was ordered to select a suitable site. He later reported that he had located two tracts of land suitable for the purpose, but he was transferred to Chengtu soon afterwards and the work was postponed.

Fu-chün, Sai-ch'ung-a's successor, was enthusiastic about the resettlement projects. But he suggested that, instead of sending the Peking bannermen immediately, the work should be done in two steps. First, idle bannermen already in Manchuria could be selected to cultivate the land and prepare the farmsteads, and then when the Peking bannermen arrived these local colonizers would turn over the larger part of the land to the newcomers but would be permitted to keep a smaller part for themselves. In this way the Peking bannermen would not have to depend on the Chinese for help, and also the local bannermen would be encouraged to become self-supporting.

Another advantage of the system was that the expenses were to be paid out of the provincial surplus and therefore would not have to be met by the Board of Revenue.<sup>17</sup> Fu-chün's memorandum was soon approved, and in 1816 he proceeded to select 1,000 idle local bannermen as colonizers and started the program, at a place renamed Shwang-ch'eng-p'u. In 1817 he suggested that the original plan be enlarged, with the original colony as the central group and 1,000 new families on either side. This expanded plan was also approved and carried out. Fu-chün reported that the colonizing families were very happy, and he was praised and later honored for his work.<sup>18</sup>

But, so far, the achievement consisted only of getting enough local colonizers to start the program. The real object was the resettlement of Peking bannermen. According to Fu-chün's original plan, the actual moving of Peking residents was to begin in 1823 (because in that year the land was due to begin paying taxes, and therefore the financing would be easier). But, when 1823 came, the number of Peking bannermen willing to move amounted to only twenty-eight families. In the next few years the number of families willing to move increased, but in no year did the number exceed one hundred. At the end of fifteen years, when a final count was made, only 698 families had arrived at Shwang-ch'eng-p'u. Many of these had had no experience with farming and fell into serious financial straits. To ease their difficulties, each settler was given an annual subsidy of twelve *ch'uan* (one *ch'uan* being equal to one thousand cash) for the purchase of clothing and implements.<sup>19</sup> After five years this subsidy was to be terminated. A subsidy was also provided for widows, old men, *etc.*<sup>20</sup> There is no record as to how many families stuck to farming and how many deserted and sold their land, but some of them at least must have followed the latter course.

Undaunted by the early reluctance of Manchus in Peking to move to Manchuria, Fu-chün also championed a second migration project. As early as 1821 he memorialized that near Petuna there was a large tract of

land suitable for settlement.<sup>21</sup> The land was flat and very fertile, and it covered an area of more than 200,000 *shang*. He suggested that the plan of Shwang-ch'eng-p'u could also be adopted at Petuna with one difference, namely, that at Petuna Chinese farmers would have to be used to do the preliminary cultivation work for the Peking bannermen because not enough idle Manchus were available locally. At first the court was reluctant to accept this method, fearing that the land would fall permanently into the hands of the Chinese. In the end, however, the emperor approved the proposal, and in 1824 the lieutenant-commander at Petuna was ordered to advertise the scheme and enlist farmers in it. In three years the required number of families was enrolled, and the land was divided into 120 groups with 30 families in each group. But, as late as 1875, not a single Peking bannerman had moved to Petuna, and the land had to be sold to the Chinese farmers at reduced prices.<sup>22</sup> After the Petuna scheme fell through, no serious attempt was made to resettle Peking residents in Manchuria, although one feeble effort occurred in 1876, when it was decreed that 150 families would be permitted to settle a vacant area in Kirin. Only ten families volunteered, and most of them soon abandoned the land.<sup>23</sup>

Thus, after the beginning of the Ch'ing dynasty, the Manchus made little positive contribution to the economic development of Manchuria, except indirectly and incidentally in their capacity as administrators and officials in the central and local government. But they did have a negative effect. In order to reserve space for the increasing number of bannermen, and also for sentimental and other reasons, the strong Manchu emperors of mid-dynasty did their best to keep the Chinese out of Manchuria. Only later, after foreign incursions and domestic rebellions had greatly weakened the government's position, was this policy relaxed. By that time, the futility of trying to resettle the Peking Manchus in Manchuria had become quite evident. Furthermore, the sale of Manchurian acreage to Chinese farmers became an attractive source of revenue for an impoverished government. (It has been estimated

that during the 1850's the Peking grain requirement was never more than one-third filled and that by 1857 it was only one-tenth filled.<sup>24)</sup>

In 1860, when the Taiping Rebellion had been raging for a decade and the emperor had fled to Jehol after European troops occupied Peking, the governors of Kirin, Chingshun, and Juilin asked the throne for permission to sell waste land in order to meet local expenses. They enumerated several pieces of flat, uncultivated land with a total area of 300,000 *shang*, and mentioned that a farmer named Wang Yung-hsiang and his friends had petitioned for permission to cultivate these tracts and had offered to pay a deposit of more than 200,000 *ch'uan*. The governors thought that with this money the expenses of inspecting the frontier could be met. Besides, after five years the farmers would have to pay a tax, which could be remitted to the central government. On the governors' recommendation, the petition was granted.<sup>25</sup> Immediately, the military governor of Heilungchiang, Prince Terpuchin, followed suit and asked that Chinese farmers be allowed to cultivate the unused land in the Mongolshan region, which amounted to more than one million *shang*. It is recorded in the *Hei-lung-chiang chih-lüeh* (An outline gazeteer of Heilungkiang) that after this waste land was opened to cultivation, the new taxes collected amounted to 100,000 taels and more. Since the total military expenditure of Heilungkiang at this time was only 370,000 taels, this act did contribute much to local finances.<sup>26</sup> Following this precedent, large tracts of land were auctioned to Chinese cultivators during the T'ung-chih and Kwang-hsü periods.

While the Ch'ing emperors tried, with some success, to close the southern entrance to Manchuria to Chinese immigration, they left the door wide open in the north. An energetic, expansionist Russia was not slow to take advantage of the situation. As early as the 1650's the Russians had reached the Amur River (or Heilungkiang), but the timely intervention of Emperor K'ang-hsi temporarily frustrated their ambitions. For many years after the Treaty of Nerchinsk (1686), the Russians concentrated their

attention on the furs of Siberia and Alaska, and left Manchuria alone. By the middle of the nineteenth century, however, Russia had returned to the banks of the Amur River. In 1847 Nikolai Muraviev, a young and energetic general, was appointed the viceroy of Siberia—with a hint from the czar that he should pay attention to the Amur. In 1851 the towns of Nikolaivsk and Marlinsk were founded on the lower Amur, and in 1853 Alexandrovsk and Constantinovsk were founded on the seacoast. According to the Treaty of Nerchinsk, all of these settlements were on Chinese territory, but the local Ch'ing officials made no attempt to prevent them or to report to Peking. In 1854 and 1855, Muraviev established forts all along the left bank of the river; the local officials protested but could do nothing, because Peking was caught up in the throes of the Taiping Rebellion. When the Russians called on China to legalize what had been done, Peking had little choice but to accept the Treaty of Aigun (1858), which gave all the territory north of the Amur to Russia. Two years later, in the Treaty of Peking, St. Petersburg demanded and got the land lying between the Ussuri River and the Pacific coast.<sup>27</sup> In the words of David J. Dallin: “What Russia gained in 1858-1860 was a vast territory of almost 4,000,000 square miles, the size of Germany and France combined. The population of the entire region did not exceed 15,000. It was a large emptiness, with no agriculture, no roads, and, of course, no industry.”<sup>28</sup>

Later in the century, continued Russian expansion in this area ran headlong into the ambitions of a newly awakened Japan. After the Sino-Japanese War of 1894-1895, China agreed to cede the Liaotung peninsula to Japan, but Russia, France, and Germany intervened and forced Japan to give up her claim to the peninsula in return for an additional indemnity of 20,000,000 taels. Russia also arranged a joint loan with France to help China pay the indemnity. In return for these favors, Russia was permitted to build the Chinese Eastern Railway across north Manchuria, to connect the Trans-Siberian line with Vladivostok. In 1898, after a show of force, Russia obtained a 25-year lease on Talienshan (Dalny or Dairen) and Port Arthur, along

with the right to build a branch railway connecting the Chinese Eastern Railway with Port Arthur. In 1900, under the pretext of suppressing the Boxers, Russia sent troops to occupy all of Manchuria. All of these Russian gains were to be short-lived, however. After suffering a humiliating defeat in the Russo-Japanese War of 1904-1905, Russia was forced to transfer all of her rights and interests in the Liaotung peninsula to Japan, although she retained her position in north Manchuria.

It is with this situation at the end of the Russo-Japanese War that I will begin my description of the agricultural and industrial development of Manchuria in the twentieth century, since the period just before 1905 was one of military and political strife, during which little real economic development could take place.

Before turning to the twentieth century, however, it may be useful to examine briefly some of the quantitative information that is available for the Ch'ing period. At the beginning of the K'ang-hsi Emperor's reign (1662), trade between Manchuria and China proper was prohibited under the general policy of "sealing the coast" (*chin-hai*), which was adopted to prevent the refugee Ming princes and Koxinga (Cheng Ch'eng-kung) from attacking the mainland or receiving supplies. In 1685 this prohibition was canceled and trade began to revive. In 1709 a team of Jesuit surveyors, who went to Manchuria at K'ang-hsi's request, reported that "the towns are of little note and thinly populated and without any defense except a wall half-ruined or made of earth, though some of them, such as I-chou on the Korean border and Chin-chou on the Kwantung peninsula, are well situated for trade."<sup>29</sup>

No official record of the volume of trade is available for these years. Fortunately, however, the *Shan-hai-kuan chiao-cheng k'ao* (An examination of the Shanhaikwan customs administration) records, for the brief period from 1777 to 1780, the amount of revenue collected in the form of export duties levied against Manchurian soybeans. The figures are as follows:<sup>30</sup>

Year	<i>Customs Revenue</i> (in taels)	<i>Estimated Bean Exports</i> (in <i>shih</i> )
1777-1778	26,881	1,221,867
1778-1779	27,029	1,228,591
1779-1780	28,133	1,278,773

Since the duty on soybeans was 0.022 taels per 100 *shih*, it is possible to form a rough estimate of the volume of beans exported. This is an underestimate, however, since some unknown fraction of the exports were in the form of beancake, which was taxed at the rate of only 0.022 taels per 150 *shih*.<sup>31</sup> It should be noted that according to the *Shan-hai-kuan chiao-cheng k'ao*, Manchurian exports at this date consisted mainly of beans and beancake; no other kinds of grain or pulse are specifically mentioned.

As time went on, the center of Manchuria's trade with China shifted from I-chou and Chin-chou to Ying-k'ou, situated near the mouth of the Liao River. This place, under the misname Newchwang, became in 1861 the first treaty port opened to foreign commerce in Manchuria. The earliest detailed statistics for Newchwang's trade are for the year 1867, and they provide an interesting comparison with the figures for 1777-1780 cited above. The data for Newchwang (given in detail in Table 2, p. 15), indicate that in 1867 the export of beans and bean products, measured in equivalent units, amounted to roughly 2,386,000 piculs. In the year 1779-1780, according to my estimate given above, the amount was about 1,279,000 *shih*. Since one *shih* was equal to 100 *kin*, the *shih* and the picul can be treated as roughly equivalent. Thus, over the 87 years from 1780 to 1867, the bean exports grew approximately 87 per cent, or about seven-tenths of one per cent a year.

It must be admitted that the Newchwang figures, like the earlier one from Shanhakuan, is also an underestimate. Only the commerce carried in steamships was recorded by the maritime customs; goods carried by wooden vessels were not included. However, by 1867 beans and beancakes

Table 2Exports of Soybeans and Bean Products at Newchwang,  
1867 - 1907

(in 1,000 piculs)

Year	Beans	Bean cake	Bean oil	Total	Index Number
1867	1,142	1,221	23	2,386	100.0
1868	808	617	14	1,439	60.3
1869	1,467	923	35	2,425	101.6
1870	974	769	135	1,878	78.7
1871	973	407	13	1,393	58.4
1872	1,236	658	42	1,936	81.1
1873	1,005	554	20	1,579	66.2
1874	1,102	759	26	1,887	79.1
1875	1,740	1,007	12	2,759	115.6
1876	1,421	761	5	2,187	91.7
1877	1,439	792	5	2,236	93.7
1878	2,156	1,925	3	4,084	171.2
1879	1,853	1,801	12	3,666	153.6
1880	2,121	1,351	27	3,499	146.6
1881	2,261	1,443	23	3,727	156.2
1882	2,069	1,613	21	3,703	155.2
1883	2,343	1,716	17	4,076	170.8
1884	2,102	1,876	21	3,999	167.6
1885	2,562	1,805	11	4,378	183.5
1886	1,899	1,480	1	3,380	141.7
1887	2,596	2,031	34	4,661	197.0
1888	2,651	1,865	14	4,530	189.9
1889	1,917	1,893	57	3,867	162.1
1890	2,811	2,624	32	5,467	229.1
1891	4,158	3,064	93	7,315	306.6
1892	4,170	2,819	121	7,110	298.0
1893	3,340	2,327	89	5,756	241.2
1894	3,736	2,660	73	6,469	271.1
1895	2,950	792	33	3,775	158.2
1896	3,836	2,724	88	6,648	278.5
1897	3,873	3,307	75	7,255	304.1
1898	4,221	3,696	108	8,025	336.3
1899	4,711	4,381	160	9,252	387.8
1900	2,518	2,912	224	5,654	236.9
1901	3,534	4,332	209	8,075	338.4
1902	3,431	4,637	282	8,350	350.0
1903	3,425	4,553	112	8,090	339.1
1904	1,826	1,986	72	3,884	162.8
1905	1,484	1,715	26	3,225	135.2
1906	2,063	3,663	96	5,822	244.0
1907	1,143	3,669	84	4,896	205.2

Sources: [Original source presumably the *Trade Reports* of the Chinese Maritime Customs: R.W.H.]

were exported principally to south China (Fukien and Kwangtung), because the Taiping Rebellion had disrupted the markets in central China. For the long voyage to southern provinces, foreign steamers were preferred, and therefore the maritime customs figures probably include most of the bean exports of that period.<sup>32</sup> It is also important to remember that 1780 was a prosperous year in the Ch'ien-lung period, while 1867 was only a few years after the suppression of the Taiping rebels; the comparison is naturally unfavorable to the latter. Nevertheless, even allowing for all of these qualifications, one cannot help thinking that the growth of trade between 1780 and 1867 was quite slow. In my view, this was clearly the result of the Manchu policy of prohibiting Chinese migration to Manchuria.

It is interesting, therefore, to compare the development of Manchuria's trade in the period after 1860, when the ban on migration had been relaxed. For such a comparison it seems that the export statistics for Newchwang are adequate, since Newchwang was the only treaty port in Manchuria until after the turn of the century, when Dairen and other ports were first opened. It is true that some goods were carried by native junks and were not under the jurisdiction of the maritime customs, but their portion in the total trade was not large and grew smaller as time went on. It is also true that some goods, such as livestock and wheat, were traded in the north with Russia, but again the amounts involved were not large.

During this period Manchuria had other exports, such as gold, furs, and ginseng, but the value of beans and bean products constituted almost 90 per cent of the export trade at Newchwang. Since no suitable price data are available for compiling an aggregate index of the value of exports, I believe the simplest way to measure the changes in exports is to compile a series for bean shipments. The bean exports took three forms, namely, unprocessed soybeans, beancake, and bean oil. Usually, a picul of soybeans yielded about 12 or 13 pounds of oil, with two 60-pound beancakes left as residue, but these proportions varied quite a bit, depending on the sophistication of the

presses used to extract the oil.<sup>33</sup> In Table 2, the figures for oil seem a good bit too low by comparison with the figures for beancake, which suggests that some of the oil was not shipped abroad. However, because of the variation that occurred in the proportions between oil and cake, it is not possible to use the data for beancake to estimate the amount of raw beans that went into the presses. As a first approximation, the total figure for beans, beancake, and oil in each year can be used as an estimate of annual bean production.

As may be seen from the table, the growth of bean exports after 1867 gathered momentum only gradually at first but then spurted ahead. In the decade between 1867 and 1876 the average quantity exported each year was 1,987 thousand piculs; in the next decade (1877-1886) the average was 3,675 thousand piculs; in the third decade the average was 5,560 thousand piculs; and then in the three years from 1897 to 1899 the annual average reached 8,177 thousand piculs. This rapid advance was due to the fact that Japan, which formerly depended on fertilizers made of fish waste, found in the soybean cake a substitute that was both cheaper and easier to handle. So, from this time on, Japan was the most important market for Manchurian beancake — until, that is, Japan's domestic chemical fertilizer industry developed in the 1930's.

I have not mentioned the bean export figures for later years (although they are given in Table 2) because they were probably no longer representative of the bulk of Manchuria's exports. Furthermore, after the turn of the century an increasing portion of Manchuria's exports were shipped via Dairen and other ports, or sent north on the Chinese Eastern Railway. If we confine our attention to the period between 1867 and 1890, when Newchwang was the only treaty port and when military disruptions did not distort the data, we find that exports grew at the rate of about 4.9 per cent per annum. This is not a very high rate, but it is much higher than the figure of seven-tenths of one per cent per year observed for the period between 1780 and 1867. This difference serves to show to some extent the

effect of the relaxation of the ban on Chinese immigration after the 1860's. By the end of the century, the dynamic forces of Russia and Japan had entered Manchuria. In the first half of the twentieth century, therefore, there were bound to be new developments – which the following chapters will attempt to describe and evaluate.

## Chapter II

### THE AGRICULTURAL DEVELOPMENT OF MANCHURIA

#### *The Period before 1931*

As described in the previous chapter, international rivalries in Manchuria were greatly intensified as the nineteenth century drew to a close. Each of the three major powers involved—namely, China, Russia, and Japan—tried to strengthen its position in the region. Militarily, China was impotent, but Peking did what it could to encourage migrants to settle in Manchuria, in order to fill in vacant land before it could be occupied by foreigners. The Kuang-hsü Emperor issued an edict in 1887 that abolished all restrictions on Chinese migration into Manchuria,<sup>1</sup> and in the 28th year of his reign (1902) a Waste Land Bureau (*huang-wu tsung-chü*) was set up in Kirin to coordinate the work of land release and distribution. Two years later a similar office, called the Land Development Bureau (*k'en-wu tsung-chü*), was established in Heilungkiang to perform the same functions.<sup>2</sup> The Chinese Eastern Railway was rapidly built by the Russians during the years 1897 to 1901, and both the east-west and southern lines were opened to traffic by 1903. The construction of this railway drew many laborers and merchants into north Manchuria who were ready to become landowners and tillers. The economic build-up of Harbin by the Russians also had a stimulating effect.

The Russo-Japanese War of 1904-1905, despite the disruption that it caused, also contributed in some ways to Manchuria's agricultural development. Both armies bought many of their supplies locally, with the Russians reportedly consuming about 2,033,000,000 lbs. of Manchurian foodstuffs and forage.<sup>3</sup> After the war many Russian firms withdrew from Manchuria, but the situation was soon stabilized by the Russo-Japanese Conventions promising to respect each other's interests. In the south, the Japanese immediately began to re-build and re-equip their segment of the Chinese Eastern Railway, which

they renamed the South Manchurian Railway (often referred to simply as the SMR). They also transformed the quiet bay of Dairen into a major port by 1907. At about the same time the Peking-Mukden Railway, which was built by China with English funds, was completed. These construction activities could not fail to stimulate the general economy.

Also in 1907 the court in Peking, in an effort to meet the Japanese challenge, abolished the traditional Manchu military government of Manchuria, and remodeled the administrative system after the provincial system in the interior of China. Three civil governors, all Chinese, were appointed for the three provinces of Fengtien, Kirin, and Heilungkiang, and a Chinese governor-general was placed above them to coordinate and direct their work. At that time Yüan Shih-k'ai was very influential in Peking, and all four of the new appointees were talented members of Yüan's entourage. The first governor-general, Hsü Shih-ch'ang, later wrote the *Tung-san-sheng cheng-lüeh* (Record of policies in the three eastern provinces), in which he described what he did in Manchuria. It seems that he paid much attention to encouraging migration and the settlement of waste land, that he set up military colonies in regions where Russian pressure was strong, and that he established an agricultural experimental station in each of the three provinces.<sup>4</sup> However, these efforts had little chance to take effect, for in 1908 the emperor and the Empress Dowager died, and Yüan Shih-k'ai and many of his proteges, including Hsü, were soon dismissed from office.

As far as Manchuria was concerned, the period of the 1911 Revolution and of World War I was relatively tranquil. The warlord Chang Tso-lin came to power in 1911, but until the 1920's he stayed aloof from the tempestuous politics inside the Great Wall and followed a policy of "safeguarding the territory and keeping the people in peace" (*pao-ching an-min*).<sup>5</sup> In 1922, however, Chang went to war against the Peking warlord Wu P'ei-fu. A series of wars followed, which ended in 1926 with Chang in control of Manchuria (the non-Japanese areas, that is), the Peking-Tientsin area, and Shantung. All of these military operations naturally involved heavy expenditures. Taxes were increased,

paper notes were over-issued, and the whole political and economic atmosphere became unstable. After 1926, immigrants from China rushed to Manchuria in unprecedented numbers, greatly increasing the pressure on the land. At the same time, the success of Japanese enterprises in the Kwantung peninsula and the SMR zone stirred patriotic Chinese to start competing enterprises—often without much thought about their economic viability. In 1928 the officers of the Japanese army in Kwantung assassinated Chang Tso-lin, in the hope that his son, Chang Hsueh-liang, would be more sympathetic to Japanese ambitions in Manchuria. Tensions continued to mount, however, and soon led to the Manchurian Incident of 1931.<sup>6</sup>

Considering the political turmoil that characterized much of the period before 1931, the agriculture of Manchuria developed at a surprising rate during these years. In general terms, this development is reflected in two interrelated sets of data: the statistics on cultivated acreage, and the statistics on population. Roughly speaking, the population of Manchuria (including both Chinese and non-Chinese) grew as indicated in Table 3. According to these

Table 3  
Approximate Population of Manchuria  
(in millions)

Year	Population
1860-1870	3
1895-1900	9
1906	13
1916	20
1930-1931	31
1939-1940	40
1950	39
1951	41.6

Sources: Chao Kuo-chün, *Northeast China (Manchuria) Today*, (Cambridge, 1953), p. 4; David J. Dallin, *The Rise of Russia in Asia*, (New Haven, 1949); T. Hoshino, *Economic History of Manchuria*, (Seoul, 1920); Waller Wynne, *The Population of Manchuria*, (Washington, D.C., 1958).

figures, during the first three decades of the twentieth century the population grew at an average rate of about 4.2 per cent a year.

This increasing population was absorbed primarily in the agricultural sector, as many idle acres were put under cultivation for the first time. This naturally raised the question: when would the supply of idle land be exhausted? To answer this question, two pieces of information were clearly needed: the amount of land currently in use, and the total amount of arable land available. With respect to land in use, the earliest available estimate is that of Amano Motonosuke for the year 1908. Amano, who was one of the best-known economists attached to the SMR research staff and whose estimate is therefore probably fairly reliable, suggested that the planted area in 1908 was 8,048,000 *cho*.<sup>7</sup> Since one hectare is equal to 1.0083 *cho*, we can put the 1908 figure at about 8 million hectares. (This estimate must be accepted with caution, since Amano did not explain his methods in detail.) In 1919, the South Manchurian Railway published a book entitled *Jinkō kōchi oyobi nōsanbutsu yori mitaru Man-Mō no taisei* (General conditions of Manchuria and Mongolia as viewed from population, cultivated land, and agricultural products),<sup>8</sup> which I shall abbreviate as *Man-Mō no taisei*. This book gives data for 1915, but it is important primarily because of the great influence that it had on the agricultural statistics of the SMR in later years. Therefore a brief description of the methods used in this publication seems necessary at this point.

Baffled by the conflicting figures on population, land areas, and food production that they had extracted from various sources, the SMR research workers began to seek a way of arriving at a consistent set of figures. They felt that the population figures were fairly reliable, but that figures on land area were often seriously underestimated. To correct the reported figures for land area they used population and export data, and the relationship  $XQ = PR + B$ . In this formula X stands for land in use (the unknown quantity), Q is the net output of a unit of land, P is the population, R is the per capita requirement for food crops (including inventories, etc.), and B is the quantity of exports. The term "net output of a unit of land" means the gross output minus

the requirements for seed and feed. In simple language, the equation shows the relationship between the supply and demand for food crops. If the supply just meets the demand, there is nothing left to export. But in Manchuria at that time most places exported some food crops, so the term B is included to represent these exports. From sample studies and other common information it is not difficult to arrive at an approximate figure for Q and R. In *Man-Mō no taisei* the figure for B was obtained from railway transportation statistics and other information on the movement of crops. Thus, by estimating population (P), the SMR staff was also able to estimate land in use (X). It should be mentioned that Japan's ambition was eventually to dominate Manchuria and Mongolia, and therefore the term *Man-Mō* often appeared in the titles of official publications. In making their estimate, the research workers wanted to cover the whole of Manchuria and Mongolia and therefore included Liaohsi and Jehol, as well as some Mongolian banners. So, in comparing the estimates of *Man-Mō no taisei* with the figures given below for 1924 and later, the former must be reduced by an appropriate amount. Therefore I have discounted the *Man-Mō no taisei* figures by fourteen per cent, to yield a final estimate (for land devoted to ordinary crops in 1915) of about 8,945,000 hectares.<sup>9</sup>

After the publication of *Man-Mō no taisei* the Research Department of the SMR seems to have been temporarily satisfied with its estimates, and for the next few years no revision of the figures was made. Meanwhile, the Economic Bureau of the Chinese Eastern Railway (the CER) was very active in research work on the agriculture of north Manchuria. The reporting methods used by the Russians were not very reliable, and the region covered was confined to the area along the CER with some adjoining territory, so the results were of limited usefulness at best.<sup>10</sup> Nevertheless, this CER initiative was quite important, for it spurred the SMR staff to begin their own crop estimation work. Not to be overshadowed by the Russian example, the Japanese decided to do it better. They tried to make their own observations instead of relying solely on voluntary reports from local people, and in geographical scope they tried to cover the whole of Manchuria. (However, they excluded the Kwantung peninsula

and the SMR zone, for which a separate set of estimates was made.) The first attempt was made in 1923 and preliminary results were announced, but they were considered unsatisfactory by the researchers and in later publications of the results the series always started with 1924. According to Professor Amano, who was a senior member of the SMR research staff during these years, the method of keeping one investigator in the same location through the years was a key to the success of the system. This person and his co-workers often spent more than a month in the field each year, taking samples and making observations and checks. Besides relying on its own field staff, the SMR also solicited voluntary information from government organizations, grain merchants, railway station masters, and other informed persons.

In the beginning two crop forecasts were made each year, one in the growing season and the other at harvest time. Soon the number of reports was increased to three, one in the planting period, one during the growing season, and one at harvest time. After the turn of the year, when trade and transportation statistics became available, the earlier estimates were further checked and final estimates made. That is, during the year the SMR made the best estimates it could of the upcoming harvest, or  $XQ$ , and then used the formula  $XQ = PR + B$  to predict  $B$ , the marketable surplus. This helped the railroad to plan the probable pattern of freight movements later in the year. The following year, after the precise figures for  $B$  became known (from railway and customs records), the original estimate of  $XQ$  was corrected. (The influence of the methodology developed in *Man-Mō no taisei* can be clearly seen.) The contents of these different versions often differed considerably, but users of the statistics did not always pay attention to the differences—hence the discrepancies of many quotations. The final estimates given out in the next year were the most reliable of the set, but these final estimates were sometimes changed in later years without any explanation of the causes of the revision. In an attempt to resolve this problem, I have drawn all the data in Table 4 from statistics that were published in the early 1940's, rather than from publications of the 1924-1931 period itself.

Table 4

Area Planted to Ordinary Crops in Manchuria,  
Excluding Kwantung and S.M.R. Zone

(in hectares)

Year	Planted Area
1924	8,322,000
1925	10,314,000
1926	11,196,000
1927	12,070,000
1928	13,072,000
1929	13,127,000
1930	13,063,000
1931	13,733,000

Sources: *The Manchoukuo Yearbook*, 1942; *Manshū nōsan tōkei* (Statistical yearbook of Manchurian agricultural production), 1941.

As indicated above, the figures in Table 4 do not include the Kwantung peninsula or the SMR zone, and therefore they must be adjusted to a common geographical basis before they can be compared with Amano's estimate for 1908 or with the *Man-Mō no taisei* estimate for 1915. For example, in 1931 the planted area of Kwantung and the railway zone was 240,439 hectares,<sup>11</sup> which, when added to the 1931 data given in Table 4, gives a total planted area of about 13,973,000 hectares. It must also be remembered that this figure covers only the area planted with what the SMR statisticians called "ordinary crops," by which they meant cereals and pulses. The excluded crops fell into three categories: garden crops, industrial crops, and feed to livestock. According to data for the period from 1935 to 1942, the acreage devoted to these "extra-ordinary" crops was about seven per cent of the acreage devoted to cereals and pulses.<sup>12</sup> Assuming that the proportions in 1931 were approximately the same, the total area planted in that year was about 14,951,000 hectares. If we accept Amano's estimate for 1908 of 8 million hectares, the

total area under cultivation in Manchuria grew at the average rate of about 2.8 per cent a year during the period from 1908 to 1931.

To summarize much of the preceding discussion: Manchuria's population grew at about 4.2 per cent a year during the first three decades of the twentieth century, while the area under cultivation expanded about 2.8 per cent a year. The question of whether this rather rapid expansion had used up most of the idle land by 1931 remains to be discussed. The first attempt to estimate the pattern of land utilization in Manchuria was made in the book *Man-Mō no taisei*. This early estimate was derived primarily from topographical maps, on the basis of certain assumptions about the percentages of land cultivable at various slopes and altitudes.<sup>13</sup> This relatively crude effort formed the basis of the land statistics used by the SMR staff, who apparently never made any serious attempt to conduct field studies of the actual conditions in the areas where land was lying idle. In the 1930's, however, some on-the-spot investigations were carried out, and therefore the data from this later period are probably somewhat more reliable. To facilitate comparison, Table 5 gives both the *Man-Mō no taisei* estimates and two sets of estimates from the Manchukuo period. The point to be made here is that even according to the relatively pessimistic figures from *Man-Mō no taisei*, Manchuria has 24,899,000 hectares of arable land, of which only 14,951,000 were being cultivated in 1931. There was still considerable room for new settlers.

A variety of crops contributed to the growth of Manchuria's agricultural sector during this period. The soybean and its products remained Manchuria's most important export, constituting 77 per cent of the total value of exports in 1898 and declining slowly to about 59 per cent in 1931.<sup>14</sup> Part of this success must be credited to the Mitsui Trading Company of Japan, which sent a trial shipment of soybeans to London in 1908. It happened that at that time the British oil mills were worried because the supply of other oil seeds was uncertain. Some of the mills tried the soybeans and found them satisfactory. This initial success caused the British mills to rush for this product, and the British market was assured. Later the market was extended to the European

Table 5

## Pattern of Land Use in Manchuria

(in 1,000 hectares)

Year	1915	1939	1940
<b>Land in use:</b>			
Unirrigated	—	—	16,265
Irrigated	—	—	316
Garden	—	—	<u>11</u>
Sub-total	10,402	17,332	16,592
<b>Arable but idle:</b>			
Abandoned	—	—	2,701
Wilderness	—	—	<u>13,653</u>
Sub-total	14,497	15,516	16,354
<b>Uncultivable</b>			
Forest	—	—	31,513
Swamps	—	—	14,598
Alkaline land	—	—	2,355
Other	—	—	<u>33,877</u>
Sub-total	87,167	74,253	82,343
<b>Total area of Manchuria</b>	<u><u>112,066</u></u>	<u><u>107,101</u></u>	<u><u>115,289</u></u>

Sources: For 1915: *Jinkō kōchi oyobi nōsanbutsu yori mitaru Man-mō no taisei* (General conditions of Manchuria and Mongolia as viewed from population, cultivated land, and agricultural products; Dairen, 1919). For 1939: *Manshū nōsan tōkei*, 1939. For 1940: *Tung-pei ching-chi hsiao ts'ung-shu* (Small collection of books on the economy of Manchuria; [place and date uncertain: R.W.H.]). Discrepancy in total area due to minor differences in geographical coverage.

continent, with Holland and Germany importing significant quantities.<sup>15</sup> When World War I began, the demand for fats and vegetable oils grew. After the war, fear of shortages and disturbed trade conditions kept prices at high levels for several years.<sup>16</sup> According to the data in Table 6 (page 29), Manchuria's export of beans grew at an average annual rate of 5.6 per cent from 1908 to 1931. This was certainly one of the primary forces that propelled the Manchurian economy from comparative obscurity to a prominent place in the Far East.

The sugar beet was introduced into Manchuria by Polish industrialists who started a beet sugar factory at Aшиho on the Chinese Eastern Railway in 1907 and taught nearby farmers to plant sugar beets. In 1909 another sugar factory, sponsored by the local government and staffed by German technicians, was established on the bank of the Sungari River opposite Harbin. It was called the Hulan plant. In 1914 the SMR experimental station at Kungchuling began to explore the possibilities of growing sugar beet in the south, and a sugar plant was started by a Japanese company in Mukden in 1917.<sup>17</sup> As sugar prices were very high during World War I, the business was successful and another plant was set up at Tiehling in 1922. But the postwar depression forced the Tiehling plant to shut down in 1926, and in 1927 the Mukden factory also closed. In the north, the Hulan plant operated only intermittently, and closed down completely by 1923. The Aшиho plant lasted longest, but finally gave up in 1928. With imported cane sugar constantly on the increase it was difficult for beet sugar to compete without special protection. For a time there was no beet sugar production, and hence no planting of sugar beet.

The period before 1931 also saw the introduction of modern methods of livestock breeding. Since World War I Japan had set her eyes on the wool production in Manchuria and Mongolia, and in 1918, after a cabinet decision, the Manchurian and Mongolian Woolen Textile Co., Ltd., (Man-Mō Keori K. K.) was set up at Mukden to exploit the wool resources of that area.<sup>18</sup> But the Mongolian wool was coarse and short-fibred; it was only fit for making carpets, simple blankets, and other coarse goods. In 1924 the agricultural experimental station of the SMR at Kungchuling began to carry out extensive

Table 6

Exports of Soybeans and Bean Products,  
1908 - 1931

(in 1,000 metric tons)

Year	Beans	Bean cake	Bean oil	Total	Index number (1917 = 100)
1908	833	565	19	1,417	78.4
1909	739	451	23	1,213	67.1
1910	730	730	38	1,498	82.9
1911	622	677	48	1,347	74.5
1912	550	640	40	1,230	68.1
1913	551	820	45	1,416	78.4
1914	640	730	45	1,415	78.3
1915	890	790	61	1,741	96.3
1916	830	900	83	1,813	100.3
1917	590	1,099	118	1,807	100.0
1918	445	1,189	140	1,774	98.2
1919	720	1,334	139	2,193	121.4
1920	630	1,357	127	2,114	117.0
1921	769	1,426	121	2,316	128.1
1922	1,036	1,652	124	2,812	155.6
1923	1,184	1,868	160	3,212	177.8
1924	1,366	1,692	144	3,202	177.2
1925	1,387	1,597	151	3,135	173.5
1926	1,356	1,940	182	3,478	192.5
1927	1,723	2,000	178	3,901	215.9
1928	2,383	1,557	130	4,070	225.2
1929	2,718	1,415	119	4,252	235.3
1930	1,971	1,520	135	3,626	200.7
1931	2,836	1,898	187	4,921	272.3

Sources: For 1908-1910: T. Hoshino, *Economic History of Manchuria*, (Seoul, 1920). Calculated by adding together the exports of Dairen, Harbin, and Vladivostok. However, a small part of Vladivostok's exports may have originated in Russia, rather than Manchuria. For 1911-1931: *Manshū nōgyō yōran* (A survey of the agriculture of Manchuria; Hsinking, 1940).

Note: This table includes all of Manchuria, not just Newchwang, and is therefore not a continuation of Table 2.

experiments on crossbreeding of the native sheep with better breeds. It finally succeeded in obtaining an improved breed which was the third generation of crossbreeding between imported Merino rams and local ewes. The improved ram yielded an average of 4,581 grams of wool, compared to only 1,610 grams for the native ram.<sup>19</sup> The Kungchuling station was also instrumental in developing improved strains of pigs, poultry, and cattle.<sup>20</sup>

Despite all of these efforts at diversification, the farmlands of Manchuria continued to be used mainly to grow the basic grains and pulses characterized by the SMR staff as "ordinary crops." Unfortunately, as already indicated above, detailed estimates of these crops were not made until 1924. However, even this partial information is very useful, if only because it established a benchmark for judging Manchuria's agricultural performance after 1931. As with the land utilization figures cited earlier, these data must be adjusted by adding the figures for crops grown in the Kwantung peninsula and SMR zone. One further adjustment was also made. The classification "ordinary crops" did not include the peanut, whereas the Kwantung statistics did include this crop. For the sake of homogeneity, the Kwantung data on peanuts have been excluded.

Any attempt to measure total agricultural output soon encounters the difficulties that are commonly characterized by economists as "the index number problem." In an attempt to resolve these difficulties, I have calculated two separate indices of total output, which are given in the last two columns of Table 7. The first of these is a simple unweighted index, based on the total quantity of production shown in the preceding column. The output for 1924 was taken as equal to 100. The second index is a weighted index, with 1937 prices used as weights. That is, a calculation of  $I$  for each year was made according to the formula:

$$I = \frac{\sum p_0 q_1}{\sum p_0 q_0} \times 100,$$

Table 7

Adjusted Production Statistics of Ordinary Crops  
In Manchuria, 1924-1931

(in metric tons)

Year	Soybeans	Other beans	Kaoliang	Millet
1924	3,454,851	185,292	4,479,110	3,042,707
1925	4,184,743	246,545	4,708,556	3,136,354
1926	4,786,476	421,860	4,549,157	2,980,916
1927	4,830,324	446,085	4,504,276	3,225,822
1928	4,848,175	480,644	4,642,633	3,290,016
1929	4,866,494	386,704	4,708,772	3,371,914
1930	5,376,323	377,344	4,806,072	3,324,581
1931	5,240,689	321,390	4,533,419	2,982,815
Year	Corn	Wheat	Paddy rice	Upland rice
1924	1,684,136	805,897	94,560	88,431
1925	1,877,320	962,061	195,145	150,043
1926	1,764,381	908,845	181,008	133,854
1927	1,790,428	1,446,404	140,909	147,305
1928	1,808,139	1,470,707	150,503	144,862
1929	1,715,153	302,729	137,110	156,492
1930	1,714,167	1,385,377	155,921	158,057
1931	1,899,728	1,581,777	170,066	163,041
Year	Other cereals	Total	Index of quantity	Index of value
1924	759,653	14,594,637	100.0	100.0
1925	891,072	16,351,869	114.4	113.6
1926	828,686	16,555,183	113.5	116.6
1927	1,018,171	17,557,724	120.3	124.5
1928	1,260,753	18,096,432	123.9	128.1
1929	1,828,694	18,474,062	126.6	129.8
1930	1,788,232	19,086,074	130.7	135.1
1931	1,862,200	18,775,125	128.5	133.6

*Sources:* For the Kwantung Leased Territory and the SMR Zone: *Minami Manshū Tetsudō Kabushiki Kaisha sanjūnen ryakushi* (A brief history of thirty years of the South Manchurian Railway Company; Dairen, 1937). For the rest of Manchuria: *Manshū nōsan tōkei* (Statistical yearbook of Manchurian agricultural production) for the various years.

where the  $p_0$ 's are 1937 prices, the  $q_0$ 's are 1937 quantities, and the  $q_1$ 's are the quantities of the year in question. As in the previous index, the value for the year 1924 was then set equal to 100. The use of 1937 prices as weights was a matter more of necessity than choice. It was only after 1935, when the currencies of Manchuria were finally unified and the Manchukuo yuan was kept on a par with the Japanese yen, that prices in various parts of the country could be easily compared. Another factor which influenced the choice of weights was that in 1937 and 1938 the Manchukuo Ministry of Industries collected agricultural price data from all districts of the country and published the average values.<sup>21</sup> According to the brief description given, it seems that these were weighted averages, based either on the planted area or quantities of production. At first I thought of averaging the prices for 1937 and 1938, but on comparison I found that most of the prices rose considerably in one year. Nineteen thirty-eight was the year after the outbreak of the Sino-Japanese War, and prices in Manchuria suffered from war inflation. But in 1937 prices were still comparatively stable.

It is interesting that the two indices, one unweighted and the other weighted, correspond quite well with each other and that both indicate a peak of production in 1930. As we will see later, output in the Manchukuo period never regained this 1930 level.

As the preceding discussion has suggested, the growth of Manchuria's agriculture was in large part a result of settling migrants on land that had previously been idle. To put the matter in this way is quite misleading, however, if it suggests that investment played an unimportant part in the process. Investment in agriculture often does not attract the attention it deserves, because much of the work is done by the farmers themselves and many of the purchases are made from current income, without recourse to outside financing. Furthermore, records are frequently minimal or nonexistent. But it would be quite wrong to assume that the amounts involved are negligible. Therefore it seems useful to attempt to assess, however crudely, the role of capital accumulation in the development of Manchurian agriculture.

Before going into the data, the concept of agricultural capital must be made clear. According to generally accepted ideas, agricultural capital consists of the following: land, buildings, farm implements and machinery, livestock, and inventories.<sup>22</sup> There has been some opposition to including land as capital, but most economists now recognize that land and capital have many similarities. Alvin S. Tostlebe, an American economist, has summarized the matter as follows:

The differences between land and other durable producers' goods are easily exaggerated. Granted that the gross acreage of a country or region cannot be altered, it is still possible to change greatly the *productive* acreage and the productivity of the acreage already in agricultural use by means which closely resemble the methods by which buildings and equipment are increased. To the extent that land derives its value from its usefulness in agricultural production ..., its value can be raised by the investment of effort and money to fertilize, drain, clear, or irrigate it, to prevent erosion and soil depletion, or to bring it closer to markets by building roads, railroads, and the like.<sup>23</sup>

In Manchuria, the value of land definitely constituted the major part of agricultural capital.

The earliest study made in Manchuria concerning the average investment per farm was done by E. E. Yashinov, an agricultural expert on the staff of the Chinese Eastern Railway. In 1922-1924 he traveled extensively in north Manchuria and selected 70 sample families to study in detail. He studied many aspects of these 70 farms, but for the present I shall confine myself to the data concerning the property or capital of the farms. Yashinov thought that, in addition to land, buildings, livestock, and implements, the farmers' personal belongings should be included, but in his table describing the investment pattern, he omitted personal belongings and only listed the other items, as follows:<sup>24</sup>

Investment in Seventy Sample Farms  
in North Manchuria, 1922-1924

(in Japanese yen)

<i>Item</i>	<i>Total Investment</i>	<i>Average Amount per Hectare</i>
Land	¥540,097.25	¥280.87
Buildings	49,578.85	25.78
Livestock	70,144.97	46.88
Implements	30,342.70	15.77
Total	¥710,163.77	¥369.30

Yashinov's data were originally expressed in Mexican silver dollars and in *shang*, but for ease of comparison with later estimates, I have converted the units to Japanese yen and hectares, at the rates of \$100(Mexican) = ¥110 and 1 *shang* = 0.737 hectare.

As a further step, Yashinov estimated the total agricultural investment in North Manchuria, by which he meant the region traversed by the CER. According to Yashinov this area, which embraced 50 hsien (counties) and 10,500,000 *shang*, included about 37 per cent of the total land area of Manchuria, 28 per cent of its population, and 24 per cent of its planted area. He calculated the total investment by multiplying the figure for investment per *shang* times the estimated area. I have given a rather lengthy description of his work because his method of estimating total investment on the basis of investment per unit of planted area is a good precedent, which I will follow below.

Just when Yashinov was doing his work in North Manchuria, Professor John Lossing Buck of Nanking University was making somewhat similar but more intensive studies in various parts of China itself, which culminated later in his book *Chinese Farm Economy*.<sup>25</sup> Yashinov's and Buck's studies aroused great interest among the research workers of the SMR. Okagawa Eizo, who was in charge of the SMR's crop-estimating work, was particularly attracted by this kind of study. In his book *Manshū no nogyō* (The agriculture of Manchuria)

he described the methods and results of the two pioneers,<sup>26</sup> and soon he tried to make similar studies himself. Before long these studies became very fashionable, and many organizations began to carry them out. The SMR's experimental station at Kungchuling, which was famous for its technical research, broadened its activities to include economic research in several rural areas. The Manchukuo government's agricultural experimental station at K'o-shan made similar studies in that vicinity. Universities and private organizations also became involved in this work. One important series, entitled *Nōka keisai chōsa* (Studies of the farm household economy), was published by the Agricultural Affairs Section of the Kwantung Administration.<sup>27</sup> This series began with Japanese farms in Kwantung, but it was later extended to Chinese and Korean farms and its geographical scope was widened to include most of Manchuria—especially after 1935, when the Russians sold the CER to the Manchukuo government. Okagawa himself directed much of the research published in *Nōka keisai chōsa*.

The popularity of these rural studies was a result of several factors. One important reason was that Manchuria's agricultural output suffered a severe depression in 1934, for which causes and remedies had to be found if possible. Another reason was that in the 1930's Japan decided to move large numbers of settlers into Manchuria and therefore needed information about the merits and shortcomings of traditional agricultural practices. As a result of the enthusiasm for rural research, there exists a considerable corpus of information about rural investment. Table 8 records the data that were gathered during the years from 1934 to 1936. Although studies were made in both earlier and later years, the inflation of price levels during this period makes it very difficult to combine data that were collected at different points in time. The reasons for choosing the years 1934-1936 are threefold. First, prices were comparatively stable then. Second, it was only at this time that the Manchurian yüan or *hsien ta-yang* was unified with the Japanese yen, thereby making it easy to compare figures recorded in yüan with figures recorded in yen. And third, this was the period when these field studies were still a new idea, which generated excitement and enthusiasm among the researchers; later studies tended to be more routine and uncritical.

Table 8

Total Capital Invested per Cultivated Hectare,  
Calculated from Farm Economy Studies

(in Japanese yen)

A. Kwantung Leased Territory\*  
(Including SMR Zone)

	<u>Case 1</u>	<u>Case 2</u>
Year of study	1934	1935
Land	1,425.39	1,401.30
Buildings	82.37	84.36
Plants (trees)	300.92	180.32
Animals	44.73	49.41
Implements	11.97	9.56
Inventories	36.44	18.32
Other	23.16	39.70
Total	1,924.98	1,782.97

B. South Manchuria

	<u>Case 3</u>	<u>Case 4</u>
Year of Study	1935-36	1935-36
Land	1,277.47	846.07
Buildings	100.00	25.84
Plants	26.42	—
Animals	42.04	23.45
Implements	20.72	14.62
Inventories	57.35	31.15
Other	—	—
Total	1,524.00	941.13

C. Central Manchuria

	<u>Case 5</u>	<u>Case 6</u>
Year of study	1935-36	1935-36
Land	707.00	454.00
Buildings	16.00	22.00
Plants	—	—
Animals	21.00	21.00
Implements	10.00	14.00
Inventories	24.00	27.00
Other	—	—
Total	778.00	538.00

D. North Manchuria

	<u>Case 7</u>
Year of study	1935
Land	190.36
Buildings	8.66
Plants	4.65
Animals	17.56
Implements	4.04
Inventories	8.99
Other	4.43
Total	238.69

Sources: For Case 1: *Shōwa kyōnendo Manjin nōka keizai chōsa hōkoku* (Report on investigations of the Manchurians' rural household economy in 1934; Dairen, 1934). This study covered thirteen farms. For Cases 2 and 7: *Shōwa jūnendo Manjin nōka keizai chōsa hōkoku* (Report on investigations of the Manchurians' rural household economy in 1935; Dairen, 1935). Case 2 covered eleven farms; Case 7 covered an additional eleven. For Cases 3 to 6: *Nōson jitai chōsa narabini nōka keizai chōsa* (Investigations of the situation in the rural villages and of the rural household economy; 1937). Each of these four cases drew on a sample of farms in a particular hsien.

It will be noticed that the results shown in Table 8 differ rather widely as between different geographical regions. This result should not be surprising, since the figures are higher in the older (i.e., southern) parts of the country, where the gradual process of land improvement had been going on the longest. To take account of these geographical differences, it is necessary to calculate total investment separately for each region. The terms south, central, and north Manchuria are not very precise, though they crop up constantly in articles and treatises on agricultural conditions in Manchuria. South Manchuria represents the area settled during the late Ming and early Ch'ing dynasties, when Chinese migration into Manchuria was free or at least not expressly prohibited. It covers the whole of Fengtien province, though some peripheral areas of Fengtien were developed later. Central Manchuria represents the areas in Kirin next to south Manchuria which were released for cultivation when the prohibition on migration was gradually relaxed in the latter part of the nineteenth century. North Manchuria includes the rest of Kirin and all of Heilungkiang—the areas that were settled last. However, the precise boundaries of these three regions are nowhere definitely given. In *Manshū no nōgyō* the cultivated area of Manchuria is given as follows:

Fengtien	4,666,679	hectares
Kirin	4,826,560	"
Heilungkiang	3,799,523	"
Total	13,292,762	"

The question is how to allot the area of Kirin between central and north Manchuria. I have arbitrarily assigned 2 million hectares of Kirin to north Manchuria. In this way the cultivated land of the three regions can be estimated as follows:

	Area (hectares)	Percentage
South Manchuria	4,446,679	34
Central Manchuria	2,826,560	22
North Manchuria	5,799,523	44
Total	13,292,762	100

However, it is preferable to have figures for planted area rather than for cultivated land, although in a single-crop region like Manchuria the two should be very close. According to the 1939 edition of *Manshū nōsan tōkei* (Statistics on agricultural production in Manchuria), the planted area for all crops in 1931 was 13,733,250 hectares.<sup>29</sup> Applying the percentages given above to this figure yields the following estimates for the planted area of the three regions. (As usual, a separate figure for Kwantung and the SMR zone must be included.)

Kwantung	240,439	hectares
South Manchuria	4,685,785	"
Central Manchuria	2,965,009	"
North Manchuria	6,082,456	"
Total	13,943,689	hectares

The next step is to estimate the amount of capital invested per hectare in each region. Basically, this was done by averaging the data in Table 8 by regions, but, since the field studies probably had an upward bias (because participation required a certain degree of sophistication on the farmer's part), some discount had to be made. To be on the safe side I subtracted 20 per cent from the regional averages and arrived at the figures shown below:

Region	Investment per Hectare (in yen)
Kwantung	¥ 1,480
South Manchuria	985
Central Manchuria	525
North Manchuria	190

Applying these rates to the assumed planted areas of the different regions yields the final result—the estimated total amount of capital invested in agriculture in each region, in 1935 yuan or yen. (The two currencies were on a par beginning in September 1935). The results are given in Table 9.

The calculations leading up to the figures in Table 9 involved many assumptions and the use of scattered sample data. Thus, by themselves, the results do not command much confidence, and therefore it seems worthwhile to attempt some independent verification of them. There are two possible

Table 9  
 Total Capital in Manchuria Agriculture in 1931  
 (in 1935 yuan)

Kwantung (including SMR zone)	335,849,000
South Manchuria	4,615,498,000
Central Manchuria	1,566,529,000
North Manchuria	<u>1,155,666,000</u>
Total	7,683,642,000

ways of doing this: one is to compare the figures in Table 9 with an estimate of Manchuria's national wealth that was made by the SMR staff in the 1930's; the other is to consider the figures in the light of what is known about capital-output ratios in agriculture in other countries. I will discuss the SMR estimate first. It was made in 1933, to serve as a basis for planning the taxation system of the newly created puppet state of Manchukuo, and it covered both national income and national wealth.<sup>30</sup> The estimate was for the year 1930. In regard to national wealth it included tangible assets plus or minus international claims and obligations. The prices used were 1930 prices, expressed in terms of the Chinese silver yuan. The wealth in the agricultural sector was listed separately and constituted 80 per cent of the total, as indicated below:

National Wealth of Manchuria in 1930  
 (in 1,000 yuan)

Agricultural items:

Cultivated land	4,264,018
Uncultivated land	446,007
Buildings	349,252
Implements	184,405
Domestic animals	817,293
Domestic birds	3,570
Stables	8,592
Inventories	50,000
Subtotal	6,123,137
Non-agricultural items	1,907,915
Total national wealth	8,031,052

In the original tabulation agricultural inventories were grouped together with the furniture, clothing, and other personal belongings of the farmers, and an estimated lump sum of 300 million yuan was assigned to them. But farmers' belongings are not generally included in agricultural capital, so inventories have to be segregated from them. I have conservatively assumed the value of inventories to be 50 million yuan, and included the other 250 million yuan in the non-agricultural category. The problem that remains is how to compare a figure of about 6.1 billion yuan for 1930 (in 1930 prices) with an estimate of about 7.7 billion yuan for 1931 (in 1935 prices). Unfortunately, only rough and incomplete price indices are available for this period. One such index (that for wholesale prices in Dairen) rose about 18 per cent between 1930 and 1935.<sup>31</sup> Thus, price levels in the two years were not too different, and the similarity between the two figures suggested that they are at least of the correct approximate order of magnitude.

Capital-output ratios, which provide the second test of the conclusions reached in Table 9, can be examined on either a macroeconomic or a microeconomic level. That is, the investment for an entire country can be compared with total national output, or the investment on an individual farm can be compared with the output of that farm. Fortunately, data of both kinds exist for Manchuria. On the macroeconomic level, Table 9 gives Manchuria's total agricultural capital in 1931 (at 1935 prices). Also, the Manchukuo Ministry of Industries gathered county-by-county data on the quantity and value of agricultural output in 1937 and 1938. The totals in current prices were 1,436 million yuan for 1937 and 1,729 million yuan for 1938.<sup>32</sup> Deflated by the Bank of Manchuria index numbers of wholesale prices<sup>33</sup> and then averaged, these two figures suggest that the average agricultural output in 1937-1938 was about 1.2 billion yuan at 1935 prices. Comparing 1931 capital with 1937-1938 output is not very satisfactory, but it does yield a crude estimate for the capital-output ratio of about 6.4. On a microeconomic level, the field studies already cited in Table 8 often included estimates of both total capital and of gross annual receipts. Thus, for Cases 1-4 in Table 8, the capital-output

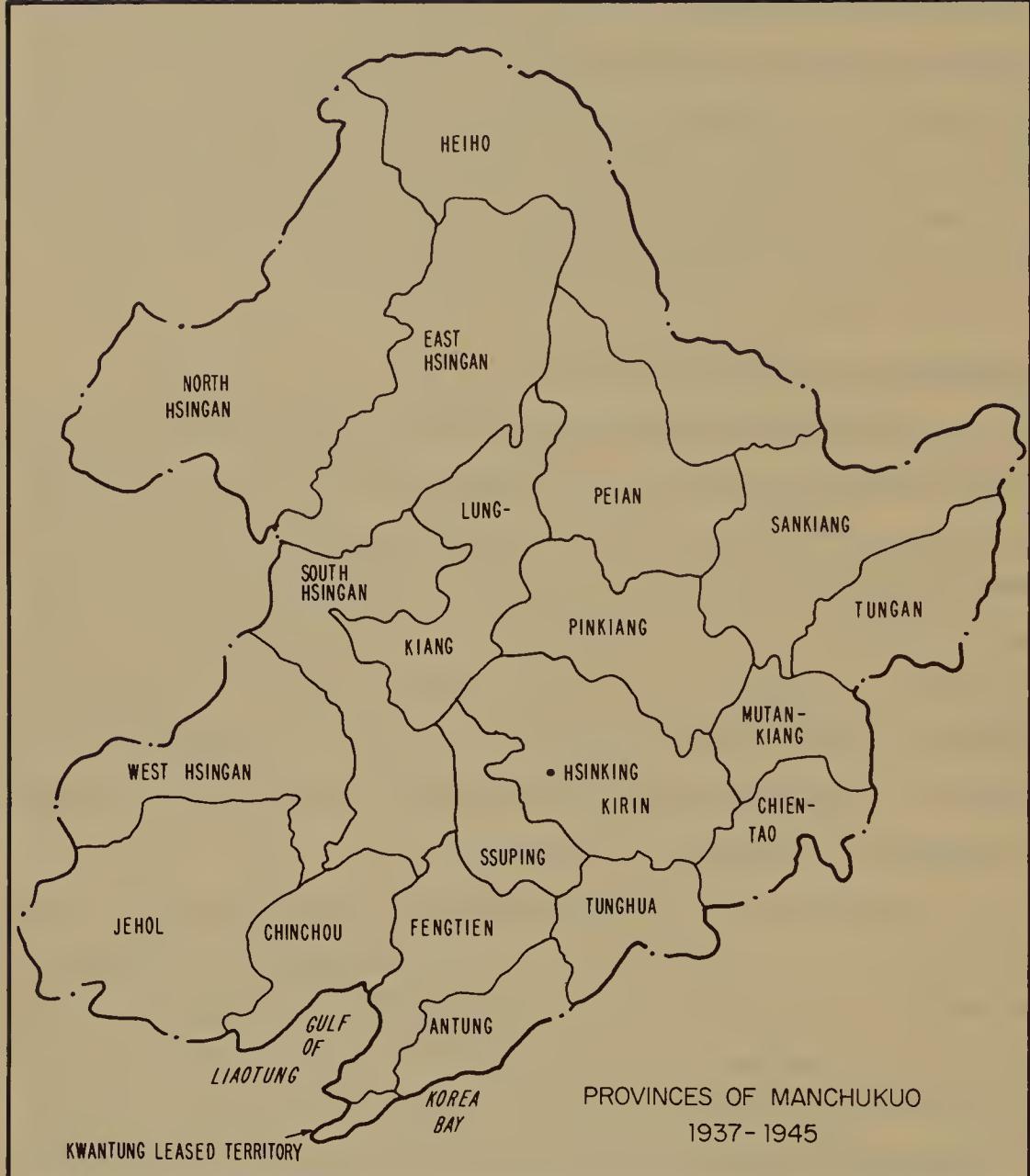
ratios ranged between 5.2 and 5.9.<sup>34</sup> One careful study of the American agricultural sector, done for the National Bureau of Economic Research, has estimated that the capital-output ratio in American agriculture declined slowly from about 7.0 in 1900 to about 4.5 in 1950.<sup>35</sup> This suggests that both the macroeconomic and the microeconomic capital-output ratios for Manchuria lie within a plausible range, which provides a certain amount of further corroboration for the estimates made in Table 9.

### *The Manchukuo Period (1932-1945)*

The political events that led up to the establishment of the puppet state of Manchukuo in 1932 are well known, and will be reviewed only briefly. On September 18, 1931, the officers of the Kwantung Army arranged for a bomb to be exploded along the tracks of the SMR north of Mukden. They then used this incident as a pretext for launching a full-scale attack on the forces of Chang Hsüeh-liang. By early 1932 all of Manchuria had fallen to the Japanese, who then recognized Manchukuo as an independent state, with the last Ch'ing emperor, Pu-yi, as its nominal ruler.<sup>36</sup> The fiction of Manchukuo's sovereignty was maintained until Japan's defeat in 1945.

One consequence of these events was that the names of Manchuria's political subdivisions underwent a somewhat bewildering series of changes. Manchuria's three original provinces (Fengtien, Kirin, and Heilungkiang) were broken up into smaller units by the Japanese. In addition, the Japanese added Jehol and other parts of Inner Mongolia to Manchukuo's territory. Thus by 1937 there were a total of nineteen provinces in Manchukuo, as indicated in Map 2. After 1945 these subdivisions were amalgamated by stages; at the present time there are again three provinces in Manchuria—corresponding approximately to the original three, but called Liaoning, Kirin, and Heilungkiang.<sup>37</sup>

The year 1931 was an economic as well as a political watershed for Manchuria. Because Manchuria was on a silver standard, it was temporarily protected from the decline of world prices for agricultural products that began in 1926 and reached crisis proportions in the Great Depression of 1929,



Source: Waller Wynne, *The Population of Manchuria* (Washington, D.C., 1958), p. 8.

for the price of silver in terms of gold dropped further than general commodity prices, so that deflation was temporarily avoided. But after 1931 the Chinese exchange began to rise, as a result of the devaluation of the British pound sterling, followed by the Indian rupee, the Japanese yen, and the American dollar.<sup>38</sup> A further rise in the price of silver, caused by American government purchases of silver, brought great deflationary pressure on silver-using countries and forced both China and Manchuria to abandon the silver standard. Thus, side by side with the political difficulties of this period, economic depression caused Manchuria's agricultural development to suffer a great setback.

In the agricultural field, Manchuria's new Japanese rulers had three basic objectives, which may be summarized as follows: (1) to make Manchukuo self-sufficient in agricultural production as far as possible, (2) to stop Chinese immigration while encouraging Japanese to come as settlers, not only to solidify Japan's political position in Manchuria but also to modernize the country's agriculture, and (3) to increase output—and government collection—of the agricultural products needed to support Japan's war effort. In the pages that follow, each of these objectives will be discussed in turn. As will be seen below, the Japanese were not very successful in achieving any of the three goals. In part this was a result of external conditions, such as the Depression, but in part it was because the three objectives were not completely in harmony with each other.

### *Self-sufficiency and diversification*

In the early thirties the theory of economic autarky was accepted in many parts of the world and was particularly strongly entertained by the Kwantung officers and their economic consultants. Thus, on March 1, 1933, on the first anniversary of the establishment of Manchukuo, the government announced its basic economic policies, in which the following principle in regard to agricultural production was proclaimed: "The objective for the increase of farm produce lies in planning to be self-sufficient in those products which must be imported from abroad, as well as in striving to export greater quantities of agricultural produce in general."<sup>39</sup> At that time, foods and

textiles together constituted over one-half of all of Manchuria's imports.<sup>40</sup> The chief food imports included wheat flour, rice, sugar, fruits and vegetables, and tobacco. In the textiles group were raw cotton, cotton yarn, cotton, wool, and silk piece goods, clothing, and gunny bags. In addition, there were large imports of paper and of leather and hides, which were also agricultural products. This heavy dependence on agricultural imports is not surprising, when it is remembered that as late as 1935-1942 only about seven per cent of Manchuria's cultivated land was devoted to crops other than cereals and pulses. Nevertheless, Manchuria's agricultural imports were looked upon with great disfavor by the Japanese, who tried hard to increase domestic production of these items.

An attempt to increase cotton production had long engaged the attention of the Kwantung Administration, the SMR, and the Chinese government. American Upland cotton was introduced quite early with some success, and in 1921 cotton mills were set up in Manchuria. In 1933 a ten year plan for increasing the planted area of cotton to 300,000 *cho* and production to 150,000,000 *kin* of ginned cotton was announced.<sup>41</sup> In April 1933 the Manchuria Cotton Association was organized to encourage cotton cultivation, and in April, 1934, the Manchuria Cotton Company was formed with the participation of the cotton mills to ensure the purchase of the cotton crop. Through the cooperation and efforts of these two organizations the extension of the planted area and the substitution of American cotton for native varieties made considerable progress. As shown in Table 10, production of ginned cotton reached approximately 77,000 metric tons in 1941. This still fell somewhat below the target of 150 million *kin* (roughly 90,000 metric tons), but it was the best level attained under the Japanese, for after 1941 production declined. Despite the introduction of American strains, the quality of the cotton was still short of the expectations of the mills and remained inferior to that of the cotton brought in from North China.

Unlike cotton, which was known to be unsuited to Manchuria's climate, wheat was at one time a great hope of the Manchukuo planners. It was mainly grown in north Manchuria and in a small area around Muken.

Table 10

Adjusted Production Statistics of Extra-Ordinary Crops  
In Manchuria, 1935-1944

(in metric tons)

Year	Fruit	Vegetables	Tobacco	Sugar beet
1935	39,079	3,212,780	21,193	26,724
1936	38,976	3,227,822	21,193	26,726
1937	49,498	3,213,151	21,193	26,720
1938	34,742	4,176,988	17,724	152,579
1939	43,189	4,435,100	28,265	331,970
1940	57,112	5,375,903	25,733	261,631
1941	63,512	6,866,972	38,808	259,511
1942	82,705	6,848,732	33,254	198,156
1943	82,705	6,848,732	37,001	260,023
1944	82,705	6,848,732	37,001	266,023
Year	Industrial crops, other	Cotton	Hemp	Blue hemp
1935	2,918	36,637	10,558	18,730
1936	3,169	36,698	10,873	18,730
1937	2,482	36,887	10,773	18,730
1938	1,815	56,260	12,145	11,804
1939	1,373	50,584	13,468	10,793
1940	1,265	75,064	19,459	11,285
1941	1,715	77,470	14,629	7,151
1942	2,131	63,466	17,637	5,433
1943	2,131	61,319	21,922	5,534
1944	2,131	61,319	21,922	2,915
Year	Flax	Kenafe	Castor	Hemp seed
1935	5,801	—	21,195	60,750
1936	5,801	—	21,117	60,750
1937	5,801	—	21,182	60,750
1938	30,872	3,633	17,489	46,155
1939	45,257	7,247	15,227	59,219
1940	50,983	17,368	14,747	82,870
1941	61,343	32,306	13,308	67,108
1942	60,970	16,220	3,016	64,775
1943	68,886	26,317	8,948	71,609
1944	68,886	26,317	3,502	49,501
Year	Peanuts	Perilla	Sesame	Index of value
1935	109,083	208,174	14,559	100.0
1936	112,324	208,174	14,554	98.6
1937	124,448	208,174	14,550	102.1
1938	90,789	128,568	11,110	110.7
1939	95,163	56,364	16,558	110.7
1940	62,134	34,353	19,091	138.1
1941	56,505	36,968	13,077	162.0
1942	39,576	47,506	7,519	158.6
1943	29,665	48,542	7,519	163.4
1944	31,148	28,543	7,519	152.7

Sources: *Manshū nōsan tōkei* (Statistical yearbook of Manchurian agricultural production); *Tung-pei ching-chi hsiao ts'ung-shu* (Small collection of books on the economy of Manchuria; [place and date uncertain: R.W.H.]); *Minami Manshū Tetsudō Kabushiki Kaisha sanjūnen ryakushi* (A brief history of thirty years of the South Manchurian Railway Company; Dairen, 1937).

Note on geographical coverage: As in Table 7, data for Kwantung and the SMR Zone have been added in. Also, where necessary, data for non-Manchurian areas (e.g., Jehol and other portions of Inner Mongolia) have been subtracted.

According to the studies of the experimental station at K'o-shan, the quality of north Manchurian wheat, as measured by its albumen and gluten content, was superior to the products of many wheat-producing countries.<sup>42</sup> Since it was intended that the migration of Japanese farmers into Manchuria would mainly be directed to north Manchuria, the suitability of that region for growing wheat naturally spurred the planners' enthusiasm for that crop. The flour companies were organized into a Flour Millers' Association, which allocated a production quota to each mill. Distribution was also organized by forming wholesalers' and retailers' associations. The three state agricultural experimental stations at K'o-shan, Harbin, and Chia-mu-ssu were asked to conduct experiments and select better seed. To encourage the planting of wheat the government, beginning in October 1934, imposed a duty of 37 *fen* on each bag of imported flour. A twenty-five year plan was drawn up, by the end of which (1961) the production of wheat was expected to reach roughly 2,460,000 metric tons, while by 1941 (the end of the fifth year) production was expected to exceed domestic consumption, as shown in this table:<sup>43</sup>

The First Five Year Plan for Wheat

Year	Planted Area (1,000 hectares)	Production (in 1,000 MT)	Consumption (1,000 MT)	Surplus (1,000 MT)
1937	1,171	1,158	1,585	-427
1938	1,298	1,297	1,624	-327
1939	1,451	1,519	1,663	-147
1940	1,613	1,765	1,703	+ 62
1941	1,776	2,026	1,744	+282

But actual results were very disappointing. As may be seen from Table 12, wheat production declined rather steadily after 1935, with output in 1944 reaching only about 31 per cent of the 1935 level. This decline was due primarily to two causes: (1) during the war the planners were forced to emphasize quantity instead of quality, and therefore gave preference to crops like corn that have a higher yield per hectare, and (2) the weather in these years was not favorable to wheat growing.<sup>44</sup>

Gunny bags were another important import, amounting to almost 10 million Haikwan taels in 1930.<sup>45</sup> They were used to pack and transport many agricultural products, including soybeans and bean cake. In early years the sacks were mostly imported from India. In 1917 a Japanese company was formed in Dairen to make these bags, and later another one was set up in Mukden for the same purpose.<sup>46</sup> The companies tried to use the local blue hemp (*ch'ing-ma*), but the fiber was not very good and its supply was irregular, so jute was imported from India as raw material. In 1933 a new kind of fiber plant, kenafe, was introduced into Manchuria. It came originally from an area near the Caspian Sea. The agricultural experimental station at Kungchuling compared it with native blue hemp and found that kenafe was stronger and that it gave a higher yield per hectare as well.<sup>47</sup> The experimental station went further and analyzed the seeds and leaves of the plant. It found that the seeds contain 19 to 20 per cent oil, about the same as soybean. The oil is semi-dry in nature, similar to cotton seed oil or sesame oil, and is therefore edible. The residue that is left after pressing out the oil contains about 20 per cent protein and is therefore good for feed. As a fertilizer it contains less nitrogen than soybean cake but more than cotton seed cake. The leaves are also rich in protein and suitable for feed.<sup>48</sup> As may be seen from Table 10, the production of kenafe increased very rapidly. The introduction of this plant was one indisputably beneficial result of the Japanese quest for autarky.

As already described in an earlier section, the infant sugar beet industry faced great competition from imported cane sugar, and by 1928 all the sugar beet processing plants had shut down. When the Manchukuo government announced its policy of agricultural self-sufficiency, shrewd Japanese merchants foresaw the possibility of reviving the sugar beet industry and started to purchase the closed down plants. One group purchased the assets of the former Mukden plant together with its equipment at Tiehling and under the name of the Manchuria Sugar Manufacturing Company opened for business in 1936. They also took over the Hulan plant in north Manchuria later. Another merchant bought an interest in the former Ashiho factory and started the

North Manchuria Sugar Manufacturing Company.<sup>49</sup> These companies cooperated with the government in formulating and pushing forward a five-year plan for sugar beets. Government organizations distributed seeds and taught the farmers how to cultivate the crop. The companies often increased their purchase price and shared a part of the costs of seeds and fertilizers; they also assisted the farmers in controlling blight, and subsidized transportation costs. The Kungchuling experimental station, after years of research, finally developed improved varieties of beet suited to the Manchurian climate, with a sugar content of 18 or 19 per cent. The five-year plan seems to have met with success. As shown in Table 10, production rose to 266,000 metric tons in 1943, which was not much short of the target of 300,000 metric tons. It is worth noting that the cultivation of sugar beets contributed more to the economy than just a subsidized supply of sugar. As a rotating crop, the beets had a beneficial effect on the soil, and the stems, leaves, and pulp made good livestock feed, which also helped return fertility to the soil. Thus, despite the difficulties of the late 1920's, the successful introduction of sugar beet cultivation must be considered another blessing of the Japanese policy of self-sufficiency.

Tobacco was another crop that received special mention in the Manchukuo government's plans.<sup>50</sup> Its output fluctuated but showed a definite upward trend (see Table 10), for during the war cigarette consumption increased but no importing of tobacco leaves was possible.

Livestock also played an important part in Japanese plans. The earlier successes of the Kungchuling experimental station at developing improved breeds of pigs, poultry, and cattle have already been described. In the Manchukuo period, however, primary emphasis was placed on horses and sheep, because these were the animals in which the army took the greatest interest. Horse races were held in a number of places to arouse the enthusiasm of the people and to raise funds. Fourteen breeding farms were established in different parts of the country, and animal disease clinics were set up in several centers. In 1936 it was planned that at the end of ten years the number of horses in Manchuria should be raised to 2,500,000, of which a half should be improved

breeds. But at the end of World War II the number of horses of the improved type amounted to only 95,000.<sup>51</sup> The plan was too ambitious, but if at the end of the war there were 95,000 of the better horses, it must be considered a partial success.

The wool industry received much attention during the Manchukuo period. As mentioned earlier, the development of an improved breed of sheep was successfully carried out at Kungchuling in the 1920's. Against this background, a thirty-year plan was drawn up, at the end of which (1967) the number of sheep in Manchuria was expected to reach 15 million head, all of the improved variety. The target for the end of the fifth year (1941) was 4,202,000 head, of which about nine per cent were to be either thoroughbred Merino or cross-bred. In fact, the herds in 1941 totalled about 3,770,000 head, and no data were given to indicate what percentage of these were still the unimproved native breed.<sup>52</sup> The Japanese explained that the plan could not be realized because the war in the Pacific interrupted the supply of thoroughbred Merino rams from Australia, but there is reason to think that the plan would not have been feasible even under more favorable circumstances. In 1935 an Australian expert, Clunies Ross, went to Manchuria to study the situation there. In his report, he wrote:<sup>53</sup>

The low and highly seasonal distribution of rainfall, the intensely cold winter, and the sparse, semi-desert nature of the pastures lead inevitably to conditions which do not predispose to heavy carrying capacity even of native sheep. It is probable that existing nomadic practices of the Mongolian population have led to the maximum safe utilization of this country for pastoral purposes.... It is admitted that some increase might be effected where, as in the border territories, the farm wastes are used for sheep fodder during the winter months, as for example, soybean straw. Even under the most primitive conditions, however, the economics of hand feeding in relation to the return from the sheep would require serious consideration.

It has not yet been established that even first cross Merino Mongolian sheep will withstand winter in Western and particularly Northwestern Manchukuo, without housing for a large part of the winter and a considerable degree of supplementary feeding. Even if this should be possible, it has to be remembered also that the fleeces of these sheep, both in quantity and quality, still possess many of the undesirable characteristics of the native sheep from the manufacturing standpoint. In the case of the second cross and inbred second cross sheep, the general consensus of opinion, with which the experience of the writer concurs, is that they are incapable of surviving under natural grazing conditions and require intensive handfeeding and housing for at least five to six months of the year....

This does not preclude the possibility of a limited production of improved wool being achieved, even though it be on a quite uneconomic basis.

Ross's opinions were frank and objective, and make it appear that the thirty-year plan drawn up by the Japanese had no chance of success, whatever the political circumstances.

The last aspect of Manchukuo's attempt to become self-sufficient that I will discuss is the policy that was adopted toward forest resources. Of course, wood is used for many things besides the making of paper, and therefore more than a simple desire for autarky lay behind Japanese interest in Manchuria's timber reserves. During the previous two centuries, with the inflow of population, the construction of the railroads, and the granting of timber-cutting rights along the Yalu River to foreign firms, there was much reckless destruction and felling of trees. Fortunately, a large portion of the forests was inaccessible and therefore remained intact. When Manchukuo was set up, the Japanese took steps to conserve the forests and to put lumbering operations on a rational basis. In 1933 it was officially proclaimed that "this country will endeavor to restrict and control the indiscreet felling of trees, and to protect and increase the production of trees, as well as to preserve the productive capacity of the forests through rational management."<sup>54</sup> In accordance with

this declared policy, an aerial survey of the forests was soon begun. In 1936 working parties were sent to the principal forest areas to make surveys, using the aerial map for reference. This work lasted until 1941, when a master plan was drawn up, the details of which are summarized in Table 11. According to

Table 11

Manchukuo's Forest Resources in 1941

Area	51,926,600 hectares
 Volume of standing timber:	
Conifers	2,172,662,650 cubic meters
Broadleaved	1,510,422,700      "
Total	3,683,085,350      "
 Allowable cut per year:	
Conifers	11,056,048 cubic meters
Broadleaved	8,712,627      "
Total	19,768,675      "
 Annual additions:	
Nursling trees	494,822 cubic meters
New plantings	223,144      "
Total	717,966      "

*Source: Tung-pei ching-chi hsiao ts'ung-shu* (Small collection of books on the economy of Manchuria; [place and date uncertain: R.W.H.]).

the figures in Table 11, the total allowable cut per year amounted to roughly 20 million cubic meters in an area of 52 million hectares, or about 0.4 cubic meters per hectare—quite a low figure by accepted world standards.<sup>55</sup> Furthermore, although the cutting of timber in Manchuria increased very fast during the war, the actual amount cut fell far below planned amounts, due to transportation difficulties and other problems. And even the planned amounts were much smaller than the figure for allowable cut given in Table 11. It may be that natural timber losses are higher in Manchuria than in other parts of the world. Nevertheless, it seems clear that at the end of World War II Manchuria's forests were still being underutilized.

In sum, the Japanese quest for economic self-sufficiency led to a variety of projects, some of which were successful and some of which ended in failure. But they certainly broke the inertia of tradition and introduced new ideas into the field of agriculture. One rough indicator of the success of many of these measures is the fact that the contribution of "extra-ordinary" crops to the value of Manchuria's total agricultural output, which amounted to about 12 per cent in 1935, rose steadily to almost 19 per cent in 1942, before falling off slightly in 1943 and 1944.<sup>56</sup>

#### *Japanese migration*

In the period before 1931 the Kwantung Administration and the SMR had both tried to attract Japanese immigrants to Manchuria, but the results were not very impressive. At the end of 1931 there were 64,662 agricultural households in the Kwantung peninsula and the SMR zone, of which only 308 were Japanese.<sup>57</sup> Japan had always hoped that one day her citizens could own and operate land in all parts of Manchuria—a hope that found expression, for example, in the well-known "Twenty-One Demands" of 1915. Although Peking finally agreed to let Japanese nationals lease land outside Kwantung and the SMR zone, the local Chinese authorities viewed this as a concession made under duress and persistently frustrated its implementation. This was admittedly a contributing cause to the Manchurian Incident in 1931. At the same time the large inflow of Chinese laborers into Manchuria after 1926 caused alarm and envy among the Japanese. Therefore, when the Japanese gained control of the entire country in 1932, they quickly restricted Chinese immigration and encouraged large-scale Japanese colonization.

In 1933 an organization was set up in Tientsin to screen all Chinese who wished to enter Manchuria, and in 1935 further restrictions on "foreign laborers" (i.e., Chinese) were promulgated by the Manchukuo government. After 1937, when the Five Year Industrial Development Plan was put into effect, these controls were relaxed somewhat, but almost all the Chinese then permitted to enter were channeled into industry, not agriculture.<sup>58</sup> At the

same time, Japanese immigration received great attention. In late 1932 the first group of so-called "armed immigrants" was sent from Tokyo to Chia-mu-ssu. They met considerable resistance from the local people, but with the army's help they kept their ground. In the next two years three more groups of this type were sent. By 1935 the Kwantung Army had effectively eliminated the local resistance forces, and therefore proposed a more ambitious migration plan. The new premier of Japan, Hirota Kōki, accepted the plan, and it was adopted by the Japanese cabinet in August, 1936.<sup>59</sup> In essence, the plan called for the movement of one million farm households (about five million people) over a period of twenty years, with 100,000 households to be moved in the first five years. Geographically, it was intended that about 90 per cent of the settlers would be sent to Central and North Manchuria.

It was generally estimated that each household would require about twenty hectares of land, and therefore a total of about 20 million hectares of idle land was needed. At first it was thought that acquiring the necessary land would be relatively easy, but it turned out to be a headache. In 1936 the Manchuria Colonization Company (*Manshū takushoku kaisha*) and the Korea-Manchuria Colonization Company (*Sen-Man takushoku kaisha*) were organized to help Japanese and Korean immigrants, respectively, obtain land. By 1939, however, the Manchukuo government decided that it would have to take direct control of the land acquisition process. The Division on Colonial Affairs of the Ministry of Industries was greatly enlarged and re-named the Central Bureau for Colonization and Settlement Affairs (*Kaitaku sokyoku*). Also, a subsidiary organization, called the Manchuria Land Development Company (*Manshū tochi kaihatsu kaisha*), was set up to carry out the actual field work (surveying, engineering, etc.) that had to be done before the settlers arrived. As a first target, this company was asked to prepare six million hectares for settlement. The importance attached to this effort is indicated by the fact that in 1943 the agencies working on immigration received 173 million yuan, or 8 per cent, of the Manchukuo government's total budget. In the same year, the Japanese government allocated an additional 66 million yen to this work.<sup>60</sup>

It will be remembered that the 1940 data on the pattern of land use, cited above in Table 5, classified swamps and alkaline land as uncultivable. However, when a careful field survey was carried out by a group of scientists in 1943, it was discovered that both kinds of land could be prepared for cultivation with much less effort than had previously been supposed.<sup>61</sup> Therefore in that same year it was decided that for the next three years the land development work should be concentrated in two areas: approximately 5.2 million hectares of alkaline soil in Pinkiang and Lungkiang provinces, and about 3 million hectares of swamp in the provinces of Sankiang and Tungan.<sup>62</sup> This project was hardly begun, however, when the Japanese government decided that Manchukuo should give emergency priority to rice production, to ensure Japan's rice supply in the face of American interdiction of the shipping routes to Southeast Asia. The Manchuria Land Development Company revised its plans accordingly, and attempted to find and develop land suited to rice growing. But, when the ships carrying indispensable pumps and other equipment were sunk en route from Kobe, the work could be carried no further.

Another difficulty, also a result of the war, was that it became increasingly difficult to find able-bodied men to settle the new lands, for most of them were serving in the army or working in war industries. The original intention was to re-settle 100,000 households by the end of the first five years of the twenty year plan (that is, by 1941), but by 1942 only 57,401 families had actually migrated to Manchuria.<sup>63</sup>

In an earlier section, it was suggested that in 1931 Manchuria enjoyed a considerable margin of idle land. The restrictions on Chinese immigration during the Manchukuo period, coupled with the discovery that many alkaline and swampy areas were cultivable, suggest that there was still a good deal of idle land in 1945. It is not easy, however, to estimate the amount of such land with any precision. One estimate was suggested by Takebe Rokuzō, the highest Japanese official in the Manchukuo government, at a news conference in 1944. At that time he indicated that the government felt that the cultivable land that remained unexploited amounted to about 13 million hectares.<sup>64</sup>

Takebe was a careful and conservative person, so his opinion deserves serious consideration. Of course, after the Japanese settlers were repatriated, their land became available and should therefore be added to Takebe's figure. But, because the colonization program had not been very successful, not too much land was freed in this way—perhaps 400,000 hectares in all.<sup>65</sup>

One other possibility should also be mentioned: there may have been some cultivable areas that were not included in Takebe's estimate. It will be recalled that in 1939 the Manchuria Land Development Company was asked to prepare six million hectares for farming. This six million hectares was the arable portion of a region that covered 15 million hectares, and this larger region was in turn part of an area of 26 million hectares that had once been classified as cultivable. Thus about 40 per cent of the 15 million hectare region turned out to be useable. Applying the same percentage to the other eleven million hectares suggests that there were an additional 4.4 million hectares of useable land available. To be conservative, I would use a figure of 30 per cent, which yields an estimate of 3.3 million hectares. Adding this to Takabe's estimate plus the 400,000 hectares of evacuated land then gives a total of about 16.7 million hectares of idle but arable land in 1945. Such an estimate is necessarily only a rough approximation, but it does indicate clearly that Manchuria's agricultural sector still had significant room for growth on the extensive margin at the end of the Manchukuo period.

From the point of view of Manchuria's agricultural development, the important aspect of Japan's colonization plans was not the quantity of people involved but the quality, for the new settlers were strongly encouraged to use modern farming methods—especially those that had been developed on the Japanese island of Hokkaido.

The Hokkaido story is a long one and can only be summarized here. The island remained largely undeveloped until the Meiji Restoration in 1868, when fear of Russian expansion led to a new interest in the region. Kuroda Kiyotaka, an eminent leader of the period, was sent to the United States to study agriculture and to hire expert advisers. He was attracted by the personality

✓ of Horace Capron, then the U.S. Commissioner of Agriculture under President Grant, and soon persuaded Capron to come to Hokkaido. It is now generally recognized by the Japanese that Capron laid the foundation for the agricultural development of Hokkaido. He introduced American farm implements and machines, stressed the importance of livestock, made basic surveys of local resources, collected many species of plants, fruits and animals from different parts of the world and tested their adaptability in Hokkaido, and hired foreign experts to teach modern techniques to the local people. Japan's limited financial resources prevented the immediate development of Capron's work, but beginning in 1909 increased amounts were appropriated for agricultural research and development. Livestock raising, which was neglected after Capron returned to the United States in 1875, was re-emphasized. In the 1920's, four farm families from Germany and Denmark were invited to come to Hokkaido for five years to teach their methods to the natives. In 1927, on the basis of Capron's ideas and the lessons taught by these Europeans, a 25-year plan for agricultural development in Hokkaido was launched. This plan helped the farmers of Hokkaido to pull through the Depression and several severe winters without too much difficulty.

✓ Since Japan's intention in Manchuria was to locate most of the new immigrants in the northern part of the country, where both climate and farm size were rather similar to Hokkaido's, it occurred to the Japanese planners that the methods that had succeeded so well in the one place should also be tried in the other. Farmers from Hokkaido were brought to Manchuria to demonstrate their methods; at the same time apprentices were sent to Hokkaido to study. By 1943 it was reported that 72 per cent of the land farmed by Japanese settlers in Manchuria was being cultivated according to the new techniques.<sup>66</sup> In essence, this meant that modern machines and implements were in use, and that livestock and sugar beets were receiving due attention. When the Japanese farmers were repatriated at the end of the war, something of their new methods must have remained behind.

### *Increasing current output*

The Japanese hoped that their attempt to diversify Manchuria's agricultural output in the name of self-sufficiency would not interfere with the production of the traditional cereals and pulses that were classified as "ordinary crops." The official Manchukuo data indicate that this hope was realized, but these official figures are very misleading, for their geographical coverage expanded over time. When the data are properly adjusted, (by subtracting the output of Jehol and other parts of Mongolia from the figures for later years), it becomes clear that the production of ordinary crops in the Manchukuo period never regained the levels reached in the late 1920's. Details are given in Table 12, which is a continuation of Table 7.

When analyzing the reasons for this failure, it is useful to distinguish three time periods within the Manchukuo era. The first period (from about 1932 to 1935) was one both of open warfare within Manchuria and of worldwide economic depression, and it is hardly surprising that agricultural output fell off. The third period (from about 1942 to 1945) was also one in which agriculture suffered from the effects of war. Manpower was scarce, and access to foreign supplies and foreign markets was cut off. For example, soybean exports declined precipitously as early as 1940 and 1941 (see Table 13.) Another problem of this third period was that the government tried desperately to increase its collections of grains and other crops at artificially low prices, while at the same time the farmers' cost of living was skyrocketing.<sup>67</sup> The effect on farmers' incentives can easily be imagined. Takasaki Tatsunosuke, who remained in Manchuria for some time after the Japanese surrender, described the situation in these words:<sup>68</sup>

Taking the planned figures for 1945 as 100, the collection in that year of kaoliang, millet, and corn amounted to 136, that of barley and oats to 116, that of soybeans to 85, and that of oil seeds to 67. These results were achieved by bringing great pressure on the farmers, with the backing of the soldiers' bayonets. Of all products, the collection of the soybean was the most exacting and strict; failure to deliver was often sufficient

Table 12  
 Adjusted Production Statistics of Ordinary Crops  
 In Manchuria, 1932-1944

(in metric tons)

Year	Soybeans	Other beans	Kaoliang	Millet
1932	4,283,752	288,264	3,758,593	2,636,332
1933	4,619,800	316,109	4,052,167	3,208,389
1934	3,416,959	287,389	3,498,587	2,144,138
1935	3,838,897	325,147	4,006,589	2,968,092
1936	4,125,428	337,742	4,147,792	3,188,065
1937	4,589,926	360,918	4,585,396	3,134,227
1938	4,582,519	347,412	4,473,664	1,976,908
1939	3,791,305	288,197	4,266,914	2,906,318
1940	3,275,271	361,673	4,275,252	2,978,669
1941	3,220,580	350,929	4,132,036	2,757,762
1942	2,883,730	277,892	3,993,647	2,477,263
1943	3,116,547	202,225	4,611,744	2,457,874
1944	3,334,165	129,981	4,780,414	3,100,465
Year	Corn	Wheat	Paddy rice	Upland rice
1932	1,667,087	1,134,652	110,892	137,660
1933	1,881,320	864,794	167,726	143,524
1934	1,622,308	644,683	202,023	126,270
1935	2,002,373	1,023,958	297,807	147,543
1936	2,180,614	957,567	444,396	155,689
1937	2,499,818	974,904	599,975	140,609
1938	2,478,782	976,165	619,536	131,087
1939	2,376,403	888,970	743,846	102,556
1940	2,789,422	748,813	601,185	99,068
1941	3,083,074	823,823	713,361	83,970
1942	3,134,409	675,158	324,558	49,790
1943	3,884,637	373,762	643,710	41,665
1944	4,022,152	319,809	690,305	35,552
Year	Other cereals	Total	Index of quantity	Index of value
1932	1,559,632	15,576,864	106.7	109.9
1933	1,812,210	17,066,037	116.9	118.7
1934	1,053,991	12,996,348	89.1	90.8
1935	1,101,787	15,712,193	107.6	109.8
1936	1,088,281	16,625,578	113.9	116.2
1937	1,165,353	18,051,126	123.7	126.9
1938	1,079,315	16,665,288	114.2	119.5
1939	979,751	16,344,260	112.0	114.9
1940	1,075,460	16,204,813	111.0	111.8
1941	1,061,793	16,227,328	111.2	112.6
1942	1,234,047	15,250,494	104.5	104.1
1943	1,056,996	16,389,160	112.3	111.3
1944	799,485	17,212,328	115.7	116.1

Sources: For the Kwantung Leased Territory and the SMR Zone: *Minami Manshū Tetsudō Kabushiki Kaisha sanjūnen ryakushi* (A brief history of thirty years of the South Manchurian Railway Company; Dairen, 1937). For the rest of Manchuria: *Manshū nōsan tōkei* (Statistical yearbook of Manchurian agricultural production) for the various years.

cause for a farmer to be sent to prison. However, due to shipping difficulties, the beans collected could not be sent to Japan. They were piled up along the railway track and exposed to the elements within sight of the farmers who had grown them. Their indignation can be easily imagined. It was reported that when the Chinese Communists took control and public trials were instituted, the people often pointed out the crop collectors as evil persons to be condemned, and many were done away with.

During the middle period, from about 1936 to 1941, conditions were much more peaceful, but the output of ordinary crops was still rather disappointing. In general, the Japanese economists in Manchuria blamed the land tenancy system, and this was certainly a part of the problem. In the early

Table 13

Exports of Soybeans and Bean Products,  
1932 - 1941

(in 1,000 metric tons)

Year	Beans	Bean cake	Bean oil	Total	Index number (1917 = 100)
1932	2,573	1,422	126	4,121	228.1
1933	2,365	1,076	79	3,520	194.8
1934	2,498	1,233	95	3,826	211.7
1935	1,766	1,024	89	2,879	159.3
1936	1,986	848	67	2,901	160.5
1937	1,974	808	70	2,852	157.8
1938	2,165	869	57	3,091	171.1
1939	1,712	1,220	73	3,005	166.3
1940	603	495	18	1,116	61.8
1941	683	447	17	1,147	63.5

Sources: This table is a continuation of Table 6 (p. 45) and is based on the same sources.

part of the century, when prices were good and farm incomes were rising, many tenants managed to become landowners. By the late 1920's, however, as large numbers of immigrants poured in and as profit-seekers began to speculate in land, the price of land and the burden of rents were gradually driven up. Land tenure was short and insecure (typically it was granted for only one year at a time). With absentee landlords after quick profits and with tenants so hard-pressed and insecure, the natural result was exploitative farming that drained the land of its fertility. The economists understood this and called for land reform, but the Kwantung Army did not want to alienate Manchukuo's propertied classes—and certainly did not want to establish a precedent that might have repercussions in Japan itself—and therefore no meaningful reforms were undertaken.<sup>69</sup>

## Chapter III

### THE INDUSTRIAL DEVELOPMENT OF MANCHURIA

#### *The Period Before 1931*

In the traditional Manchurian economy there were three main industries, all of which used agricultural products as their raw materials. In each, a surplus agricultural product was transformed into a more concentrated form; usually it was then shipped abroad, to be exchanged for goods not easily produced in Manchuria. The first of these industries extracted the oil from soybeans. Originally the residue was used in Manchuria as feed, but later it was also exported to be used as fertilizers. The second traditional industry ground wheat into flour, while the third distilled a famous and very potent liquor from kaoliang. Other industries to meet local needs also developed on a smaller scale. To quote a foreign traveller who visited Manchuria near the close of the nineteenth century:<sup>1</sup>

Manufacturing in Manchuria is not advanced.... There is but little weaving, and the cotton cloths which are in universal wear are imported from China, but dyeing establishments were numerous. Capital furniture, boxes, and coffins are made, elegantly painted and lacquered, as well as a kind of parquetry, and the carpenters are unrivaled in the manufacture of carts and cartwheels. Tanning and the preparation of furs reached a very high pitch of excellence, and the leather for shoes is good. There is a little carving of marbles.

According to some Japanese scholars, spinning and weaving, porcelain making, and the smelting of iron seem to have developed for a time during the reigns of the Ch'ing emperors Hsien-feng and T'ung-chih but later declined in the face of import competition.<sup>2</sup> It is quite possible that during the Taiping Rebellion, when supplies from the Yangtse valley became unavailable, local production flourished temporarily but withered away when imports from China and other countries again appeared.

The first modern industrial machinery introduced into Manchuria was perhaps the steam-powered oil mills brought from Shanghai and Hongkong to Newchang, but the large-scale introduction of western industrial arts was first made by the Russians in the north. After they obtained the right to build a railway across Manchuria, they lost no time in pushing forward with the construction. Later, in 1900, they took advantage of the Boxer Uprising and sent troops to occupy many strategic cities. The large influx of troops, engineers, and civilians necessitated the provision of accommodations in western form. Flour mills, alcohol distilleries, and brick kilns began to appear. During the Russo-Japanese war of 1904-1905, Harbin became the headquarters of the Russian troops, and various light industries were stimulated to sudden development. Many of these factories suffered heavy losses as a result of the Russian defeat in 1905, but the situation was soon stabilized and new plants, such as the beet sugar refineries described in Chapter II, were opened.

During World War I industries in north Manchuria developed phenomenally, in particular the oil milling and flour milling firms, which were stimulated by the food shortages caused by the war. But these developments involved few new industries or techniques, and many of the mill owners were Chinese. Then came the collapse of the Russian ruble, the Bolshevik Revolution, intervention by the Allies in Siberia, and the postwar depression. In 1923 half of the flour mills in Harbin were said to be bankrupt, while the oil mills had been obliged to suspend production in 1921. The oil mills managed to make a gradual revival, but only because the Chinese Eastern Railway drastically reduced its freight charges between Harbin and Vladivostok, thereby making northern exports through Vladivostok competitive with southern exports shipped via Dairen.<sup>3</sup> With the gradual restoration of world prosperity, the economy of North Manchuria advanced slowly in the 1920's.

In this gloomy picture, developments in the coal industry were somewhat more promising. The CER had opened a mine at Chalainor as early as 1902, but it produced only lignite, so the industries in Harbin had to use coal from the Japanese-controlled mine at Fushun. The CER itself used timber

as fuel in the early days, but accessible supplies were soon exhausted. Then in 1924 a Russian firm and the provincial government of Kirin entered into an agreement to develop a mine at Mu-leng. The CER extended a branch line to the mine, and coal began to be shipped out in 1925. In the same year, a group of Chinese capitalists reorganized and developed the mine at Hao-kang. Again the CER built a branch line to the mine, and coal shipments began in 1927. The combined production of these two mines soon exceeded that at Chalainor.<sup>4</sup>

While north Manchuria was making a rather sluggish revival, industrial development in south Manchuria showed rapid progress. Japan had fought two wars before she could get a foothold in Manchuria and did not intend to waste her opportunity. Insofar as possible, Manchuria was to be kept as a market for Japanese manufacturers, Manchurian raw material exports were to be handled by Japanese merchants and shippers, and Manchurian natural resources were to be developed for Japan's benefit. The South Manchurian Railway was chosen as one of the major instruments by which these policies were to be carried out. The company was formed by an imperial ordinance of June 7, 1906, "for the purpose of engaging in railway traffic in Manchuria," but subsequently broad powers were conferred on the SMR to engage in subsidiary enterprises, including mining, water transportation, electrical enterprises, sale on commission of the principal goods carried by the railway, warehousing, real estate transactions within the railway zone, and, in addition, "any business for which government permission has been given." The original capital of the company was fixed at 200,000,000, distributed in one million shares. The Japanese government contributed its newly-won railway and mining properties in Manchuria in exchange for one-half of the shares; the other shares were sold to private investors. The management of the company was entrusted to various officers, among whom the president and the vice president were the most important. They were to be appointed by the Japanese government, subject to imperial approval. Control of the railway was further assured by the provision that the government could assume complete control at its own discretion, and that the Japanese Diet had to approve any special expenditures or guarantees

relating to the railway. Thus, the SMR was an instrument of Japanese national policy from the very beginning.<sup>5</sup>

In carrying out its mission, the SMR proceeded along the following lines:

Before 1907 Manchuria's foreign trade was centered at Newchwang, then the only treaty port. As indicated in Chapter II, the chief imports were textiles, particularly cotton cloth from the United States and Great Britain, and the chief exports were the soybean and its products. To increase the company's hold on both the import and export trade and the general commercial traffic of Manchuria, the first step was to improve the equipment and efficiency of the railway and of the underdeveloped port at Dairen, so that trade could be diverted from Newchwang. In accordance with a document attached to the Treaty of Peking of December 1905, Japan obtained China's consent to the opening of sixteen cities and towns to international residence and trade.<sup>6</sup> On the basis of this agreement, Japan soon opened a network of consular offices and chambers of commerce to supply her businessmen with information and guidance. After war broke out in Europe in 1914, British imports almost ceased, while American businessmen were busily engaged in places other than Manchuria. So, within a short time, the Japanese came to dominate Manchuria's trade. Not surprisingly, Dairen soon outstripped Newchwang as Manchuria's most important port. Dairen handled a greater volume of trade than Newchwang for the first time in 1912, and by 1926 the new port was doing four times as much business as the old.<sup>7</sup>

In the meantime the SMR was also busy developing the Fushun coal mine, which was transferred to the Japanese in pursuance with the Treaty of Portsmouth. Under the Russians the mine had produced only about 300 tons per day. The Japanese soon increased its daily output to several thousand tons, as may be seen from the sales statistics given in Table 14. Fushun was one of the richest coal mines in Manchuria and after 1915, when the open-cut method was introduced, its costs were lowered even farther. Besides meeting the requirements of the SMR and its subsidiaries, the coal was sold to the Chinese

Table 14

## Sales of Fushun Coal

(in long tons)

Year	Consumed in Manchuria	Exported	Total (including bunker coal)
1907	198,834	—	202,320
1908	405,693	20,635	443,013
1909	517,300	162,953	714,049
1910	671,761	324,440	1,048,084
1911	866,403	244,715	1,175,462
1912	942,014	568,638	1,641,902
1913	1,085,010	1,231,485	2,502,397
1914	1,243,286	1,005,015	2,475,398
1915	1,347,317	742,668	2,286,537
1916	1,457,541	939,631	2,579,752
1917	1,733,762	811,237	2,718,270
1918	2,240,042	803,923	3,276,535
1919	2,752,955	770,709	3,707,304
1920	2,207,540	746,953	3,194,730
1921	2,190,976	985,479	3,612,714
1922	2,230,983	1,578,671	4,555,010
1923	2,725,508	1,940,012	5,346,774
1924	2,894,195	2,414,338	5,901,974
1925	2,729,481	2,738,649	6,098,292
1926	3,044,559	3,198,149	6,865,984
1927	3,325,840	3,400,659	7,429,624
1928	3,540,667	3,633,992	7,885,866
1929	3,492,226	3,794,209	7,991,786
1930	3,067,964	3,646,323	7,262,881
1931	2,737,999	3,731,221	7,130,683

Source: *Minami Manshū Tetsudō Kabushiki Kaisha sanjūnen ryakushi* (A brief history of thirty years of the South Manchurian Railway Company; Dairen, 1937), pp. 453-454.

Eastern Railway and was exported to Japan. The Fushun enterprise not only supplied the railroad with freight, it also earned handsome profits in its own right. For example, from 1927 to 1931 the mining operations of the SMR, of which Fushun was the most important by far, earned average annual profits of ten million yen.<sup>8</sup>

With Manchuria's trade center shifted to Dairen, soybean exports prospering (see Chapter II), and coal production and sales constantly on the increase, the revenue of the South Manchurian Railway naturally expanded. By charging comparatively high rates and by efficient management the railway became one of the most profitable in the world. Table 15 summarizes the line's financial situation from 1907 to 1931. Because the SMR enjoyed such robust financial health, it was in a good position to explore and develop the industrial potentialities of Manchuria, but in fact the company took a conservative attitude and proceeded cautiously in its early years. Not until Yamamoto Jōtarō, an experienced businessman, became president of the SMR were bold steps taken by the company to start industrial enterprises of its own.<sup>9</sup> In the field of manufacturing the SMR's practice was to ask its Central Laboratory to pose problems and then carry out preliminary experiments. If these succeeded, larger scale operations were attempted. If the results were again satisfactory, this part of the laboratory was made an independent enterprise, either standing alone or operated jointly with an establishment company to ensure technical and financial soundness. A brief description of what the Central Laboratory did for the ceramic industry may serve to show the pattern.

When Japan first took over the Kwantung peninsula, much construction work had to be done and the demand for ceramic products was great. Ordinary bricks and tiles were easily supplied by established Japanese firms that started branch units in Kwantung, but many other enterprises had to be built up locally. One of the first experiments performed by the Central Laboratory was to make firebricks, which were needed by the SMR itself and by some of its factories, such as gas works. In this project the laboratory made use of the fireclay that was in abundant supply in Kwantung. After further

Table 15

Revenues and Expenditures of the  
South Manchurian Railway

(in yen)

Year	Revenues	Expenditures	Net Surplus
1907	9,768,887	6,101,615	3,667,272
1908	12,537,142	5,161,408	7,375,735
1909	15,016,198	5,818,333	9,197,865
1910	15,671,605	6,542,640	9,128,965
1911	17,526,288	6,908,354	10,617,934
1912	19,907,456	7,846,923	12,060,533
1913	22,275,132	7,913,948	14,361,184
1914	23,216,722	8,345,286	14,871,435
1915	23,532,118	8,174,520	15,357,597
1916	27,815,349	8,435,939	19,379,409
1917	34,457,923	10,858,734	23,599,189
1918	44,992,872	17,038,157	27,954,715
1919	67,060,720	30,528,938	36,531,782
1920	85,316,806	36,760,264	48,556,542
1921	78,204,132	33,172,718	45,031,416
1922	87,813,029	34,169,285	53,643,744
1923	92,269,704	35,787,589	56,482,115
1924	92,561,732	36,553,297	56,008,435
1925	97,395,288	38,800,691	58,594,537
1926	107,923,567	45,951,623	61,971,944
1927	113,244,180	45,235,835	68,008,345
1928	118,639,090	44,358,065	74,281,024
1929	122,103,743	47,213,508	74,890,235
1930	95,330,730	36,768,576	58,562,154
1931	84,573,356	36,774,792	47,798,564

Source: *The Manchoukuo Yearbook* (1934), p. 578.

experiments, a sub-unit of the laboratory was made an independent enterprise, named the Dairen Ceramics Co., Ltd. (Dairen Yōgyō K.K.), and produced firebricks, insulators, and similar items. Japan herself was, of course, an exporter of porcelain, but the common people of Manchuria used coarse chinaware which was uneconomical for Japan to supply. When the Central Laboratory succeeded in producing such goods from local materials, another sub-unit was made into an independent business, under the Chinese name of the Greater China Ceramics Company (*Ta-Hua yao-yeh kung-ssu*). Other Japanese and Chinese firms were also started in this industry, but the SMR's Central Laboratory was the first to enter the field.<sup>10</sup>

The Central Laboratory also played an important role in the development of Manchuria's glass industry. After the Russo-Japanese War, many small Chinese and Japanese firms started to make glassware in Manchuria, using waste glass as their raw material. Seeing that Manchuria had silica stone and sand, limestone, and other necessary materials, the Central Laboratory tried to make glass from these local materials. Success was attained in 1919, when it was found that the laboratory's crystal was not inferior to the Austrian and German products. Further technical advance was made by obtaining the services of an Austrian expert, who worked for the laboratory from 1922 to 1928. Before World War I German hard glass had been used for the inner chimneys of miners' safety lamps, for the gauge tubes on steam boilers, and for surgical, chemical, and scientific instruments. Now these could all be replaced by hard glass made in the laboratory. In 1928 this section of the laboratory was separated from the company and combined with the glass unit of the Dairen Ceramics Co., Ltd., which by then was also engaged in glass making, to form a new company, named the South Manchuria Glass Co., Ltd. (Minami Manshū Garasu K.K.). The Central Laboratory also spurred the development of a local plate glass industry. When it had successfully developed the necessary methods and materials, it joined with a major Japanese glass producer to form the Shōkō Glass Co., Ltd. (Shōkō Garasu K.K.), which eventually became the largest glass maker in Manchuria.<sup>11</sup>

The SMR's Central Laboratory also devoted much of its research to the vegetable oil industry, since this was the largest native industry. It succeeded in solidifying soybean oil to be used as a substitute for butter or instead of tallow in the candle and soap industry. After this success, the Dairen Oil and Fat Co., Ltd. (Dairen Yushi K.K.) was formed in 1916; its products were mostly exported to Japan. The laboratory also succeeded in extracting the oil from soybeans by using benzine and alcohol, rather than the traditional presses. On the basis of this method a new company was formed in the period after 1931, but it apparently was not a success.<sup>12</sup>

The Central Laboratory also made important contributions to Manchuria's heavy industry. One obvious example was its role in the development of the shale oil industry. The existence of oil-rich shale over the Fushun coal seam had been known for some time, but its economic significance did not draw the attention of the laboratory until 1915, when the colliery decided to use the open-cut method in mining the coal. The coal seams were covered by shale to a thickness of from 70 to 120 meters, and the quantity which had to be removed to carry out the open-cut mining as then planned was estimated at 320 million tons. Even assuming the oil content of the shale to be as low as one per cent, three million tons of crude oil could be obtained from the shale, which had to be removed anyway. Therefore samples were sent to Germany and Sweden for analysis and advice.

The analysis revealed that the oil content averaged only two per cent, which seemed too low to justify starting a large enterprise, but it also revealed that the oil content was not uniform. Thereupon the laboratory took samples from each layer of the shale in different parts of the mine and made a detailed physical and chemical analysis. It was found that the oil content varied from one per cent to fourteen per cent, with the average above six per cent. This attracted the attention of the Japanese navy, and a joint committee, composed of experts from the SMR laboratory, the Fushun laboratory, and the navy, was formed to expedite the project. After further study, these experts recommended using a dry distillation method to extract the oil. This

worked well in preliminary experiments, and in 1928 the SMR decided to erect a plant capable of handling 4,000 metric tons a day. Distillation actually commenced in December 1928.<sup>13</sup>

Although the method was technically successful, the company soon found that some changes were necessary to put the enterprise on an economically sound basis. The proceeds from the sale of ammonium sulphate constituted a significant part of the revenues of the plant, but the price of this chemical fluctuated violently after the end of World War I, and when it went down the price of the heavy oil had to be increased, to the embarrassment of the Japanese navy. It was therefore proposed that only part of the oil should go to the navy, with the rest to be further refined into gasoline and other light oil products and sold on the open market. When this was done, the financial worry was solved.<sup>14</sup>

Another important contribution of the South Manchurian Railway to the industrial development of Manchuria was the successful establishment of the iron and steel works at Anshan. In this achievement the Central Laboratory did not play so prominent a part, but the approach used by the company was similar. The Anshan iron deposit was accidentally discovered by the SMR's Geological Institute in August 1909. After a comprehensive survey the deposit was estimated to amount to 600 million tons, so the SMR was very interested in it. When negotiations with the Chinese officials at the local level failed, the matter was included in the "Twenty-One Demands." As a result, in the exchange of notes accompanying the treaty of May 25, 1915, China conceded to Japanese nationals the right to prospect for and operate coal and iron mines in certain designated regions of Fengtien and Kirin, including Anshan.<sup>15</sup>

In March, 1916, the Prosperity Iron Mining Company of Anshan (*An-shan t'ieh-k'uang chen-hsing wu-hsien kung-ssu*) was formed as a joint Sino-Japanese enterprise, but it was provided in the articles of incorporation that the iron ore was to be sold exclusively to the SMR.<sup>16</sup> The SMR then set up the Anshan Iron Works, which initially had two blast furnaces with a daily capacity of 200 metric tons apiece. The first furnace was blown in on April 29, 1919.

But for the next six years the plant worked well below capacity, both because the postwar depression made business unprofitable and because most of the Anshan ores were too low-grade to be easily smelted. After consulting American experts from Minnesota and performing many experiments themselves, the Japanese developed a process that roasted the ore and then used magnetic separation to produce briquets that contained 55 per cent iron and made a good blast furnace feed. By July, 1926, this ore preparation was successful on a production basis, and both of the blast furnaces were soon blown in. More furnaces had to be installed before long. In 1933 the firm was reorganized as the Shōwa Steel Works and separated from the SMR. The first ingot of steel was produced in April, 1935.<sup>17</sup>

While the South Manchurian Railway was an important force in the development of Manchurian industry, it was not the sole influence. Indeed, if one wants to explain the rapid development of industry during the period from 1910 to 1931, one must consider the war in Europe as the main factor. For after the first two years of the war shortages were widely felt, prices rose rapidly, and business everywhere outside Europe was prosperous. In Manchuria a number of new enterprises appeared, particularly after 1917. Some of these were started to meet local shortages, others to supply Japan with raw materials, while still others supported new tastes and modes of living.

One notable example was the expansion of public utilities. Many electric light companies were started at this time, by the SMR within the Japanese-controlled areas and by Chinese businessmen in various other cities. In 1925 the SMR's electricity plants were separated from the parent company. The Chinese plants remained fragmented until 1934, when all the plants—Japanese and Chinese—were amalgamated to form the Manchuria Electric Power Co., Ltd. (Manshū Denki K.K.).<sup>18</sup> The gas industry in Manchuria was started in 1902 when the Chinese Eastern Railway set up a small plant at Dairen to supply gas for lighting purposes. Another gas plant was established at the Fushun Colliery in 1909, but most of its output came to be used for industrial purposes. In the 1920's, the SMR built gas plants at Anshan, Mukden, Antung, and Changchun

(the city that was renamed Hsinking in the Manchukuo period). All of these latter plants sold most of their output to the consuming public.<sup>19</sup>

Among the early manufacturing industries were several that made food products. One of these was the flour milling industry, whose development in north Manchuria has already been described. In south Manchuria much of the wheat flour had formerly been imported, partly from the north and partly from Shanghai and the United States. Now the flour from the north did not come south, because it commanded a better market in war-torn Russia, while imports from China and America were also diminished because demand was more urgent elsewhere. The South Manchuria Flour Company, which had been established at Tiehling in 1906, expanded its operations, and competing plants were started—financed in part by the SMR. These enterprises were profitable for a time, but when the war ended American flour reappeared on the scene and the mills had to be closed down or run at a loss.<sup>20</sup> Another important food processing industry was beet sugar refining, whose development has already been described in detail in Chapter II. As the Japanese population in Manchuria increased, there arose establishments that made special Japanese food items, such as *sake*, *miso*, and Japanese soysauce. And, in the spreading prosperity, soft drink makers and ice factories found a market for the first time.

Another important manufacturing sector was the textile industry. The pioneer firms in this field produced hemp, tussah silk, and wool products. The Japanese involvement in the manufacture of gunny bags and the introduction of kenafe was described above; here it is only necessary to point out that besides these Japanese enterprises there were many small Chinese factories making hemp yarns, string, and coarse cloths whose activities also increased during this period. The production of tussah silk (that is, wild silk) was a traditional industry in Manchuria, but it was not very active before World War I. With the outbreak of the war, demand in Japan increased. Chinese filatures in Manchuria enlarged their output in response, and a major Japanese concern set up a plant at Antung, the center of the tussah silk-producing region, where it prepared the silk for export to Japan and the United States.<sup>21</sup> The woolen

industry also received a strong push during the war, when the Japanese government established the Man-Mō Keori K.K. to encourage wool production in Manchuria and Mongolia. There were also some Chinese firms engaged in making blankets and other coarse woolen goods, but their scale of operation was much smaller.

The cotton textile industry was slower to develop, because the Japanese at first did nothing to encourage it, since they hoped to reserve Manchuria as a market for Japanese exports of cotton cloth. However, when Chang Tso-lin set up a large mill at Mukden in 1921, the Japanese felt that they had little choice but to set up their own mills in Manchuria. Against the 20,000 spindles of the Mukden mill, three Japanese companies put up a total of 80,000 spindles. Fierce competition ensued and was ended only in 1931, when the Kwantung Army seized the Mukden company.<sup>22</sup>

In heavy industry, the SMR's blast furnaces at Anshan were not the only producers of iron and steel. Two other enterprises should be mentioned as well: the Penshihu Colliery and Iron Works (*Pen-hsi-hu mei-t'ieh kung-ssu*) and the Ta-Hua Electro-Metallurgical Company (*Ta-Hua tien-ch'i yeh-lien kung-ssu*). The Penshihu coal mine was first exploited during the Russo-Japanese War. In 1910 a mining corporation was formed jointly by Chinese and Japanese businessmen; it was reorganized the next year as the Penshihu Colliery and Iron Works. A blast furnace was installed and began producing iron in 1915. Both the coal and iron ore at Penshihu were low in phosphor and sulfur content, and therefore found a ready market with the Japanese navy, which needed low phosphor iron for its munitions. The company had temporary financial problems in the early 1920's, when the navy's ship-building plans were sharply curtailed, but in 1923 when the general economic outlook became better the company resumed its operations.<sup>23</sup> The Ta-Hua Electro-Metallurgical Company, which despite its name was a Japanese firm, also made special metals for military use. It was organized by a Japanese expert named Kamijima Keitoku, who devoted much time to the study of electric furnaces and the making of special steels. He set up a small plant at Dairen and produced various high

quality alloys that were highly regarded by Japanese military circles, thus assuring the success of the enterprise.<sup>24</sup>

Besides these major producers, there were many small local factories making cast iron and iron products. Nonferrous metals, such as copper, lead, and zinc, were also produced in small lots by native smelting methods. In addition, certain nonmetallic minerals like asbestos, talc, and fluorspar were extracted from primitive mines and exported. More significant perhaps was the steady increase in the production of salt for export to Japan, where it was used to make industrial chemicals.

Manchuria also began to develop its own modern chemical sector during this period, just when its traditional chemical industry, which was completely dominated by the making of soybean oil and cake, began to decline. Among the new products were simple medicines, industrial chemicals, fertilizers, dyestuffs and paints, soap and candles, matches, paper, leather, and rubber goods.<sup>25</sup>

In the machinery industry, independent plants were comparatively few. The largest machinery factory was the workshop of the SMR, which not only built and repaired equipment for the railroad but also produced machines for other industries. Similar work was done by the machine shops of the Fushun Colliery and the Anshan Iron Works. Another important enterprise in this field was the Mukden Arsenal, which, although set up by Chang Tso-lin primarily to make arms and ammunition, soon extended its activities to make other machinery and chemicals.<sup>26</sup>

These, then, were some of the new industries started during World War I and the immediate postwar period. As Table 20 shows, the chemicals group made the most rapid advance, with metals next. The growth rate of the manufacturing sector as a whole from 1911 to 1931 averaged eight per cent a year, while the rate for all industries, including mining and public utilities, was roughly nine per cent a year. These rates must be considered quite high and would not have been possible without the stimulation of the war in Europe.

But, as indicated earlier, many enterprises had to be closed down after the war, and even those that managed to continue operating found conditions difficult. The situation improved somewhat after 1923, but in the years after 1927 falling world prices again made trade unprofitable. Here the immediate effects felt by the Japanese and Chinese merchants were different. As explained in Chapter II, after 1926 the prices in gold currency countries fell, while in silver currency countries prices rose for a time. Thus the Chinese merchants, who dealt in silver, appeared to suffer less. In addition, of course, this was a period of rising Chinese national feeling, which encouraged the local authorities in Manchuria to support projects that undercut Japanese economic ambitions. One example was Chang Tso-lin's cotton mill in Mukden. Another was the Tahushan-T'ungliao Railway, which was begun in 1921, and the other railroads which followed. Economic depression always causes popular discontent, but in this case it was exacerbated by the growing conflict between Chinese nationalism and Japanese imperial expansion. The resulting explosion ushered in a new era.

### *The Manchukuo Period (1932-1945)*

#### *Consolidation and preparation (1932-1936)*

Shortly after the start of Japan's campaign of aggression in Manchuria, the Kwantung Army asked the SMR to organize a body of experts to collect and analyze economic information and to plan Manchuria's economic development. The SMR accordingly set up an economic research committee, with its own research staff as the nucleus but with other SMR and army personnel included. The activities of this committee covered a very wide field, ranging from plans to set up a new system of money and banking down to such small things as a plan to improve the two-wheeled cart then in use in some parts of Manchuria.

By the beginning of 1933 these plans were well advanced, and on Manchukuo's first anniversary (March 1, 1933) the government was able to announce its basic economic plans and policies.<sup>27</sup> The announcement began

with a denunciation of the baneful effects of unbridled capitalism and emphasized the necessity of some measure of national direction and control. Four cardinal principles were enumerated. The first was that the interest of the people as a whole should be the chief concern and that any attempt on the part of particular classes of people to monopolize the benefits of economic development should be prevented. The second was that to achieve a coordinated development of all branches of the economy the exercise of national control was necessary. The third principle paid lip service to the principles of the open door and of equal opportunity. The fourth principle emphasized the close and inseparable relationship between Japan and Manchukuo. Then the major policies to be followed were summarily mentioned under several broad headings, such as the perfection of transportation, the development of agriculture, the development of mining and manufacturing, the adjustment of credit, aid to commerce, and the improvement of the private economy.

The targets proposed for agriculture have already been discussed in detail in Chapter II. In regard to mining and manufacturing, detailed plans had not been worked out, but certain principles were emphasized. Mineral resources essential to the national defense were to be exploited only by "special companies"<sup>28</sup> set up for this purpose. The unification of the various coal mines was also stressed. In the manufacturing sector, the following industries were to be brought under national control: metals, machinery, paper and pulp, soda, cement, vegetable oil, flour, alcohol and liquor, tussah silk, and cotton. A casual examination of this list will reveal that it covers virtually all the major industries then in operation in Manchuria. It is difficult to see how such industries as oil milling, tussah silk reeling, or brewing and distilling were connected with national defense, but they had one feature in common. They were all traditional industries in which the Chinese interest was heavy. By bringing them under control, the Japanese hold over the economy was strengthened.

This was particularly clear in the case of coal mines. The Manchuria Coal Mining Company was formed in 1934 to unify and rationalize a number of mines. But the Fushun mine and the other mines belonging to the SMR were not included in this "special company." The Penshihu mine also remained outside. Among the mines taken over were those previously run by the Mukden provincial government, the Mu-leng and Hao-kang mines in Kirin, and the Russian-operated mine at Chalainor—in short, the mines that did not belong to Japanese interests. Colonel Kawamoto Daisaku, the very person who triggered the bomb that killed Chang Tso-lin, was made director-general of the new company, perhaps as a reward for his past exploits.<sup>29</sup> The company performed very poorly under Kawamoto, however, and a great deal of effort was spent trying to get him transferred. When the company was broken down into its component units once again, the mines did very well.<sup>30</sup> This case serves to show that the special companies were sometimes set up mainly for the purpose of consolidating Japanese control, and that the principle of "one industry, one company,"<sup>31</sup> which was widely emphasized at the beginning of the Manchukuo period, was not always beneficial.

The special company system was not the invention of the Kwantung Army; its origins must be traced to Japan herself. During the course of Japan's early economic development, such companies were used in setting up banks, industrial enterprises, and companies for colonial development. To these companies the Japanese government supplied capital and extended other privileges, such as guaranteeing dividend payments to the private investors. The companies were often given priority access to scarce raw materials, various tax exemptions, and other assistance. On the other hand, the government retained the right to supervise and control their operations to a considerable degree.<sup>32</sup> The Kwantung Army disliked capitalism, but it recognized that it needed help to carry out its plans. The special company system was therefore quite attractive, for it made available the capital, experience, and technical skill of private enterprise, while real control remained in the government's hands. The private shareholders enjoyed good dividends but little else. Besides

the Manchuria Coal Mining Company, which has already been mentioned, there were special companies in the fields of mining, petroleum, electric power, chemicals, light metals, and so on. (It should perhaps be noted here that not all of these were "special companies;" some were technically "semi-special companies."<sup>33</sup> This reflected certain legal technicalities, not the relative importance of the various enterprises.)

Besides this activity in the mining and manufacturing sector, there were other fundamental reforms carried out in the preparatory period, particularly in regard to currency, public finance, and transportation. It is well known that the currency and banking system in Manchuria was in a chaotic state before the Manchukuo period. Plans for reform had been suggested on several occasions, but due to the selfishness of private interests and the lack of outstanding leadership, actual reforms had never been carried out. It was to the credit of the new regime that a plan was soon formulated and put into operation. On June 13, 1932, laws were introduced inaugurating the Bank of Manchou and creating a new currency.<sup>34</sup> The various currencies already in circulation had to be exchanged at fixed rates and went out of use within a comparatively short time. In the beginning the new currency was based on the silver standard, with one yuan containing 23.91 grammes of silver. The Bank of Manchou tried at first to keep the yuan more or less in line with world silver prices, but had to abandon the attempt in April, 1935. It happened that the exchange rate between the yuan and the Japanese yen was quite stable during this period, at about 100 yuan to 108 or 109 yen. This naturally gave rise to the thought of keeping the two currencies at par. By conscious effort on the part of both central banks the disparity was closed after about four months, and the two currencies were kept on a par from then until the end of World War II.

Historically, public finance in Manchuria had been decentralized, and this tendency was aggravated during the warload period. The Manchukuo government quickly instituted reforms. The collection and expenditure of state revenues was centralized, and an accounting bureau was established to supervise these matters. A clear demarcation was made between national and

local finances. The maritime customs revenues were soon turned over to the Manchukuo government and, together with the land tax and taxes on business, provided the basis for a balanced budget.

In the field of transportation the basic economic policy statement in 1933 mentioned that the railways would be extended to 10,000 kilometers. It also promised the building of new and improved highways. In February, 1933, the entire management of the Manchukuo state railways, including the construction of new lines, was entrusted to the SMR. In the same year the U.S.S.R. offered to discuss the sale of the Chinese Eastern Railway. After extended bargaining the CER was finally sold to Manchukuo in March, 1935; it too was put under the management of the SMR. Thus the whole system of railways in Manchuria was unified and extended. In 1937 the operating mileage for passenger service was reported to be 9,248 kilometers and that for freight traffic 9,655 kilometers.<sup>35</sup> Thus in about five years the goal of 10,000 kilometers was also reached.

As these preparations were going on, Manchukuo's first five-year plan for industrial development was being formulated. By August, 1936, it had taken preliminary form. After further consideration and modification it was then made public.

#### *The First Five-Year Plan (1937-1941)*

The first five-year plan was basically the work of the Kwantung Army. The army not only formulated the plan (with the help of the SMR's staff); it also remained in control of its implementation. Two important channels through which this control was exercised were the Board of General Affairs of the Manchukuo government and the Manchuria Industrial Development Company. The executive power of the Manchukuo government was nominally exercised by the State Council, which was presided over by the prime minister. The prime minister in turn was a figurehead with little administrative experience (such as Chang Ching-hui, an old militarist who held this office from 1935 to 1945). The Board of Central Affairs was placed under the prime minister, supposedly

to function as a secretariat. In fact, however, this board was the nerve center of the executive branch of the government. Its director was always a Japanese of considerable ability and experience, and the allocation of resources was completely under his control. He, in his turn, made no important decisions without consulting the army.

The second channel of army control was through the Manchuria Industrial Development Company. As already indicated, the army and the SMR worked together in formulating the five-year plan, and it was widely expected that the SMR would play a leading role in carrying it out. But the army had other ideas. As early as 1933 the army had advocated that the SMR be put directly under its own control, but had withdrawn the plan when the railroad's 30,000 employees and the Tokyo financial market had reacted very strongly against it.<sup>36</sup> Then in 1937 the army invited the president of the Nissan financial group, Ayukawa Gisuke, to move his headquarters to Hsinking and form the Manchuria Industrial Development Company. This was to be a holding company that would coordinate the developments in coal, iron and steel, light metals, automobiles and aircraft, some chemicals, machine tools, and so on. The Nissan group would contribute one half of the company's initial capital of ¥450 million, while the Manchukuo government would supply the other half. When Ayukawa agreed, the SMR had little choice but to reorient its own activities. It disposed of its industrial subsidiaries (except the Fushun coal mine) and concentrated on its increasingly heavy responsibilities in the field of transportation.<sup>37</sup>

The army made its generous offer to Nissan because it wanted to attract capital from Japan and abroad but strongly distrusted the older financial groups such as Mitsui and Mitsubishi. Both sides were eventually disappointed, however. Ayukawa, despite his good relations with investors in Japan and the United States, was unable to attract much new capital to Manchuria. At the same time, he was frustrated by the numerous restrictions placed on his work by the government planners, who expected him simply to fulfill their targets. When it became clear how little real authority Ayukawa really had, he returned to Japan, leaving a deputy to act for him in Hsinking.<sup>38</sup>

Manchukuo's original five-year plan was announced early in 1937, but events soon outran it and it had to be revised several times. When war broke out between China and Japan in July, the Japanese government developed a four-year plan for the entire yen bloc, covering many strategic products. The Manchukuo planners naturally had to modify their own targets accordingly, and they announced a revised plan in April, 1938. When war broke out in Europe in September, 1939, further modifications were required, because Manchukuo had intended to sell soybeans and other oil seeds to Germany and Italy but delivery was now impossible. In the same year Japan adopted a mobilization plan, and Manchukuo followed suit. This meant, in reality, that long-range planning was replaced by a series of *ad hoc* adjustments to the circumstances of the moment. In 1941 the first five-year plan was due to expire, and representatives of different regions of the yen bloc went to Tokyo to discuss plans for the future. By November a second five-year plan, encompassing the whole bloc, had been worked out, but then came Pearl Harbor, and planning was again shifted to an *ad hoc* basis.

As already mentioned, the Japanese government developed a four-year plan for the entire yen bloc that was announced in 1938. The goal of the plan was to make the bloc self-sufficient in a number of strategic items, and it called for major increases in the output of liquid fuel, nonferrous metals, iron and steel, industrial chemicals, and machinery and vehicles.<sup>39</sup> A comparison of the targets of Manchukuo's original five-year plan and of the revised plan (see Table 16) will quickly reveal how heavily the yen bloc plan influenced Manchukuo's revised plan. In their enthusiasm, the planners set unrealistically high targets, with the natural result that achievements often fell far short of the goals.

In the iron and steel industry, the five-year plan embraced the Anshan (or Shōwa) works, the Penshihu company, and the Tungpientao development project. Of these, the first two have already been described; the Tungpientao project was a company to develop coal and iron resources in a region along the Korean border, which preliminary reports in 1932 described

Table 16

## Manchukuo's First Five-Year Plan

Industries and Products	Units	Capacity in 1936	Targets of Original Plan (annual)
<b>Iron and steel</b>			
Pig iron	metric tons	850,000	2,530,000
Steel ingots	"	580,000	2,000,000
Rolled steel	"	400,000	1,500,000
Special steel	"	—	—
<b>Coal</b>	"	11,700,000	27,160,000
<b>Liquid Fuel</b>			
Liquefaction of coal	"	—	800,000
Shale oil	"	—	800,000
Alcohol	"	15,000	57,000
<b>Electricity</b>			
Thermal	kilowatts	554,000	815,000
Hydroelectric	"	—	590,000
<b>Nonferrous metals</b>			
Aluminum	metric tons	—	20,000
Magnesium	"	—	500
Lead	"	1,220	12,400
Zinc	"	—	6,000
Copper	"	—	—
Gold	yen	12,108	212,000
<b>Chemicals</b>			
Soda ash	metric tons	21,000	72,000
Ammonium sulphate	"	—	202,000
Salt	"	338,683	973,185
<b>Machinery</b>			
Machine tools		—	—
Automobiles		—	4,000
Airplanes		—	340
Locomotives		650	1,644
Rolling stock		6,900	18,490
<b>Asbestos</b>	metric tons	150	5,000

Continued on following page.

Table 16 (continued)

	Targets of Revised Plan	Peak Production (usually 1943)
Iron and steel		
Pig iron	4,850,000	1,710,000
Steel ingots	3,550,000	645,000
Rolled steel	1,700,000	485,000
Special steel	100,000	—
Coal	34,910,000	25,626,000
Liquid fuel		
Liquefaction of coal	1,770,000	—
Shale oil	650,000	—
Alcohol	57,000	—
Electricity		
Thermal	1,330,000	—
Hydroelectric	1,240,000	—
Nonferrous metals		
Aluminum	30,000	8,157
Magnesium	3,000	331
Lead	29,000	11,230
Zinc	50,000	8,895
Copper	3,000	2,291
Gold	304,012	(2,855 kg.)
Chemicals		
Soda ash	72,000	65,000
Ammonium sulphate	453,000	199,660
Salt	1,402,000	883,290
Machinery		
Machine tools	5,000	—
Automobiles	30,000	2,800
Airplanes	5,000	1,200
Locomotives	—	—
Rolling stock	—	—
Asbestos	5,000	—

Sources: [Based on SMR publications. Exact source not located: R.W.H.] .

in glowing—but largely unjustified—terms. Kamijima Keidoku's Ta-Hua Electro-Metallurgical Company was not included in the original plan, because Kamijima at first refused to submit to control by the Manchuria Industrial Development Company. Kamijima's company produced only a few hundred tons of special steel before 1931, and therefore it is not clear how much of the revised plan's target of 100,000 tons of special steel he was expected to meet, nor where the rest of the output was to come from.

The coal mines of Manchukuo can be divided into three groups: the Mantetsu group (the SMR's mines), the Mantan group (the mines absorbed by the Manchuria Coal Mining Company), and a miscellaneous third group (including the Penshihu mine). In 1936 the Mantetsu group produced about 10.6 million metric tons of coal, compared to 2.7 million for the Mantan group and about 900,000 for the third.<sup>40</sup> But once Colonel Kawamoto was removed as head of the Manchuria Coal Mining Company, the Mantan group surged ahead and by 1944 was producing about 21 million tons, while production at Fushun stagnated.<sup>41</sup>

The liquid fuel industry was one of the weakest points in Japan's wartime economy. As indicated in Table 16, Manchukuo's revised plan called for the production of 1,770,000 metric tons of crude oil from coal and 650,000 tons from shale annually. At that time, the liquefaction of coal could be carried out by three processes: the Bergius method, the Fischer-Tropsch process, or low temperature combustion. All three methods were tried in Manchukuo, but none was successful on a large scale, partly because it was no longer possible to get the necessary equipment from Germany. But German data indicate that it took about eight tons of coal for every ton of crude oil produced,<sup>42</sup> which suggests that Manchukuo's coal resources would probably have been inadequate even if a successful method of treating coal had been found. The extraction of oil from shale had of course been successfully carried out in Manchuria before 1931 but it proved impossible to expand this method as dramatically as the revised plan called for.<sup>43</sup> As a whole, the liquid fuel plan was a distinct failure.

By contrast, the development of the electric power industry was a marked success. The expanded plan called for four major new sources of electricity and for a network of high tension transmission lines to link sources and users. Two of the new units were thermal plants located at the Fushun and Fushin coal mines, where they enjoyed abundant supplies of waste coal. The other two units were hydroelectric: one at Suifeng on the Yalu River, and the other at Fengman on the upper Sungari River. Some of the turbines and generators had originally been ordered abroad, but when shipment was prevented by the war, all the necessary equipment was successfully built in Japan.

Nonferrous metals made reasonably good progress in this period, although none reached the inflated target levels set forth in the revised plan. The SMR's Central Laboratory carried out research (later continued by a subsidiary of the Manchuria Industrial Development Company) that led to a successful method of extracting aluminum from the shale that existed so abundantly in Manchuria. The cost compared favorably with the Bayer-Hall process of reducing bauxite.<sup>44</sup>

The chemicals sector also grew rather well. The SMR had thought of building a soda ash factory as early as 1923 but had delayed for fear of competition from the British firm of Brunner Mond, whose product was strongly entrenched in the Far East market. After Manchukuo was formed, the Kwantung Army carried out the SMR's plans, building a plant that began production in August, 1937. Manchuria had been producing ammonium sulphate since the 1910's, and production was augmented during the Manchukuo period. In the same period, many chemical enterprises were started which were not included in the five-year plan. For example, the Manchuria Electro-Chemical Company was set up in 1938 to produce carbide and its derivatives, such as nitrate of lime and synthetic fibres.<sup>45</sup>

Heavy machine industry was not included in the original five-year plan because it was expected that Japan could supply all of Manchuria's needs in this field. When the Manchuria Industrial Development Company was first started, it planned to cooperate with Ford to develop the automobile industry

and with the German firm of Junker to develop the aircraft industry. These plans could not be realized, but automobile assembly plants were set up with the participation of Dowa and Nissan, and they were later able to turn out high grade training airplanes that were well received by the Japanese military.<sup>46</sup>

The five-year plan ignored the consumer goods sector, yet Manchukuo's light industry grew quite a bit during the plan period. This occurred because in 1938 the Japanese government declared that it planned to curtail trade with other yen bloc countries, because such trade earned no foreign exchange. In response, those Japanese industries that were accustomed in selling in Manchuria hurried to ship their plants and equipment there.<sup>47</sup> Despite this temporary stimulus, however, Manchuria's consumer goods industries generally fell behind her heavy industries in growth. One exception was the textile industry, which grew because the five-year plan for agriculture encouraged the production of textile materials.

One general problem that affected all sectors of the economy to some extent during this period was the shortage of labor. It will be recalled that when Manchukuo was first established, the policy was to restrict Chinese immigration sharply. When the five-year plan was put into effect, a shortage of labor was immediately felt. The government moved to relax its earlier restrictions, but two factors tended to counteract this effort. First, the Bank of Manchou, out of concern for Manchukuo's balance of payments, restricted remittances to China. Second, a bad explosion in the Penshihu mine led to a widespread apprehension, and a large number of workers returned to China. Under these circumstances, a labor turnover exceeding 200 per cent a year was common in Manchuria's mines.<sup>48</sup>

### *War Exhaustion (1942-1945)*

Most industries in Manchuria reached a peak of production in 1942 or 1943 and then slumped badly. One important factor, of course, was the decline in morale that inevitably set in when it became clear that the war was not being won. The effect of shipping losses on supplies of critical equipment

has already been mentioned at several points. For Manchukuo, the first direct impact of the war came in July, 1944, when American B-29's bombed the Anshan iron works.

As the war progressed, the problem of an inadequate labor supply became increasingly acute. Realizing that its attempts to encourage immigration were not having much success, the government tried to improve the efficiency of the labor force already in the country. The employers' former freedom to bid up wages was sharply curtailed, and wages were standardized. Minimum rations of the daily necessities were established to support morale. Farm youths were conscripted to work in mines and factories. A worker's freedom to change jobs was severely restricted. Farmers were supplied with simple machines and were encouraged to form mutual-aid teams, in the hope that this might free some rural labor to work in industry. Not surprisingly, in the face of these restrictions and pressures, a general atmosphere of resentment prevailed. One indication of the deterioration of labor efficiency that set in can be found in the record of daily output per miner at the Fushun mine. Taking ouput in 1937 as 100, the output in 1940 was 74, and then fell to 64 in 1942 and to 44 in 1943.<sup>49</sup>

Another serious problem was the shortage of coal, brought about largely because of a decline in output at Fushun. (The output of the Mantan group, it will be recalled, was growing rapidly). In the wintertime, many light industries had to close down for lack of fuel.<sup>50</sup>

Another factor was inadequate transportation. The SMR with its links to railroads in Korea and China, found that cars sent to these regions were returned only after long delays, if at all.<sup>51</sup>

In view of Manchuria's earlier history as an agricultural country, the successes of the five-year plan period were not easily won, and seemed to portend further achievement in the future. Then came the Russian occupation. The degree of damage done by the Russians was estimated by an American, Edwin W. Pauley. Later, the Chinese government asked a group of Japanese experts in Manchuria to check Pauley's figures. The results of the two reports

are given in Table 17. In general, the two sets of estimates agree, and they indicate clearly the extent of the Russian depredations. It has since been reported that the U.S.S.R. has returned some of the dismantled factories to Communist China. This may mitigate—but can hardly undo—the damage.

Table 17  
Russian Damage to Manchurian Industries

Industry	Pauley's Estimate		Japanese Estimate	
	Amount of Loss (in \$1,000)	Capacity Lost (percentage)	Amount of Loss (in \$1,000)	Capacity Lost (percentage)
Electricity	201,000	71	219,540	60
Iron & steel	131,260	50-100	204,050	60-100
Coal mines	50,000	90	49,720	80
Railways	121,390	50-100	195,756	50-100
Machine	163,000	80	158,870	68
Liquid fuel	11,380	75	40,719	90
Chemicals	14,000	50	79,786	33
Cement	23,000	50	23,187	54
Nonferrous	10,000	75	60,815	50-100
Textiles	38,000	75	135,113	50
Pulp & paper	7,000	30	13,962	80
Communications	25,000	20-100	4,588	30
Food	—	—	59,056	50
<b>TOTAL</b>	<b>895,030</b>		<b>1,233,164</b>	

Sources: Edwin W. Pauley, *Report on Japanese Assets in Manchuria to the President of the United States*, (Washington, D.C., 1946); *Tung-pei ching-chi hsiao ts'ung-shu* (Small collection of books on the economy of Manchuria; [place and date uncertain: R.W.H.]).

#### *The Quantitative Record: An Aggregate Index of Industrial Production, 1911-1942*

When the Japanese gained control of Kwantung in 1905, they began almost at once to gather statistics on both industry and agriculture in the areas under their jurisdiction. In agriculture, these Kwantung data are of limited usefulness, since the farm land in the Japanese-controlled areas constituted less than three per cent of Manchuria's total crop area.<sup>52</sup> In industry, however, the Kwantung peninsula and the SMR zone contained a highly disproportionate amount of Manchuria's total productive capacity. Therefore it

is possible, by making careful use of the Kwantung data, to derive an index of industrial production for all of Manchuria that goes back as far as 1911. (It will be recalled that the index of agricultural production derived in Chapter II begins only with 1924).

In celebration of the Kwantung Administration's thirtieth anniversary, the book *Kantōkyoku tōkei sanjūnen shi* (Thirty years' statistics of the Kwantung Administration) was published in 1937. This volume gives production data for the years 1910 to 1936. Additional information was published in the *Kantōkyoku tōkeisho* (Kwantung statistical yearbook) for 1936. Before using these materials, however, it is necessary to answer several questions: Do the data seem accurate? Do they encompass all of Kwantung's output? If not, can they be expanded? What per cent of Manchuria's total industrial output was produced in Kwantung? Can the remainder be estimated in some way? I will have something to say about each of these questions in turn.

One way to check the accuracy of the Kwantung data is to compare them with figures derived from other studies. Unfortunately, such corroborative evidence is not easy to find. In the official Kwantung statistics, time series are given for fifty manufactured commodities, plus mining and public utilities. Of these series, at least six (coal, electricity, pig iron, cement, soybean cake, and cotton yarn) can be partially verified. In Table 18 the parallel figures are given to facilitate comparison. In general the agreement is surprisingly good. The discrepancy in the cement data for 1935 and 1936 occurs because more plants were set up outside the Kwantung area at that time.

Certain qualitative checks can also be made on the Kwantung data. For example, the Shōwa steel works did not begin production until 1935, yet the Kwantung data show steel being produced much earlier. This casts doubt on the accuracy of the Kwantung statistics, until it is remembered that the Ta-Hua Electro-Metallurgical Company began its operations well before the Shōwa plant.

In 1934 and 1936 the Kwantung Administration and the government of Manchukuo joined forces to carry out industrial censuses for all of

Table 18

A Comparison of Kwantung Statistics  
with Statistics from Other Sources

Year	Coal (in 1,000 m.t.)		Electricity (in million kw-hr)		Cotton Yarn, Index (1926 = 100)	
	Kwantung	Other	Kwantung	Other	Kwantung	Other
1910	—	—	11	13	—	—
1911	—	—	16	19	—	—
1912	—	—	18	22	—	—
1913	—	—	22	26	—	—
1914	—	—	27	34	—	—
1915	—	—	35	46	—	—
1916	—	—	49	63	—	—
1917	—	—	70	88	—	—
1918	2,516	3,417	74	113	—	—
1919	3,164	3,840	94	145	—	—
1920	4,174	4,022	74	130	—	—
1921	3,463	3,544	87	140	—	—
1922	4,006	4,605	96	153	—	—
1923	6,429	5,903	112	184	—	3.5
1924	6,049	6,689	130	214	1.4	27.7
1925	6,632	6,948	163	239	66.1	76.1
1926	6,977	7,855	189	295	100.0	100.0
1927	8,754	9,910	218	341	117.1	98.0
1928	8,473	9,518	252	403	112.6	101.1
1929	9,019	10,024	281	459	151.6	125.3
1930	9,014	10,179	305	504	224.0	141.3
1931	8,018	9,124	335	543	223.8	147.8
1932	7,252	7,099	349	593	225.5	186.4
1933	7,687	9,063	411	662	240.1	209.8
1934	8,774	10,433	511	772	245.5	235.7
1935	9,926	11,056	918	1,084	304.1	287.6
1936	8,881	11,646	1,147	1,350	423.2	324.7
	Soybean Cake (1,000)		Pig Iron (in 1,000 m.t.)		Cement (in 1,000 barrels)	
Year	Kwantung	Other	Kwantung	Other	Kwantung	Other
1910	2,649	2,101	—	—	147	148
1911	8,333	7,491	—	—	150	139
1912	10,494	9,092	—	—	140	181
1913	10,527	9,242	—	—	180	194
1914	6,005	4,938	—	—	180	204
1915	14,434	16,705	35	29	180	220
1916	21,988	19,126	36	49	200	220
1917	33,706	25,106	75	40	200	220
1918	34,633	21,343	47	45	221	224
1919	37,407	27,934	40	1,126	217	222
1920	28,791	25,756	82	135	193	193
1921	35,042	24,774	111	88	233	233
1922	30,896	26,918	60	67	244	235
1923	40,476	30,451	72	98	337	248
1924	38,289	27,572	81	116	650	601
1925	30,130	27,377	96	140	574	518
1926	37,465	36,219	146	197	736	632
1927	33,259	29,664	194	243	700	661
1928	25,164	22,575	211	284	928	892
1929	23,821	17,763	218	294	1,212	1,215
1930	32,360	17,254	261	348	1,112	1,143
1931	34,006	30,835	276	342	929	906
1932	36,063	30,924	365	368	638	640
1933	20,888	19,618	437	434	1,131	1,087
1934	26,434	23,683	472	476	1,972	1,368
1935	24,094	23,424	607	608	1,628	2,223
1936	19,457	19,457	—	603	1,724	3,410

Sources: See pp. 91.

Sources for Table 18:

Coal: Kwantung: *Kantōkyoku tōkeisho* (Statistics volume for the Kwantung Administration; Dairen, 1936), Table 74-75. Other: Publications of the Geological Institute of the SMR [Precise reference not located: R.W.H.].

Electricity: Kwantung: *Kantōkyoku tōkeisho* (Statistics volume for the Kwantung Administration; Dairen, 1936), p. 382. Other: *Manshu denki kyōkyū jigyo gaikyo* (The outlook for the electric power industry in Manchuria; Dairen, 1938), pp. 12-13.

Cotton yarn: Kwantung: Data on value of output from *Kantōkyoku tōkeisho* (Statistics volume for the Kwantung Administration; Dairen, 1936). Deflated by price index from *Manshū keizai nenpō* (Economic yearbook of Manchuria). Other: *Manshū menbōseki sangyōchi jōken* (Conditions in the cotton textile industry regions of Manchuria; [place and date uncertain: R.W.H.]).

Soybean cake: Kwantung: *Minami Manshū Tetsudō Kabushiki Kaisha sanjūnen ryakushi* (A brief history of thirty years of the South Manchurian Railway Company; Dairen, 1937). Other: For 1910-1922: *Manshu ni okeru daizuyu gyō* (The soybean oil industry in Manchuria; Dairen, 1923). For 1923-1925: The *Annual Report* of the Chinese Eastern Railway for 1928. For 1926-1930: *The Manchoukuo Yearbook*, 1932, p. 193. For 1931-1936: *The Manchoukuo Yearbook*, 1939, p. 823.

Pig iron: Kwantung: *Minami Manshū Tetsudō Kabushiki Kaisha sanjūnen ryakushi* (A brief history of thirty years of the South Manchurian Railway Company; Dairen, 1937). Other: Publications of the Geological Institute of the SMR [Precise reference not located: R.W.H.].

Cement: Kwantung: *Minami Manshū Tetsudō Kabushiki Kaisha sanjūnen ryakushi* (A brief history of thirty years of the South Manchurian Railway; Dairen, 1937); *Kantōkyoku tōkeisho* (Statistics volume for the Kwantung Administration; Dairen, 1936). Other: An SMR study of the cement industry [Precise reference not located: R.W.H.].

Manchuria.<sup>53</sup> A comparison of the data from the Kwantung portion of the 1936 factory census with the statistics from *Kantōkyoku tōkei sanjūnen shi* is given in Table 19. In the aggregate, the *Kantōkyoku tōkei sanjūnen shi* data covers only a bit more than half of the output recorded by the census. However, the output figures for individual products are in much closer agreement. Thus,

Table 19

Comparison between Official Kwantung Statistics  
and 1936 Factory Census

(in 1,000 yen)

	A. Official	B. Census	A/B
Total value:	145,346	278,215	0.52
 Value by products:			
Cotton yarn	13,367	17,599	0.76
Piece goods	5,945	6,989	0.85
Pig iron & steel	10,360	16,290	0.64
Cast iron	1,455	1,411	1.03
Bricks & tiles	2,630	3,509	0.75
Cement	4,110	5,258	0.78
Glass	2,370	2,332	1.02
Soybean products	61,045	64,416	0.95
Liquor	4,462	5,105	0.87
Cigarettes	7,424	7,995	0.93
Timber	11,549	13,023	0.89
Paper	2,411	3,499	0.69
Fertilizer	1,448	1,573	0.92
Miso & soysauce	1,623	1,455	1.16
Candy	1,548	1,470	1.13
Matches	2,411	3,499	0.61
Wheat flour	576	1,613	0.36
Dye	165	165	1.00
Paint	1,806	975	1.85
Leather	646	816	0.79
Soft drinks	401	424	0.95
Ice	510	753	0.68

[Sources not located: R.W.H.]

the overall discrepancy is largely a result of the fact that the *Kantōkyoku tōkei sanjūnen shi* figures cover only fifty commodities, and not necessarily the most important ones at that. To some extent, however, it is possible to compensate for the omissions. From various other sources, I have gathered time series for salt, coal, and iron ore in the mining sector, for electricity, gas, and water in the public utilities sector, and for machinery and processed marine products in the manufacturing sector. I had also hoped to include a series for shale oil, but was unable to find appropriate price data; had shale oil been included, the chemicals sector would have exhibited even more rapid growth than it did.

The *Kantōkyoku tōkei sanjūnen shi* data and these supplementary series were then combined to form Table 20, which gives the estimated gross value of industrial production for the Japanese-controlled areas from 1910 to 1936, in constant 1926 prices. (It should be mentioned here that a few of the series given in *Kantōkyoku tōkei sanjūnen shi* have been omitted from Table 20, because they contained only intermittent entries. The total value of the excluded series amounted to less than one per cent of the aggregate output.) In general, the original series were given in current prices and had to be deflated. Where possible, a separate price index was constructed for each commodity. Cases in point are cotton yarn, tussah silk, piece goods, cast iron products, cement, glass, paper, matches, and cigarettes. Where this was not possible, the series were deflated by a general price index that was calculated by the SMR staff. For interested readers, this index is given Table 21.

The data in Table 20 are an estimate of gross industrial output. Admittedly, it would be desirable to have series based instead on value added. An examination of factory statistics for 1936, 1938, and 1940 revealed that within individual industries the value added was a reasonably stable percentage of gross value. Therefore I applied these percentages to the original time series from *Kantōkyoku tōkei sanjūnen shi* and the supplementary sources, thereby deriving rough estimates of the value added, industry by industry. These new series were then aggregated once again to form Table 22. Given the methodology,

Table 20

Gross Value of Industrial Production at 1926 Prices  
in the Kwantung Leased Territory and South Manchuria Railway Zone 1910-1936  
(in 1,000 yen)

	Mining	Public Utilities	Manufacturing						TOTAL	Index Number (1926=100)	
			Food Beverage & Tobacco	Textile	Wood Products	Metal	Machinery	Ceramics	Vegetable Oil	Chemicals	Subtotal
1910	8,602	680	2,071	—	—	—	4,226	2,554	76	16,754	26,036
1911	11,578	1,008	1,832	—	—	—	5,191	3,283	25,045	35,462	48,048
1912	18,938	1,161	2,756	3	—	—	4,606	1,704	32,256	163	41,488
1913	20,395	1,352	4,090	—	—	—	6,120	1,813	31,968	377	44,368
1914	22,096	1,625	7,502	—	—	—	5,451	1,821	18,085	350	33,209
1915	21,682	2,210	7,639	5	—	—	6,139	1,724	43,179	516	60,602
1916	21,803	2,959	8,294	—	—	—	1,440	8,732	2,306	447	84,494
1917	25,335	4,078	8,834	14	—	—	3,000	12,751	2,601	105,347	2,606
1918	23,686	4,561	11,846	43	—	—	1,893	20,538	3,620	107,868	1,928
1919	28,344	5,702	12,438	56	—	—	1,592	20,443	4,643	115,616	2,160
1920	37,604	4,962	11,360	523	—	—	3,291	10,746	2,838	90,011	897
1921	30,543	5,526	12,924	3,251	—	—	4,425	11,622	2,792	107,009	1,247
1922	35,517	6,014	17,142	1,165	—	—	2,404	10,267	2,906	94,969	1,415
1923	55,461	6,843	25,061	3,442	8,627	—	3,109	9,274	3,669	125,696	2,376
1924	52,844	7,701	19,772	3,426	4,257	3,645	9,505	5,680	117,990	2,400	166,675
1925	57,787	9,358	25,851	7,809	3,136	4,489	8,907	4,719	94,718	2,416	152,045
1926	61,691	10,748	19,522	11,955	4,789	6,543	11,419	8,740	123,176	3,548	189,692
1927	76,688	12,219	23,230	13,097	5,694	8,273	12,015	10,503	103,561	6,699	183,074
1928	74,770	13,855	17,203	14,054	6,198	9,304	14,880	9,756	84,414	6,984	162,793
1929	80,147	15,314	23,934	17,459	5,796	9,333	14,863	10,899	75,499	8,341	166,122
1930	79,843	16,487	20,223	18,109	5,995	11,137	12,168	10,577	93,432	13,881	185,522
1931	71,160	17,843	13,332	18,063	6,419	11,544	11,685	7,991	114,469	14,502	198,005
1932	64,741	19,266	14,378	19,664	9,532	15,310	11,972	5,847	107,661	10,096	194,460
1933	69,459	22,481	18,267	21,950	8,057	18,758	17,348	10,586	68,704	14,744	278,467
1934	78,932	25,529	20,636	23,613	10,542	21,770	19,496	16,180	93,173	14,354	219,764
1935	91,212	46,484	26,390	30,483	8,517	41,662	18,957	15,053	91,304	16,641	324,225
1936	82,279	62,992	55,422	37,631	7,333	54,461	17,930	18,328	81,991	27,462	386,703
											445,829
											300,558

Sources: *Kantōkyoku tōkei sanjūnen shi* (Thirty years' statistics of the Kwantung Administration; Dairen, 1937).

Table 21

Index Number of Prices, 1906-1936

(1926 = 100)

1906	64.2
1907	56.5
1908	53.3
1909	54.8
1910	56.7
1911	58.2
1912	62.5
1913	59.9
1914	50.6
1915	59.1
1916	64.9
1917	82.0
1918	109.5
1919	131.6
1920	151.2
1921	108.4
1922	105.1
1923	105.1
1924	111.9
1925	114.7
1926	100.0
1927	94.6
1928	94.3
1929	92.0
1930	74.5
1931	60.1
1932	71.0
1933	80.7
1934	83.2
1935	88.4
1936	90.3

Sources: *Manshū sankō bukka tōkei* (A reference book for Manchurian price statistics; [place and date uncertain: R.W.H.]).

Table 22  
Value Added in Industrial Production at 1926 Prices  
In the Kwantung Leased Territory and South Manchuria Railway Zone  
1910 - 1936  
(in 1,000 Yen)

	Mining	Public Utilities	Manufacturing						TOTAL	Index Number (1926=100)			
			Food Beverage & Tobacco	Textile	Wood Products	Metal	Machinery	Ceramic	Vegetable Oil	Chemical	Subtotal		
1910	5,620	426	342	-	-	-	1,479	1,366	1,174	4,380	10,426	12.1	
1911	7,547	625	302	-	-	-	1,817	1,747	3,757	39	7,662	18.4	
1912	12,344	720	486	-	-	-	6,612	875	4,838	58	7,869	24.3	
1913	13,292	836	764	-	-	-	2,142	905	4,795	109	8,715	26.5	
1914	14,397	1,003	1,238	-	-	-	1,908	911	2,713	117	6,887	22.287	
1915	14,116	1,376	1,346	-	-	-	2,149	853	6,477	201	11,376	25.9	
1916	14,219	1,836	1,509	-	-	-	350	3,056	1,179	10,007	148	16,259	26.868
1917	16,518	2,522	1,701	2	-	-	360	4,463	1,351	15,802	1,100	25,169	32,314
1918	15,427	2,838	3,002	6	-	-	473	7,188	1,928	16,180	752	29,529	44,209
1919	18,473	3,542	3,045	12	-	-	398	7,155	2,524	17,342	803	47,794	51.4
1920	24,500	3,105	2,726	99	-	-	823	3,761	1,492	13,502	235	53,294	55.5
1921	19,896	3,443	2,838	986	-	-	1,106	4,068	1,430	16,051	350	22,638	58.2
1922	23,147	3,743	3,840	23	-	-	601	3,593	1,480	14,245	437	26,829	58.2
1923	36,096	4,250	6,400	853	-	-	774	3,246	1,843	18,854	827	34,543	58.2
1924	34,428	4,765	5,905	697	-	-	1,746	904	3,327	2,764	851	33,014	58.2
1925	37,640	5,771	8,896	2,003	-	-	1,116	3,117	2,234	14,208	915	33,135	58.2
1926	40,193	6,619	5,588	3,115	-	-	978	1,626	3,997	4,103	18,476	1,375	72,207
1927	49,921	7,519	5,810	3,271	1,161	-	2,020	4,205	4,861	15,534	2,743	39,605	86,070
1928	48,678	8,517	5,592	3,498	1,259	-	2,316	5,208	4,545	12,662	3,045	97,045	100.0
1929	52,573	9,409	6,338	4,346	1,217	-	2,320	5,202	5,079	11,325	3,442	95,320	112.8
1930	51,976	10,115	5,414	4,916	1,288	-	2,768	4,259	4,988	14,015	5,649	33,025	110.7
1931	46,308	10,931	4,283	4,883	1,371	-	2,876	4,090	3,723	17,170	5,593	43,297	117.6
1932	42,152	11,581	5,245	5,156	2,019	-	3,815	4,190	2,709	16,149	3,330	43,989	122.4
1933	45,248	13,640	6,721	5,624	1,702	-	4,667	6,072	4,919	10,306	5,551	42,613	122.4
1934	51,384	15,473	8,000	6,000	2,180	-	5,418	6,824	7,521	13,976	5,607	55,526	122.383
1935	59,466	28,127	9,350	7,830	1,790	-	9,953	6,634	7,041	13,696	7,008	63,302	142.2
1936	53,610	37,973	19,199	9,970	1,743	-	12,805	6,276	8,818	12,299	11,813	82,923	175.3

Sources: [Sources not located: R.W.H.]

the results must of course be treated with considerable caution, and the remaining calculations in this chapter will be based on gross value (Table 20), not value added (Table 22).

The next question to be considered is this: how much of Manchuria's industrial output was produced outside the Japanese areas and is therefore not covered by Table 20? The industrial census for 1934 revealed that, for all manufacturing establishments employing five or more persons, Kwantung and the SMR zone contributed 63.5 per cent of all output, by value, with the enterprises in Manchukuo supplying the other 36.5 per cent.<sup>54</sup> If mining and utilities are added, the Manchukuo share decreases somewhat, since these sectors were heavily concentrated in Kwantung. Nevertheless, it seems clear that Table 20 seriously understates Manchuria's total output. Outside Kwantung and the SMR zone, there were only two important industrial centers: Mukden and Harbin. Mukden was closely bound up with the economy of Kwantung and the railroad zone, and presumably experienced a similar pattern of growth. Harbin, however, was quite different. Data for this region are sparse but not entirely wanting. Specifically, I have found four series that cover the necessary time span: soybean oil, soybean cake, wheat flour, and coal. Since wheat milling and soybean processing were far and away the most important industries in Harbin,<sup>55</sup> these four series together probably give a fairly accurate picture of North Manchuria's industrial development (see Table 23). Since price data for North Manchuria were unavailable, Table 23 is calculated on the basis of 1926 prices in Kwantung.

The last step is now to combine the aggregate data for the south (Table 20) and the north (Table 23), which is done in Table 24. This completes the calculations for the period before 1936.

In 1937 the geographical scope of the Kwantung statistics was reduced, because the SMR zone was transferred to Manchukuo's jurisdiction. Also, the Kwantung authorities began to withhold many output figures for security reasons. These factors make it difficult to apply the methodology of the preceding pages to the period after 1936. Fortunately this is unnecessary,

Table 23

Gross Value of Industrial Production in North Manchuria at 1926 Prices  
and the Index Numbers of the Same  
1911 - 1936  
(Value in 1,000 Yen)

Year	Gross Value of Production				Index Number (1926 = 100)
	Bean Cake	Bean Oil	Wheat Flour	Coal	
1911	1,286	527	11,902	839	14,554
1912	1,072	439	7,688	961	10,160
1913	1,487	608	6,561	1,418	10,074
1914	2,162	885	10,403	1,446	14,896
1915	5,582	2,285	9,092	1,796	18,755
1916	5,914	2,421	9,481	2,012	19,828
1917	10,079	4,126	14,840	2,080	31,125
1918	5,996	2,454	13,484	1,577	23,511
1919	8,062	3,300	18,750	2,230	32,342
1920	7,834	3,207	22,845	3,024	36,910
1921	11,329	4,638	21,463	2,275	39,705
1922	16,816	6,884	14,960	1,648	40,308
1923	24,105	9,868	15,466	1,643	51,082
1924	32,558	13,328	5,858	1,685	53,429
1925	29,693	12,155	12,487	1,928	56,263
1926	34,707	14,207	9,372	2,509	60,795
1927	40,776	16,692	25,989	5,190	88,647
1928	39,920	16,342	37,352	5,464	99,078
1929	39,293	16,085	33,781	6,155	95,314
1930	41,420	16,956	28,585	2,970	90,931
1931	44,286	18,129	24,039	5,177	91,631
1932	14,416	5,902	18,594	1,666	40,578
1933	16,621	6,804	22,210	4,293	49,928
1934	11,033	4,516	15,874	5,242	36,665
1935	12,521	5,125	23,758	5,275	46,679
1936	10,318	4,224	43,024	6,336	63,902

Sources: Source uncertain. Probably *North Manchuria and the Chinese Eastern Railway*, (Harbin, 1924); R.W.H.

Table 24

Gross Value of Industrial Production in South and North Manchuria  
at 1926 Prices and the Index Numbers of the Same  
1911 - 1936  
(Value in 1,000 Yen)

	South Manchuria	North Manchuria	Total	Index Number (1926 = 100)
1911	48,048	14,554	62,602	19.4
1912	61,587	10,160	71,747	22.2
1913	66,115	10,074	76,189	23.6
1914	56,930	14,896	71,826	22.2
1915	84,494	18,755	103,249	32.0
1916	112,695	19,828	132,523	41.0
1917	164,566	31,125	195,691	60.6
1918	175,983	23,511	199,494	61.8
1919	190,994	32,342	223,336	69.2
1920	162,232	36,910	199,142	61.7
1921	179,339	39,705	219,044	67.8
1922	171,799	40,308	212,107	65.7
1923	243,588	51,082	294,670	91.2
1924	227,260	53,429	280,689	86.9
1925	219,190	56,263	275,453	85.3
1926	262,131	60,795	322,926	100.0
1927	271,981	88,647	360,828	111.7
1928	251,418	99,078	350,496	108.5
1929	261,583	95,314	356,897	110.5
1930	281,852	90,931	372,783	115.4
1931	287,008	91,631	378,639	117.3
1932	278,467	40,578	319,045	98.8
1933	270,314	49,928	320,242	99.2
1934	324,225	36,665	360,890	111.8
1935	386,703	46,679	433,382	134.2
1936	445,829	63,902	509,731	157.8

Sources: Based on Tables 20 and 23.

for the SMR staff compiled an index of industrial production for the years 1937 to 1942 that covered all of Manchuria (see Table 25). The index included 44 commodities, many of them the same as those in *Kantōkyoku tōkei sanjūnen shi* data, although the SMR index is weighted more heavily with producers' goods.

The final problem is how to relate the two indices, since they have no years in common. This was done by using yet another index of production, covering the period 1934 to 1939, that was published by the Hsinking office of the SMR. According to that index, if output in 1936 is taken as 100, output in 1938 was 131.7.<sup>56</sup> This information was used to link the indices of Table 24 and Table 25, thereby yielding the final result: an index of industrial production for all Manchuria running continuously from 1911 to 1942. This index is given in Table 26.

Table 25

Index Number of Industrial Production in Manchuria  
 1937 - June 1942  
 Based on Gross Value of Production at 1937 Prices

	All Goods	Producers' Goods	Consumers' Goods
1937	100.0	100.0	100.0
1938	116.2	119.1	101.5
1939	126.9	133.1	95.7
1940	134.2	143.4	88.1
1941	155.1	168.3	90.1
1942 (1st half year)*	164.0	173.9	104.3

\* Preliminary pending the availability of data on  
 quantity of electricity consumed.

Source: *Manshū keizai tōkei kihō* (Quarterly bulletin  
 of Manchurian economic statistics), No. 3:33.

Table 26

Index Numbers of Industrial Production in Manchuria  
1911 - 1942

(1926 = 100)

1911	19.4
1912	22.2
1913	23.6
1914	22.2
1915	32.0
1916	41.0
1917	60.6
1918	61.8
1919	69.2
1920	61.7
1921	67.8
1922	65.7
1923	91.2
1924	86.9
1925	85.3
1926	100.0
1927	111.7
1928	108.5
1929	110.5
1930	115.4
1931	117.3
1932	98.8
1933	99.2
1934	111.8
1935	134.2
1936	157.8
1937	178.8
1938	207.8
1939	226.9
1940	239.9
1941	277.3
1942 (half year)	293.2

## APPENDIX

### *Equivalent Weights and Measures*

#### *Area*

1 cho = 0.992 hectares

1 hectare = 2.471 acres

1 mow (mou) = about 1/6 of an acre

1 t'ien-t'i = 0.6 hectares

1 shang = 0.737 hectares

1 tan = 0.099 hectares

#### *Distance*

1 li = about 1/3 of a mile

#### *Weight*

1 koku = 2.25 piculs

1 picul (tan) = 100 kin = 132 pounds

1 kin (catty) = 1.32 pounds

1 shih = about 1 picul

## NOTES

*I. The Historical Setting*

1. Hsiao I-shan, *Ch'ing-tai t'ung-shih* (A comprehensive history of the Ch'ing era; Shanghai, 1928), IV, 1650-1651.
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3. Hsiao I-shan.
4. Source not located: R.W.H.
5. H.L.M. James, *The Long White Mountain* (London, 1888), p. 98.
6. Waller Wynne, *The Population of Manchuria* (Washington, D.C., 1958), p. 16.
7. James, p. 47.
8. Wang Ch'ing-yün, *Hsi-Ch'ien chi-cheng* (Records of government in the K'ang-hsi and Ch'ien-lung periods; 1890), 4:49.
9. Wang Ch'ing-yün, 4:50.
10. *Ta-Ch'ing hui-tien shih-li* (Cases and precedents of the collected statutes of the Ch'ing Dynasty; 1886), *chüan* 167.
11. *Kao-tsung shun-huang-ti sheng-hsün* (Sacred instructions of the Ch'ien-lung Emperor), *chüan* 76.
12. Ho Ch'ang-ling, *Huang-ch'ao ching-shih wen-pien* (Essays on statecraft of the Imperial [Ch'ing] Dynasty; 1886), *chüan* 35.
13. Ho Ch'ang-ling, 35:3.
14. Hsiao I-shan, IV, 1642.
15. *Chi-lin t'ung-chih* (A comprehensive gazeteer of Kirin; 1891), *chüan* 1.
16. *Ibid.*, *chüan* 2.
17. *Ibid.*, 2:15.

18. *Ibid.*, 2:22.
19. *Ibid.*, *chüan* 3.
20. *Ibid.*, *chüan* 31.
21. Hsiao I-shan, IV, 1672.
22. *Hei-lung-chiang chih kao* (A draft gazeteer of Heilungkiang; 1933), 8:12-14.
23. *Chi-lin t'ung-chih*, *chüan* 29.
24. Mary Clabaugh Wright, *The Last Stand of Chinese Conservatism* (Stanford, 1957), p. 152.
25. Hsiao I-shan, IV, 1672.
26. Hsiao I-shan, IV, 1680-1681.
27. There are many similar accounts of the events of this period. My version is based mainly on H.L.M. James.
28. David J. Dallin, *The Rise of Russia in Asia*, (New Haven, 1949), p. 23.
29. James, p. 98.
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 Chang Shang-hsien 張尚賢  
 Chang Tso-lin 張作霖  
 Cheng Ch'eng-kung (Koxinga) 鄭成功  
 ch'i-jen 旗人  
 Chia-mu-ssu 佳木斯  
 Chin-chou 金州  
 chin-hai 禁海  
 Chingshun 景淳  
 ch'ing-ma 青麻  
 chō 町  
 ch'ü-jen 取任  
 ch'uan 串  
  
 Dairen 大連  
  
 fen 分  
 Fengtien 奉天  
 Fu-chün 富俊  
 Fushun 撫順

Han-chün 漢軍  
 Ho-kang 鶴崗  
 hsien ta-yang 現大洋  
 huang-wu tsung-chü 荒務總局  
 Huo Pei 霍備  
  
 I-chou 義州  
 Inaba Iwakichi 稲葉岩吉  
  
 Jalangga 查良阿  
 Juilin 瑞麟  
  
 kaitaku sōkyoku 開拓總局  
 Kamijima Keitoku 上島慶篤  
 kaoliang 高粱  
 Kawamoto Daisaku 河本大作  
 k'en-wu tsung-chü 墾務總局  
 kin 斤  
 Kirin 吉林  
 koku 石  
 K'o-shan 克山  
 kuan-li ch'i-wu ta-ch'en  
 管理旗務大臣  
 Kungchuling 公主嶺  
 Kuroda Kiyotaka 黑田清隆  
  
 Larin 拉林

*li* 里

Liang Shih-cheng 梁詩正

Liaotung 遼東

Manchukuo 滿洲國

*mou* (mow) 畝

Mu-leng 穆棱

Newchwang 牛莊

pao-ching an-min 保境安民

Penshihu 本溪湖

Petuna 伯都訥

P'u-yi 滿儀

Sai-ch'ung-a 賽沖阿

*shang* 向

*shih* 石

*shih-lang* 侍郎

Shuang-ch'eng-p'u! 雙城鋪

*ta-hsueh-shih* 大學士

*tael* 兩

*tai-ti t'ou-ch'ung* 帶地投充

Takebe Rokuzō 武部六藏

*tan* (area) 反

*tan* (weight) 擔

Terpuchin 特普欽

T'iehling 鐵嶺

Wu San-kuei 吳三桂

Yamamoto Jōtarō 山本条太郎

Ying-k'ou (Newchwang) 營口



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