THE AGRICULTURAL DEVELOPMENT OF SIBERIA, 1890-1917

by

DANIEL RAPHAEL KAZMER

B.S., University of Illinois at Chicago Circle

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Signature of Author. .....

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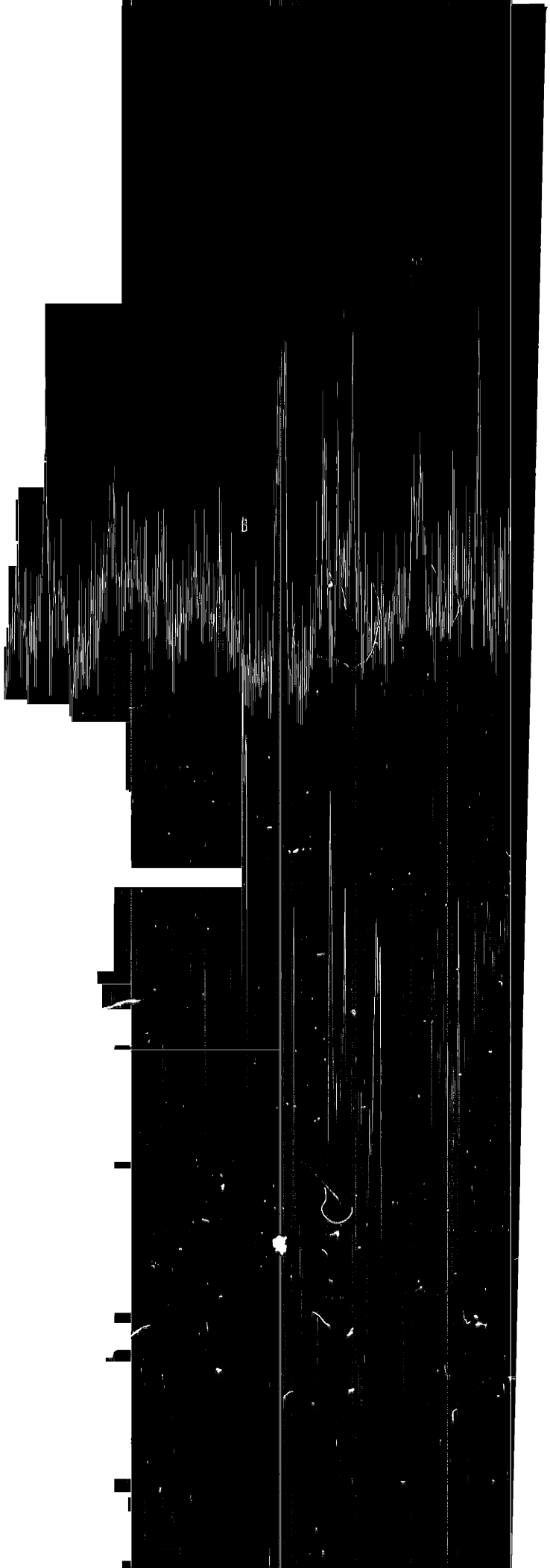
Certified by. .....

Thesis Supervisor

Accepted by.....

Chairman, Departmental Committee

on Graduate Students



The Agricultural Development
Daniel Raphael Kazmer
Submitted to the Department
partial fulfillment of the r
Doctor of Philosophy.

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largely ineffective. These included regulations concerning migration and settlement, government loans and exemptions from the draft and taxes, the immigrant land fund, and technical assistance. Government efforts to open up Siberia to the import of modern agricultural machinery was quite beneficial. Only two government policies were harmful to Siberian agriculture: the requisition of some peasant land for the immigrant land fund and the institution of discriminatory railroad rates to impede the export of Siberian grain to European Russia.

The peasant role in Siberian agricultural development, with the exception of railroad construction, was much more important than the government role. The Siberian peasants were not only competent as independent farmers. They also combined into producer cooperatives to exploit economies of scale, notably in butter-making. They even instituted and maintained their own land tenure system, allocated their own direct tax burden, and performed other functions usually associated with government.

Thesis Supervisor: Evsey D. Domar

Title: Ford Professor of Economics

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Biographical Note

Daniel Raphael Kazmer was born in Chicago, Illinois on February 10, 1947. He attended the University of Illinois at Chicago Circle from June, 1965 to June, 1969 and received a Bachelor of Science Degree with highest academic honors from that institution in June, 1969. Having received both a Danforth Graduate Fellowship and a National Science Foundation Graduate Fellowship, he attended M.I.T. from September, 1969 to September, 1973 and received a Ph.D. in economics from M.I.T. in September, 1973.

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Chapter I: Introduction and Glossary

A. Introduction

There are a number of reasons for my and, I hope, the reader's interest in such an obscure topic as the agricultural development of Siberia. The first reason is that the economic development of Siberia has been, I feel, an unjustly neglected topic. Siberia occupies over half the land area of one of the most powerful nations on the face of the globe. Yet, in most studies of the economic history of either the Russian Empire or the Soviet Union, only cursory attention, if any, is given to Siberia. This neglect might be considered similar to studying the economic development of the United States but omitting the area between the Mississippi River and the Rocky Mountains. A second reason for interest in this topic is that Siberia is just now being re-discovered economically but this time as a source of oil, natural gas, timber, and other natural resources. Interest in the area's natural resource productivity will probably be followed by interest in its other economic potentials, and the agricultural productivity of the region is a matter of historical record as will be indicated in Chapter III below. A third reason justifying interest in this topic is that it will provide a basis for later comparative economic historical studies. While Canadian and American settlers went west to homestead on the frontier, the peasantry of European Russia went east to do the same. The similarities

between the two movements is uncanny. Both the frontiers in North America and in Siberia were first opened by explorers followed by soldiers, trappers, miners, and traders. The railroads in both North America and Siberia were of vital importance in opening the frontier to agriculture. Further study will undoubtedly uncover more similarities. Also of interest will be comparative studies of peasant economic life before the Revolution in European Russia and Siberia. The peasantry of European Russia were weighed down with government bureaucracy, the landed gentry, and the remnants of a serf tradition since they remained serfs as late as 1861. The Siberian peasant, on the other hand, had never known serfdom or a landed gentry in Siberia and government control or interference was difficult in the vast expanses of the region. Thus, Siberia provides a laboratory where we can see what the Russian peasant could accomplish on his own initiative with a minimum of interference. Also of interest would be comparative studies of Siberian economic development before and after the Revolution. It is hoped that this work will provide a basis for a number of such comparative studies.

The reason for the choice of this particular time period and this particular stage in Siberian development is quite simple. The first major phase of Siberian economic development was the agricultural expansion which accompanied the coming of the railroad. Construction on the Trans-

Siberian Railway was begun in 1891 and the most important segment connecting Western Siberia with European Russia was completed in 1896. This agricultural expansion continued until it was interrupted by war and revolution. Thus, the limits of the period chosen for study are reasonable ones.

The central concern of this thesis is to unravel the complex factors which determined the nature and extent of Siberian agricultural development. Chapter II will provide some general background information about Siberian geography and history. Chapter III will present the "bare facts" of the development of Siberian agriculture from 1890 to 1917 including both inputs and outputs. Chapter IV discusses the determinants and causes of that development and their division into four categories: exogenous non-human factors; exogenous human factors; government actions and policies; and market-related human factors. Chapters V through IX then discuss these factors and their effects on Siberian agriculture. Chapter X presents a final answer to the central question of this thesis: Was the agricultural growth of Siberia largely the result of government policies and development efforts or was it the product of peasant response to the incentives of the marketplace?

B. Glossary

As an aid to the reader, the following glossary is included. All special or foreign terms are defined the first time they appear in the text; nevertheless, the browser may find the following short list helpful. The Library of Congress transliteration system is used throughout this work.

artel': an association for common work.

desiatina: a measure of land equal to 2.7 acres.

gubernia: a province or governing district with its own civil administration.

Kabinet: the Tsar's household. Some lands in Siberia were designated Kabinet lands similarly to Crown lands in other countries.

khutor: a peasant-owned farm in which all land was held in one contiguous piece and the home was on that land rather than in the village.

kopek (strict transliteration kopeika): a monetary unit. There are 100 kopeks in a ruble.

kulak: a rich peasant. In Marxists terms, a rich peasant who exploited other peasants to obtain the surplus value of their labor.

mir: peasant community organization usually covering a single village.

new-settler: a peasant who migrated to Siberia after the opening of rail service in 1896.

oblast': a province or district without its own civil administration.

obrok article: a paper conferring the right to use a parcel of government land for a limited period; a rental permit for government land.

obrok tax: a tax collected from the peasantry for the Treasury of the central government.

okrug: a region or district surrounding a city or town.

old-settler: a peasant who arrived in Siberia before the opening of the railroad in 1896.

pood: a measure of weight equal to 36.113 pounds.

ruble: a monetary unit containing 100 kopeks and roughly equivalent in value to $0.515 at the turn of the century.

taiga: dense coniferous forest between tundra and steppe regions.

uezd: an administrative district roughly analogous to a county and belonging to a gubernia or oblast.

verst: a measure of distance equivalent to 0.6629 miles.

volost': a rural administrative district smaller than an uezd and containing one or more villages.

II. What Is Siberia?

To most people, Siberia is a remote and desolate corner of Russia suitable only as a location for prisons and concentration camps. Its climate makes most human productive activity and life itself impossible except for a few hardy Eskimo-like natives. The land is barren, unyielding, and usually frozen. Those with some background in Russian studies also know of Siberia as a producer of furs and gold and, quite recently, as a potential future exporter of oil and natural gas to the United States and Japan. At best, it might be said that Siberia lies dormant and undeveloped; at worst, the region may be written off as economically hopeless. These preconceptions and others like them are absolutely wrong, however. The following pages will chronicle the first stage of Siberia's modern economic development--the growth of agriculture from 1890 to 1917--and in this way serve to eliminate many of the misconceptions noted above. Before we proceed, however, it is necessary to discuss briefly the geography and history of Siberia to put the region in proper perspective for the reader.

A. The Geography of Siberia

If one looks at a map of the Russian Empire at the turn of the century, Siberia will be seen to occupy the eastern part of the country. Siberia stretches some 4,000 miles west to east from the Ural Mountains to the

Pacific Ocean and north to south some 1,800 miles from the Artic Ocean to the borders of Central Asia and China. The total area of Siberia is 5,330,896 square miles; this is over a quarter of the total land mass of the continent of Asia and more than 60% of the total land area of the Soviet Union. By contrast, the total land area of the United States (all fifty states plus the District of Columbia) is only 3,615,211 square miles. Thus, the total land area of the United States is only 68% of that of Siberia.

Geographically, the huge area of Siberia can be divided into three parts. Western Siberia, between the Ural Mountains and the Yenisey River, was composed of Tomsk and Tobolsk gubernias (governing districts). Eastern Siberia, from the Yenisey to the mountain ranges near the Pacific Coast, was composed of Yeniseysk and Irkutsk gubernias and Yakutsk and Zabaikal oblast's (another governing district). And the Russian Far East, which occupies the Pacific Coast, was composed of Kamchatka, Primorskaia, and Amur oblast's and Sakhalin Island. Akmolinsk and Semipalatinsk oblast's were part of Central Asia, but their proximity to Western Siberia makes them relevant to an understanding of the economy of the region.

Western Siberia consists mostly of a great lowland plain stretching from the steppes of Kazakhstan to the Artic Ocean and corresponds roughly to the drainage basin of the Ob River, which rises in the Altai Mountains in the

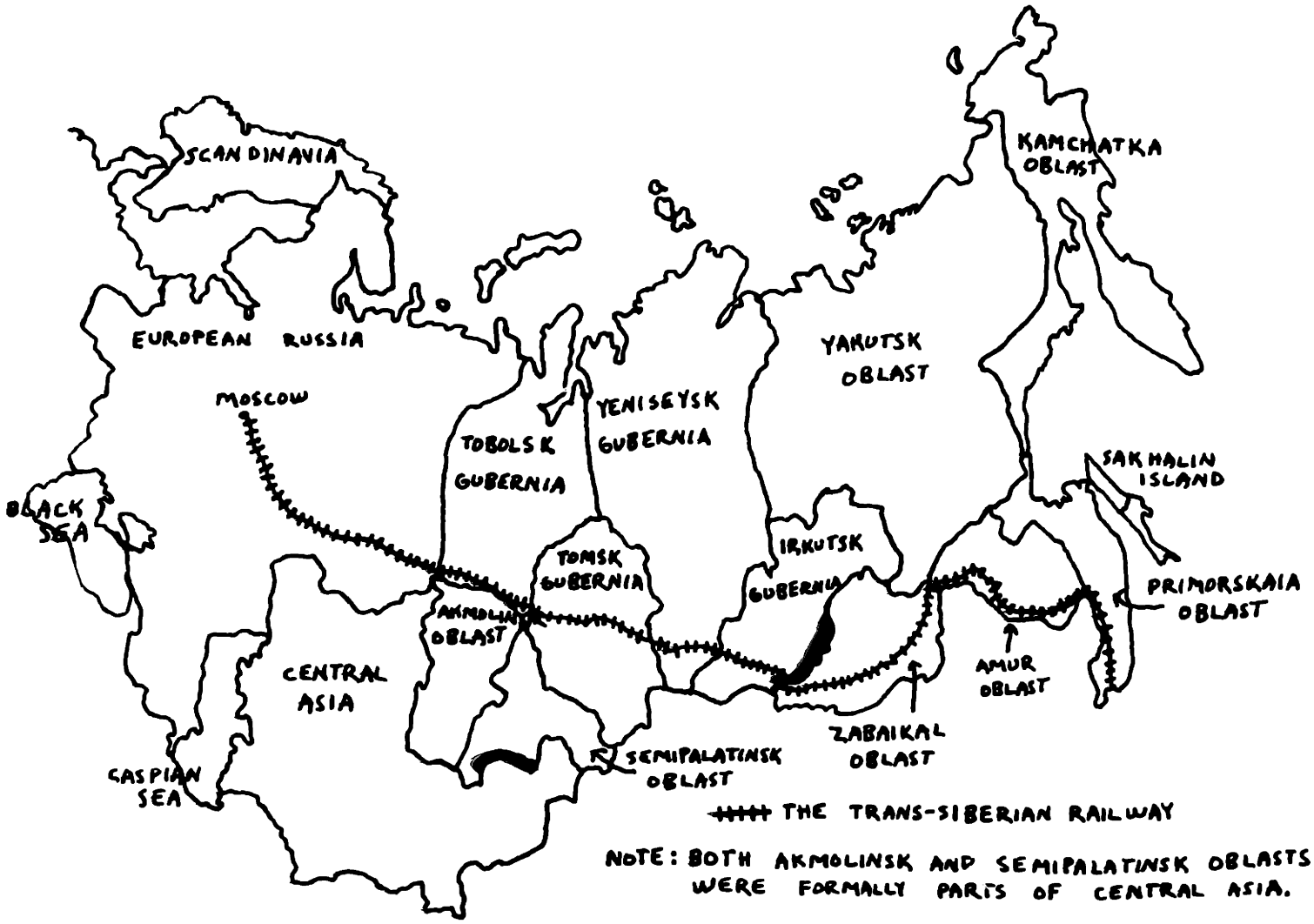

FIGURE II.1: ADMINISTRATIVE UNITS OF SIBERIA IN 1914

south and flows northward to empty into the Arctic Ocean. Unlike the great rolling plains of Eurpean Russia which rise to 1,000 feet above sea level as they approach the Ural Mountains, the West Siberian lowland is almost level. The city of Omsk, 1,000 miles from the Arctic Ocean, is only 270 feet above sea level.

The climate of Western Siberia may briefly be described as similar to that of areas of European Russia lying at the same latitude except that winters are much colder in Western Siberia. And since the topography of Western Siberia is so uniform, it is largely climate that determines vegetation zones--of which there are three in Western Siberia. Along the Arctic Ocean in the north, there is a narrow tundra zone which can support only moss and lichens. South of the tundra is the taiga, or forest region, which covers roughly two thirds of Western Siberia. Inspite of moderate rainfall, poor drainage leaves this region a huge bog in summer. South of the taiga lies the Western Siberian wooded steppe, the black soil of which makes it the most agriculturally productive region of Siberia. This wooded steppe region is, for purposes of studying agricultural development, the only part of Western Siberia of significance.

Eastern Siberia, which measures about 1,800 miles across from Western Siberia to the Russian Far East and 1,500 miles from north to south, corresponds roughly to the drainage basins of the Yenisey and Lena Rivers. It is topographically almost an exact opposite to Western Siberia. It has a general

upland relief with over 75% of its total area occupied by plateaus and mountains. Lowlands in Eastern Siberia are found in only three places: along the easterly bank of the Yenisey River; in the basins of the Lena and Vilyui Rivers; and along the Arctic coast.

The climate in Eastern Siberia is much more severe than in Western Siberia, which enjoys both higher temperatures and greater precipitation. The southern limit of permafrost in Western Siberia lies along the Arctic coast leaving most of that region free of permanently frozen subsoil. In contrast, almost all of Eastern Siberia lies under permafrost. This factor, added to the absence of a continuous steppe belt in Eastern Siberia, goes a long way toward explaining the failure of the region to develop agriculturally in comparison to Western Siberia.

The Russian Far East extends along the coast of the Pacific Ocean between Korea and the Bering Strait. It occupies an area of roughly 1,200,000 square miles or one third the area of the United States. It is a mountainous area with its climate highly variable and affected by both the winter monsoon from Eastern Siberia and the summer monsoon from the sea. North of the mouth of the Amur River, the growing season is only three months or less. This factor, combined with the mountainous terrain, makes normal agricultural activity impossible except for a few lowland areas in the south. Most of the area is, however, heavily forested and rich in furbearing animals.

In conclusion then, both soil and climatic conditions dictate that the potentially most agriculturally productive regions of Siberia are the wooded steppe in the south of Western Siberia, scattered regions in the extreme south of Eastern Siberia, and a few places huddled along the Amur River in the Russian Far East. We shall find further in the following pages that Siberian agriculture was largely Western Siberian agriculture.

B. Historical Sketch[1]

The earliest settlers in Siberia were native tribes who occupied the great forests of Siberia while warlike horsemen roamed the steppes of Central Asia to the south. Southern Siberia came under the rule of Genghis Khan and his successors in the thirteenth century. Later, the Golden Horde, a successor of the Mongol Empire, assumed control of Western Siberia while the Yuan dynasty of China under Kublai Khan claimed Eastern Siberia and the Far East.

Siberia first appeared in Russian history in the twelfth century when Novgorod merchants crossed the northern Urals to trade with the tribes along the Ob River--mostly for furs. The military conquest of Siberia did not begin until 1581, however. In that year a small Cossack band under the command of Yermak Timofeevich, a mercenary in the employ of the Stroganovs (a powerful merchant family with considerable properties in the western Urals), crossed into Siberia and conquered the Tartar khanate of Sibir. Thus, Sibir, a fortress town near what is now Tobolsk, gave its name to the entire region. This opened the door to further inroads by Cossack bands which moved quickly along Siberia's river systems and constructed wooden forts at strategic points. Tiumen was founded in 1585; Tobolsk in 1587; Tomsk

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[1]For a more detailed account, see Yuri Semyonov, Siberia: Its Conquest and Development, translated by J.R. Foster. (Boston, 1963).

in 1604; Kuznetsk in 1617; Krasnoyarsk in 1628; Yakutsk in 1632; Okhotsk in 1649; Albazin (on the Amur River) in 1651; and Irkutsk in 1652. Russian expansion was not seriously interrupted until 1689, when the Treaty of Nerchinsk ceded the lands along the Amur River to China. These lands were recovered from China in 1858 and 1860 under the Aigun and Peking treaties. Territorial gains and losses after 1860 were relatively minor and of no significance for Siberian agricultural development.

At first, Russian economic activity was largely confined to collection of the fur tribute from the natives. However, in the late sixteenth and all of the seventeenth centuries, small-scale Russian agricultural colonization followed on the heels of military occupation. Soldiers and administrators could not depend on food shipments from European Russia from which they were separated by thousands of miles and a number of potentially hostile tribes. Large numbers of Russians were also employed in maintaining an extensive network of stagecoach and mail routes.

Besides furs, farming, and transport, the only industry to achieve significance in Siberia before 1890 was mining. Silver mining began on a small scale in 1698 and in the eighteenth century, two important industrial areas emerged: in the Altai (roughly the southern third of Tomsk gubernia or governing district), where silver and copper were mined and smelted; and in the Nerchinsk area east of Lake Baikal

where silver and lead were produced. Mining replaced fur trading and trapping as the main economic activity in Siberia. Most of these mines and smelting plants were run either by the State or by the Kabinet (the Imperial household). Labor was supplied by workers in permanent bondage to the mines and metal plants. Convict laborers were also used but they too often escaped to become bandits and then lived by preying on their former captors. In contrast, gold mining, which was not well-developed until the 1830's, was largely privately-owned and depended on free workers for its labor force.

Two policies of the Russian government were of special importance in their effects on the Siberian social structure: one was the use of Siberia as a penal and exile colony and the other was the treatment of Siberian native tribes. Convicts had been sentenced to serve terms in Siberia as early as the eighteenth century, but the practice of exiling political undesirables to Siberia did not gain momentum until after the Decembrist Revolt in 1825. The Decembrists were joined by Polish insurrectionists in 1830 and 1831, and the precedent of exile to Siberia for political crimes was set. Most political exiles were not merely sent to Siberia, but were located in specific districts and banned from even visiting the relatively hospitable areas of Western Siberia. The major places of exile were Nerchinsk and Sretensk in the Chita area (just east of Lake Baikal), Yakutsk and Vilyuisk

(north and northeast of Lake Baikal), Krasnoyarsk (on the Yenisey River just east of Tomsk), and Turukhansk (where the Yenisey crosses the Arctic Circle). As the amenities of civilization spread across Siberia, Krasnoyarsk became the only relatively bearable place of exile. Despite government attempts to isolate them, the intelligence and energy of the political exiles pushed them to the forefront of Siberian intellectual life. They studied the climate, geography, flora, and fauna of their new homeland, taught school, and combined with the indigenous small industrialists of Siberia to form the backbone of the Siberian intelligentsia, which never ceased its demands for more regional self-government and an end to colonial status. Unlike so many frontier areas in history which initially attracted only the dregs of society, Siberia was supplied by the exile system with some of the best minds and hearts Russia had to offer.

Before 1890, the Imperial government's policy toward the native tribes of Siberia was largely one of "benign neglect." True, the natives were required to pay a fur tribute but otherwise they were largely left alone. As a result, the native tribes of Siberia may be divided into two groups: those which succumbed to exploitation, poverty, and disease, and those--like the Yakuts, Buryats, and Kazakhs--which adapted to their new situation and prospered. This policy or lack of it toward the natives did not change

until the 1890's when lands used by native herdsmen were needed for the immigrant land fund.

The modern period in Siberian economic development was ushered in with the construction of the Trans-Siberian Railway. The original line was begun at both ends at Cheliabinsk and Vladivostok in 1891. The part of the line most important for agriculture linked Western Siberia with European Russia and was completed in 1896. The remainder of the line was not fully completed until 1905. The Trans-Siberian Railroad facilitated colonization, connected Siberia with markets and suppliers in European Russia, and fostered supporting industries. Coal mines developed along its route to feed its engines and the first Siberian engineering plants were railroad repair shops. This brings us up to the agricultural development of Siberia and to the main body of this work.

III. The "Bare Facts" of Siberian Agricultural Development Before the Revolution

A. The Products of Siberian Agriculture

Up to about 1890, the economy of Siberia had been largely an economy of furs and mining. With the coming of the Trans-Siberian Railway, however, Siberian economic development meant agricultural development. The process of agricultural development reached its peak in 1913, the year preceding World War I. The relative importance of agriculture in the Siberian economy is indicated by its important role in the total exports of Siberia.

Table III.1: Siberian Exports to Russia and Abroad by Value in 1913[1]

Commodity	Value in Millions of Rubles	Share of Total Exports
butter	60	40.9%
gold	28	19.5%
furs	24	15.6%
wheat	21.4	14.6%
meat	10.5	7%
fish	4.1	2.4%
Total	148	100%
butter+wheat+meat	91.9	62.5%

[1] Osobennosti Agrarnogo Stroia Rossii v Period Imperializma (Peculiarities of the Agrarian Structure of Russia in the Period of Imperialism), (Moscow, 1962), p. 175

As the figures in Table III.1 suggest, the agricultural development of Siberia was based largely on three outputs: butter, wheat, and meat. The growth in the output of all three of these commodities after the completion of the Western Siberian section of the Trans-Siberian Railway in 1896 was little short of phenomenal as the figures in the following paragraphs indicate.

Butter

The history of the Siberian butter industry was one of continual growth. Old-settlers (those in Siberia before 1890) had produced boiled butter (Before the invention of the mechanical separator, the production of home-made butter involved boiling to separate butter from the rest of the raw milk.) for their consumption for as long as they had been in Siberia. Siberian boiled butter first appeared in the markets of European Russia in the early 1800's. Later, it was exported to Europe, especially Germany, and Turkey. Between 1858 and 1868, the average annual export of Siberian butter was 1,589 tones. By 1895, Siberia was exporting between 5,417 and 6,320 tons of boiled butter annually of which 40% went to Turkey[2].

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[2] L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX (The Siberian Peasantry on the Edge of Two Centuries: The End of the 19th-The Beginning of the 20th), (Novosibirsk, 1967), p. 75, 157.

It was, however, only with the widespread use of the mechanical separator and introduction of rail transport that Siberian butter exports achieved their remarkable growth which was finally interrupted by World War I as the following table indicates.

Table III.2: Exports of Siberian Butter to Foreign Countries[3] by Years

Years	Weight in Tons	Percentage Increase Over Previous Year
1894	7.2	-
1895	90.0	1,150%
1896	486.0	440%
1897	864.0	78%
1898	2,880.0	233%
1899	5,580.0	94%
1900	18,900.0	239%
1901	21,631.2	14%
1902	28,979.6	34%
1903	31,435.4	8%
1904	36,059.7	15%
1905	36,704.2	2%
1906	53,526.8	46%
1907	61,445.5	15%

(continued)

[3] Aziatskaia Rossiia, Vol. I: Liudi i Poriadki za Uralom (Asiatic Russia, Vol. I: Peoples and Customs Beyond the Urals), (Petersburg, 1914), p. 332; V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria (The Siberian Village on the Eve of October), Novosibirsk, 1966), p. 365, 378; Goriushkin, p. 162.

Years	Weight in Tons	Percentage Increase Over Previous Year
1908	59,584.5	-3%
1909	60,377.4	1%
1910	70,513.2	17%
1911	78,541.2	11%
1912	80,278.2	2%
1913	102,060.0	27%
1914	59,166.0*	-42%
1915	83,034.0*	40%
1916	57,150.0*	-31%
1917	63,378.0*	11%
average 1896-1900	5,764.0	217%
average 1910-1905	30,962.4	15%
average 1906-1910	61,089.5	15%
average 1911-1913	86,959.8	13%
average 1896-1913	41,664.4	71%
average 1914-1917	65,682.0*	-6%

*Includes sales to the military.

The decline in the exports of Siberian butter to foreign countries after 1913 was much more precipitous than that indicated in the above table. The figures for 1914 through 1917 include sales to the military which increased markedly with mobilization for war. Yet, not even the demands of the army were sufficient to replace those of Siberia's foreign customers.

The Siberian butter industry was predominantly an export industry. Roughly 90% of the butter produced in Siberia

was exported. Of that which was exported, slightly less than 90% went to Western Europe through the Baltic ports; about 10% was marketed in European Russia and only 2% to 3% was sent to the Far East and Asia.[4] The value of butter exported from Siberia was twice the value of Siberian grain exports[5] and twice the value of Siberia's gold exports. (Siberia produced two thirds of all the gold mined in Russia between 1896 and 1913.)[6] Siberian butter was the fourth largest raw material export of all Russia (after grain, flax and timber). The value of exported Siberian butter alone was 1.5 times the value of all agricultural machinery and implements imported into Russia.[7]

Siberian butter was also of great importance on the world market. In the half-decade before World War I (1909-1913), Siberia produced 16% of the world's production of butter and 61.3% of all the butter produced in the Russian Empire.[8] Denmark had been the world's leading butter exporter over the turn of the century, but Siberia had been running a close second. Finally in 1913, Siberia achieved first place as the world's leading exporter of butter--if we in-

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[4]Tiukavkin, p. 365.

[5]Goriushkin, p. 163.

[6]Tiukavkin, p. 366.

[7]D.W. Treadgold, The Great Siberian Migration, (Princeton, 1957), p. 318.

[8]Osobennosti Agrarnogo Stroia Rossii v Period Imperializma, p. 173.

clude exports to European Russia. In that year, Denmark exported 100,340 tons of butter and imported from Russia 12,278 tons of Siberian butter. But in 1913 Siberia exported a total of 108,339 tons of butter to European Russia and to foreign countries. Its main foreign customers were England (40% of butter consumed in England in the years before World War I was of Russian origin) and Germany.[9]

Grain

The appearance of grain culture in Siberia was a relatively recent phenomenon. The first Russian soldiers to occupy Siberia depended on grain shipments from European Russia for their sustinence. (In the year of the first census, 1662, there were counted only 3,000 male Russians in all of Siberia.) Russian monasteries in Tobolsk and Tomsk gubernias were instrumental in the introduction of grain culture into the Siberian frontier. By 1762, Siberia was able to feed itself with its own wheat. Before the coming of the Russians, German wheat or spelt[10] had been under primitive cultivation by the Tartar and Chuvash tribes among others. Spelt grain is of poorer quality than wheat grain but groats can be made from it. The Russians called spelt

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[9] Tiukavkin, p. 367-368.

[10] A wheat, Triticum spelta, native to southern Europe and Western Asia, used chiefly for livestock feed.

"Tartar grain."[11] The cultivation of wheat and other grains generally spread north and east from the southwestern areas of Siberia. By the second half of the nineteenth century, the basic field crops of Siberia were spring wheat, oats, winter rye, spring rye, barley, buckwheat, millet, peas, potatoes, hemp, and flax. Cucumbers, cabbage, carrots, onions and so forth were garden crops intended for local use and for sale to cities, gold mines, and the North.[12] By 1913, Tobolsk, Tomsk, and Yeniseysk gubernias were important wheat-growing and exporting regions.[13] Poorer soil led Zabaikal oblast' to produce more spring rye than either wheat or oats.[14] The oblast's of the Far East (Amur and Primorsky) produced little grain, but what little they did produce was largely wheat.[15]

Harvests were highly variable due to variations in the weather and there appears to have been a general trend over time for bad years to come closer together. As less fertile

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[11] Aziatskaia Rossiia, Vol. I, p. 256-257; E.E. Geshele, Ocherki Razvitiia Sibirskogo Zemledeliia (Essays on the Development of Siberian Agriculture), (Omsk, 1957), p. 63.

[12] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III: Sibir'v Epokhu Kapitalizma (History of Siberia from Ancient Times to Our Days, Vol. III: Siberia in the Epoch of Capitalism), (Leningrad, 1968-1969), p. 30.

[13] Aziatskaia Rossiia, Vol. I, p. 258.

[14] E.E. Geshele, p. 62.

[15] Aziatskaia Rossiia, Vol. I, p. 259.

parcels were pressed into service with Siberia's general agricultural expansion, the vagaries of the weather had greater effect on output per unit of area sown. Siberia suffered poor harvests in 1870, 1874, 1878-1879, 1883, 1891-1892, 1900-1902, 1909-1910, 1912, 1913, and 1916.[16]

Figures for Siberian grain production before 1900 are scattered and not very reliable unless they were derived from an intensive study of a particular locality. The growth in the output of field crops at 1906-1910 prices in Siberia may be compared with the growth in European Russia in the following table.

Table III.3: Indexes of Output of Field Crops in Siberia and European Russia[17] (1906-10=100)

Years	Siberia	European Russia
1901-1905	77	100
1906-1910	100	100
1911-1915	127	116

A summary of available data for major Siberian field crops, as well as comparable data for European Russia, is contained in Tables 4 through 10 in the Appendix to this chapter. These tables reflect the impressive growth of Siberian grain

[16]Goriushkin, p. 294; Osobennosti Agrarnogo Stroia Rossii v Period Imperializma, p. 169.

[17]Based on Tables 4 through 14 in the Appendix.

production. The basic field crops in Siberia were spring wheat and oats with winter rye a distant third. These two crops, spring wheat and oats, together eventually made up almost three fourths of Siberia's field crops by area sown (74.8% between 1911 and 1915). In European Russia between 1911 and 1915, they covered on average only 38.2% of sown area. The important position of oats in Siberia as a major field crop was related to Siberia's large stocks of animals for which oats was the major feed grain. The predominant position of spring wheat was due to the fact that it was the most expensive of grains per unit weight; thus, the high railroad tariff for transporting grain added proportionally less to the price of Siberian spring wheat in European Russia than it did to other Siberian grains marketed in European Russia. Spring wheat was competitive in European Russian markets even with its high transport costs; other Siberian grains were not. Transport costs and their effects will be discussed later in greater detail.

Before the opening of the Trans-Siberian Railway, Siberia served more as a reserve supplier of grain rather than a regular supplier. In the 1880's, Siberia exported a total of only 63,000 tons of grain by steamer through Tiumen and Tara and into the Urals by wagon. Yet in 1892, Siberia exported some 180,000 tons to Petersburg because of the bad harvest in European Russia. In 1896, Siberia exported some 234,000 tons for the same reason. In 1895, however, the

harvest in European Russia had been good, so Siberia was able to export only 10,854 tons of grain. Nor was Siberia always a net grain exporter; Siberia had its own years of bad harvests. In 1901-1902, Siberia imported 306,000 tons of European Russian grain.[18] The graph on the following page shows both the general rising trend and the high variability of Siberian grain exports west by rail.

Before 1890, the commercial agricultural districts in soutern parts of Western Siberia marketed between 20% and 30% of their grain harvest.[19] In the bumper crop years of the early 1890's, the Siberian peasantry supposedly marketed some 40% of their total harvests.[20] Oddly enough, the figures for the share of grain marketed after the opening of the railroad are generally lower than those for after its opening. This in itself makes the figures for both before and after the opening of the railroad suspicious. S. Bazikin estimated that in 1909-1913, 15% of Western Siberian wheat was marketed; the equivalent figure for rye

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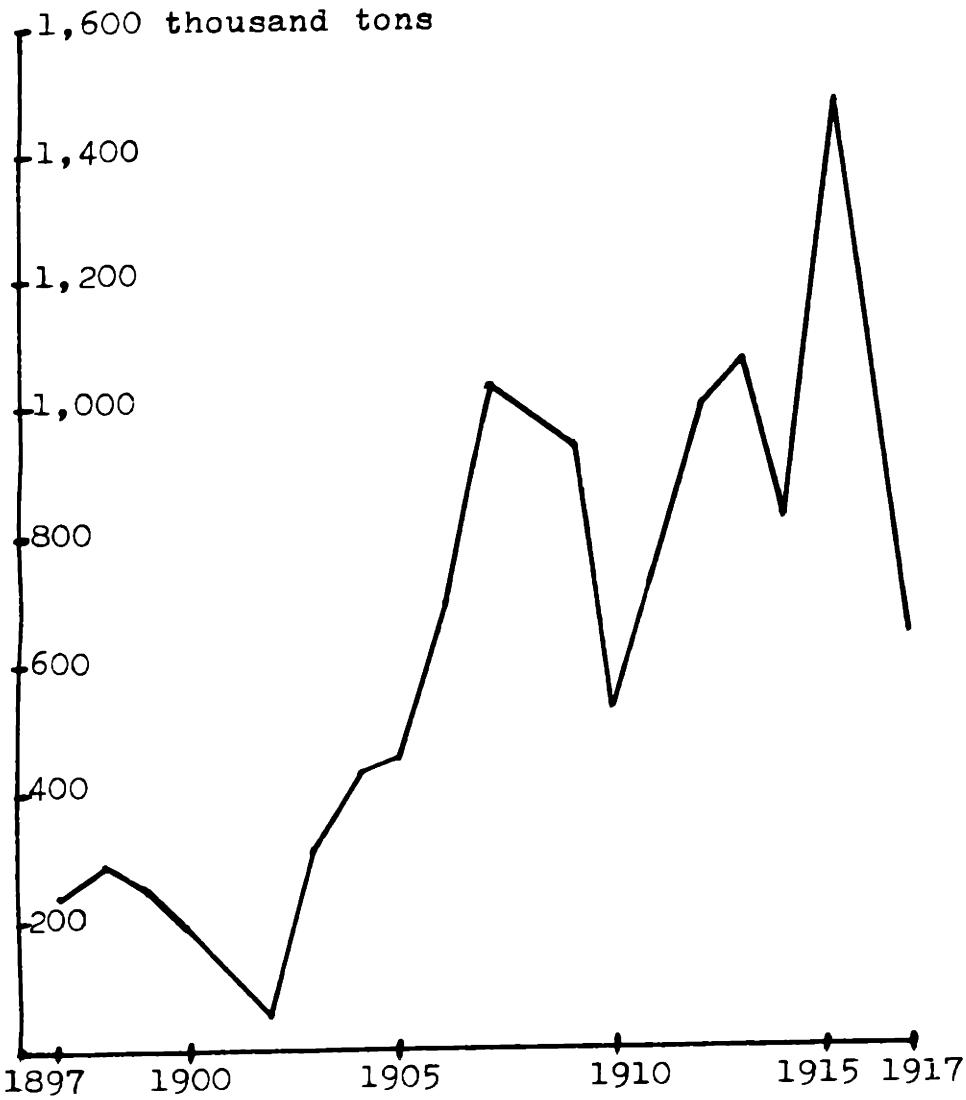
[18] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 31; Goriushkin, Sibirskoe Krest'ianstvo, p. 76; L.M. Goriushkin, Sotsial'no-Ekonomicheskoe Predposylki Sotsialisticheskoi Revoliutsii v Sibirskoi Derevnie (The Socio-Economic Preconditions of the Socialist Revolution in the Siberian Village), (Novosibirsk, 1962), p. 49.

[19] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 31.

[20] Goriushkin, Sibirskoe Krest'ianstvo, p. 75; Goriushkin, Sotsial'no-Ekonmicheskoe Predposylki, p. 49.

Figure III.1: Export of Siberian Grain Westward by Rail in Thousands of Tons (See Table 15 in Appendix for figures.)



was 21% and for oats and barley, 3.9%. In big exporting districts, the figures for the commercial share (the part marketed) of total production were 56% for wheat and 23% for rye.[21] A. Melkikh estimated the commercial share of Siberian grain production in 1913 at between 35% and 37%.[22] Borzunov picked 34%.[23] Goriushkin said 26%.[24] My estimate of the export share of gross Siberian grain production after 1905 is 24%.[25] Since the commercial share of grain output should exceed the export share by some significant percentage, the commercial share figure of 35% to 37% is most consistent with my own estimate of the export share of gross grain production.

With the commercial share of Siberian grain production so difficult to estimate, it is no wonder that I have found only one author willing to go a step further and hazard guesses as to the final destination of Siberia's commercial grain. N.I. Berezin states that of the Western Siberian

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[21] S.S. Bazikin, "Sel'shoe Khoziaistvo Sibiri i Zaselenie" Severnaia Aziia ("The Rural Economy of Siberia and Settlement," Northern Asia), 1929, #3, p. 42.

[22] A.M. Melkikh, Iz Ekonomicheskoi Zhizni Zapadnoi Sibiri (From the Economic Life of Western Siberia), (Moscow, 1912), p. 8.

[23] Osobennosti Agrarnogo Stroia Rossii v Period Imperializma, p. 176.

[24] Tiukavkin, p. 335.

[25] See Table 16 in the Appendix.

grain marketed in 1913, 13% was sold to local customers, 31% was exported to foreign countries, 10% was marketed in European Russia, 30% was sent to the Urals, and 16% was shipped to Eastern Siberia.[26] One might be surprised that Eastern Siberia was such a large grain importer. There were two reasons for this. First, soil and climatic conditions were less suitable for grain-growing in Eastern Siberia than in Western Siberia. Secon, Eastern Siberia was more heavily urbanized. The urban populations of Tomsk and Tobolsk gubernias (Western Siberia) were, in 1911, 7.9% and 6.6% respectively of total population. The equivalent figures for Eastern Siberia were 13% for Yeniseysk gubernia, 19.6% for Irkutsk gubernia, and 13.5% for Zabaikal oblast'. In addition, there were the gold mines on the Lena River and Yakutsk oblast' in which climatic conditions kept agriculture to a minimum. Thus, in Western Siberia there were thirteen peasants to feed one urbanite; but in Irkutsk gubernia the ratio was only four to one.[27]

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[26] Osobennosti Agrarnogo Stroia Rossii v Period Imperializma, p. 176; N.I. Berezin, Materiali po Voprosu o Vivoze iz Zapadnoi Sibiri Pishevikh Produktov i Zhivotnogo Siria i Polozhenie Zapadno-Sibirskogo Raiona po Otnosheniiu k Obscherusskomu i Mirovomu Rynkam Etikh Produktov (Materials Relating to the Question About the Export from Western Siberia of Food Products and Animal Products and the Position of Western Siberia in Relation to Russian and World Markets for These Products), (Moscow, 1921), p. 15, 31, 34.

[27] Tiukavkin, p. 340.

Furthermore, because of high transport costs, Amur and Primorsky oblast's in the extreme eastern portions of Siberia bought some 76% of their imported grain not from Western Siberia but from Manchuria.[28]

One further statistic concerning the final destination of Siberian grain may be of interest. In 1913, some 5 million poods (90,287.5 tons) of Siberian grain was purchased by the Commissariat for use in government distilleries and breweries. In addition, the Siberian Statistical Commission estimated that between 1915 and 1918, some 5.3 million poods (95,699.45 tons) of grain annually was used in the production of Siberian moonshine.[29] Unless the production of moonshine jumped dramatically between 1913 and 1915, we may estimate that the total amount of grain used in the production of alcoholic beverages in Siberia came to some 10.3 million poods (or 185.4 thousand tons) in 1913. This is 3.9% of the figure for total Siberian grain production for 1913 listed in Table 16 of the Appendix (4,960 thousand tons).

Meat

Before the opening of the Trans-Siberian Railway, Siberia had been exporting up to 1,800 tons of meat annually--

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[28] Osobennosti Agrarnogo Stroia Rossii v Period Imperializma, p. 178.

[29] Goriushkin, Sibirskoe Krest'ianstvo, p. 148.

mostly to the Urals.[30] At the same time that Siberian butter was becoming a dominant force on the world butter market, Siberian meat was gaining in importance in Russian markets. The growth of Siberian meat exports is apparent from the following table.

Table III.4: Meat Exports from Siberia for Selected Years[31]

Year	Meat Exported in Tons
"before 1896"	1,800
1900	45,000-54,000
1910	73,800
1911	73,800
1917	63,000

Most Siberian meat for export was shipped frozen to the large cities of European Russia. On the eve of World War I, Western Siberia alone annually exported 50,558 tons of meat of which 39% went to Petersburg and 30% to Moscow. Between 1903 and 1907, Siberia supplied 10% to 12% of all the meat sold on the major metropolitan markets of European Russia; in 1908 to 1913, this figure jumped to 45% to 50%.[32]

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[30] Goriushkin, Sibirskoe Krest'ianstvo, p. 169; Goiushkin, Sotsial'no-Ekonomicheskoe Predposylki, p. 65.

[31] See Table 22 of the Appendix.

[32] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 317; Aziatskaia Rossiia, Vol. I, p. 496.

Commercial sales involved about 7.5% of total stocks of animals annually, not including animals slaughtered for own use and not marketed.[33] Sheep and cattle in Siberia and the Far East were concentrated near the railroad.[34] The steppe districts of Akmolinsk, Semipalatinsk, Semirechinsk (Central Asia) and Zabaikal oblast's alone annually marketed up to 560,000 head in the years before World War I. About 160,000 steers and 120,000 sheep were driven from these districts to the big slaughterhouses at Omsk, Petropavlovsk, Kurgan and Cheliabinsk and later exported as frozen meat. In addition, about 100,000 steers and 80,000 sheep were driven to Ekaterinburg, Orenburg, and Perm, while 100,000 head went live by rail to European Russia and the Far East.[35]

The Far East was a significant importer of livestock not only from Western Siberia but from foreign countries. In 1908, Primorskaia oblast', which had 400,000 head of non-working livestock of its own, imported an additional 70,000 head from Amur oblast', Manchuria, and Korea. Amur oblast' alone imported some 5 million rubles worth of Mongolian cattle between 1909 and 1911. In addition, refrigerator ships delivered up to 9,028 tons of American and Australian meat

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[33] Osobennosti Agrarnogo Stroia Rossii v Period Imperializma, p. 176.

[34] Osobennosti Agrarnogo Stroia Rossii v Period Imperializma, p. 171.

[35] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 204.

to Vladivostok per year before the War.[36] This may seem surprising unless one remembers the great distances within Siberia: the distance from Moscow to Tomsk in Western Siberia is less than that from Tomsk to Vladivostok. The average annual exprt of all live meat-producing animals from all of Asiatic Russia was 288,500 for the period 1906 to 1910.[37] Further information about the export of animals and animal products (including wool, hides, and skins) from Siberia alone may be found in Tables 24 and 25 in the Appendix to this chapter.

In summary then, over the fifteen-year period from 1900 to 1914, the export of livestock products from Siberia increased by 80% or at a rate of 4% per year.[38] Most Western Siberian animals and animal products were exported to European Russia, and almost 70% of the meat shipped to European Russia was destined for the major markets of Petersburg and Moscow, of which Siberia eventually supplied almost half.[39]

This concludes our survey of the "bare facts" concerning the three major agricultural outputs of Siberia: butter,

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[36] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 321; Osobennosti Agrarnogo Stroia Rossii v Period Imperializma, p. 179.

[37] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 317; Tiukavkin, p. 363.

[38] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 318.

[39] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 317; Goriushkin, Sibirskoe Krest'ianstvo, p. 168.

grain, and meat. Hopefully, it has established the extent and nature of the agricultural boom which Siberia underwent between 1890 and 1917. The view of Siberian agricultural development as an insignificant occurrence in a remote and forgotten corner of the world has no basis in fact. Siberia's agricultural productive capacities were a force to be reckoned with both on the world market (in the case of butter) and on the Russian market (in the case of wheat and meat). The next section of this chapter will report the "bare facts" concerning the growth of Siberian agricultural inputs.

B. The Inputs Into Siberian Agriculture

The impressive growth in Siberian agricultural outputs chronicled above must stem from either growth in agricultural inputs, growth in their productivity, or some combination of the two. This section will discuss the three traditional economic inputs of land, labor, and capital, changes in their quantity and quality, and, finally, report the available information on crop yields per acre.

Land

Although the land area of Siberia dwarfed that of even the United States, its land area suitable for agriculture and other peasant activities was limited as the following table indicates.

Table III.5: Land Fund of Siberia Fit for Peasant Economic* Activity (in millions of acres)[40]

Officially Unoccupied State Lands		175.50
Officially Unoccupied *Kabinet* or Crown Lands		30.24
Cossack Lands		40.50
Owned by Individuals		2.43
State Lands in Peasant Use	39.96	
Kabinet Lands in Peasant Use	60.48	
Unclaimed Land in Peasant Use	142.56	
Total Land in Peasant Use		243.00
Total Land Fund		491.67

*Note: No date was given in source, but the title of the section under which the information appears refers to "the beginning of the twentieth century." Also, land was not officially recognized as owned by individuals until 1901.

Table III.5 covers land suitable for farming, grazing, lumbering, hunting, trapping, herding, and any other activity which a peasant might typically engage in. Mining, for example, is excluded. Waste land in an area generally suitable for peasant activity is also included. Land is excluded from the table only if soil and/or climate make it unsuitable for peasant use; thus, the table also reveals the limits nature has placed on the area of Siberian lands useful to the peasantry.

Table III.5 also hints at some of the problems and prospects involving the allocation of Siberian land which will be discussed throughout this work. There were 185.74 million acres of "officially" unused State and Crown lands just waiting for peasants to work them. This was approximately 38% of the total land fund of Siberia, which suggests that there was plenty of room for expansion of agriculture at the turn of the century. The adverb "officially" is included because there is no way of knowing how much of this land was occupied by peasant "squatters" whose very existence was unknown to the government. Another 243 million acres or 49% of the usable land of Siberia was in peasant use, yet not one acre of this land was officially owned by the peasant who worked it. Title to this land was either claimed by the State or Crown (which claim the peasant usu-

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[40]Tiukavkin, p. 25.

ally did not recognize) or was officially unowned. Here, along with the "squatter" problem, is yet another area of conflict in which the peasant and the State would collide head on.

Although the land devoted to field crops was a small proportion of the total area of land in peasant use, it is the only land type for which accurate statistics were kept for the region as a whole. The increase in land devoted to field crops is indicated in the following table. Equivalent figures for European Russia are included both to indicate the relative importance of Siberian field crops in Russia as a whole and to compare the increase of area sown in Siberia and in European Russia.

Table III.6: Area Sown to Field Crops in European Russia and Siberia[41]

Years	Siberia		European Russia	
	Thousands of Acres	Index Number	Thousands of Acres	Index Number
1901-05	9,183.0	81	172,271.0	98
1906-10	11,269.3	100	175,875.3	100
1911-15	15,660.0	139	183,269.2	104
1913	16,545.6	147	185,200.6	105
1916	16,224.8	144	167,597.1	95
1917	18,233.9	162	164,967.8	94

[41] N.P. Oganovsky, Sel'skoe Khoziaistvo Rossii v XX Veke (The Rural Economy of Russia in the Twentieth Century), (Moscow, 1923), p. 107. Conversion to acres and index numbers completed by me.

The index numbers in Table III.6 show the impressive growth of the area sown to field crops between 1901 and 1917; during this period, the area sown in European Russia hardly changed at all. While sown area increased dramatically in Siberia, the productivity of Siberian land expressed as value of output per unit of area sown changed very little as the following table indicates.

Table III.7: Average Output in Rubles Per Acre of Sown Area in Siberia and European Russia[42]

Years	In current Siberian Prices	In Current European Russian Prices	In 1906-10 Siberian Prices
	Value of Siberian Output Per Acre		
1901-05	10.93	12.47	11.86
1906-10	12.53	16.55	12.53
1911-15	13.21	17.31	11.42
	Value of European Russian Output Per Acre		
1901-05	11.30	12.76	16.10
1906-10	12.07	15.77	15.77
1911-15	15.38	20.23	17.52

Although the productivity of land per unit of area sown in Siberia and European Russia did not differ by much, the prices of land in these two regions differed by a very wide margin. Around 1906-1907, land prices in Western Siberia

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[42] Based on Oganovsky, p. 106-107 and on Tables 11-14 in the Appendix.

fluctuated between 3.70 and 7.40 rubles per acre.[43] The table below records the sale and purchase of land in Tobolsk gubernia for the years given.

Table III.8: Records of Officially Sanctioned Land Sales in Tobolsk Gubernia for Given Years[44]

Year	Number of Persons Selling	Number of Persons Buying
1908	35	41
1909	28	142
1910	41	72

Year	Acres Sold Per Seller	Acres Bought Per Buyer	Average Price in Rubles Per Acre
1908	572.4	486.0	10.37
1909	850.5	167.4	9.63
1910	780.3	194.4	17.77

Over the same period as Table III.8 covers, the average price for arable land in European Russia was 41.66 rubles per acre.[45] This is more than twice as much as the largest per acre price reported in Table III.8.

Land prices in Siberia did increase dramatically over time, however, and by the outbreak of the War were approaching the same range as prices for European Russian land. This price increase is reflected in Table III.9 below.

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[44]S.M. Dubrovskii, Stolypinskaia Zemel'naia Reforma (The Stolypin Land Reform), (Moscow, 1963), p. 382.

[45]Dubrovskii, p. 362.

Table III.9: Land Prices in Rubles Per Acre for Selected Districts of Siberia[46]

District	Average Prices in 1908-1912	Average Prices in 1914
Akmolinsk oblast' (Central Asia)	8.52-11.11	27.77-29.63
Tobolsk gubernia:		
a) Kurgan uyezd	18.52	37.04
b) Ishim uyezd	9.26	24.07
c) Tiukalinsk uyezd	14.82	29.63
d) Tarsk uyezd	2.59	12.95
Tomsk gubernia	14.82	25.90

In 1917, Siberia contained approximately 1,400,000 peasant households of which the vast majority lived in village communes. Approximately 118,300 of these households were landless; this was about 9% of the total.[47] Many of these, however, were households of village craftsmen or peasants still in the process of settling down. On the whole, the average peasant household of Siberia in 1917 worked 172.8 acres of land including 31.3 acres of good plowland and 17.8 acres of hayfields. By contrast, in the 38 gubernias of European Russia the average peasant household worked only 21.6 acres.[48] There can be no doubt that

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[46] Compiled from data in Aziatskaia Rossiia, Vol. II, p. 574-575.

[47] Tiukavkin, p. 27.

[48] Tiukavkin, p. 16.

the Siberian peasant was much better off than his European Russian counterpart with regard to the land area at his disposal and that availability of land was no constraint on the expansion of Siberian agriculture.

Labor

While the availability of land was not an effective constraint on the growth of Siberian agricultural output, the availability of labor was. And the availability of agricultural labor was constrained chiefly by the population of Siberia, specifically, the population of Russian peasants. The rural population of Siberia and its growth are suggested below; comparable figures for European Russia are also included.

Table III.10: Rural Populations of Siberia and European Russia[49]

Year	Siberia	European Russia
1897	4,466,100	70,018,500
1916	7,516,000	81,097,600
Growth 1897-1916	41%	14%

The general upward trend of population in Siberia is also reflected in the table below.

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[49] Oganovsky, p.19,21.

Table III.11: The Native and Russian Populations of Siberia[50] for Selected Years

Year	Natives	Russians and Foreigners*	Total	Per Cent of Russians and Foreigners
1622	173,000	23,000	196,000	12
1662	288,000	105,000	393,000	27
1709	200,000	229,227	429,227	53
1737	230,000	297,810	527,810	56
1763	260,000	420,000	680,000	62
1796-97	363,362	575,800	939,162	61
1815	434,000	1,100,500	1,534,500	72
1858	648,000	2,288,036	2,936,036	78
1897	870,000	4,889,633	5,760,169	85
1911	972,866	8,393,469	9,366,335	90
1921	-	-	11,070,000	-

*Note: Share of foreigners negligible, especially in later years.

The increasing size of the population as a whole and the growing importance of the non-native elements are evident from Table III.11. The Russians were most prominent in Western Siberia. By 1911, the proportion of Russians in Tobolsk and Tomsk gubernias had reached 95%; in Irkutsk gubernia, 80%; in the Transbaikal region, 70%; and in the forbidding Yakutsk oblast', only 7%.[51]

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[50]Treadgold, p. 32; percentages calculated by me.

[51]Treadgold, p. 227.

Siberia's population even today has an extremely low density and is very unevenly distributed. Over the period of interest here, 1890-1917, the overall density of population in Siberia was only 2.29 persons per square mile. By comparison, in 1911 European Russia claimed a density of 65.00 inhabitants per square mile.[52] However, Siberia's population was concentrated in only about one tenth of her total area which was located for the most part in a fertile strip about 400 miles wide in West and Central Siberia. This strip followed the railroad; other relatively heavily populated areas were to be found along the banks of navigable rivers. Near the railroad, the density of population jumped to between 18.4 and 22.9 people per square mile. In 1897, Tomsk gubernia had a population density of 5.8 per square mile; Tobolsk gubernia claimed 2.8 per square mile; Yeniseysk and Irkutsk gubernias had something less than 2.8 per square mile.[53]

The following table gives the population breakdown into urban and rural groups for the most important administrative districts of Siberia for the years 1897-1911.

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[52]Goriushkin, Sibirskoe Krestianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, p. 372.

[53]Tiukavkin, p. 28; Treadgold, p. 227.

Table III.12: Shares of Urban and Rural Populations in[54] Selected Districts of Siberia

Gubernia or Oblast'		Total Population	% Urban	% Rural
Akmolinsk	1897	682,608	11	89
"	1911	1,443,721	13	87
Tobolsk	1897	1,433,595	6	94
"	1911	1,975,239	7	93
Tomsk	1897	1,927,932	7	93
"	1911	3,673,746	8	92
Yeniseysk	1897	570,755	11	89
"	1911	966,409	13	87
Irkutsk	1897	515,070	12	88
"	1911	750,000	20	80
Total	1897	5,129,460	8	92
"	1911	8,809,115	10	90

Table III.10 to III.12 should establish the relative size of Siberia's rural population when compared to that of European Russia and the predominance of the Russian rural population in the total population of Siberia. The vast majority of this Russian rural population supported itself through agriculture and other typical peasant activities, and the vast majority of peasant agriculturalists were self-employed and worked their own plots. Attempts to estimate the size of the agricultural proletariat in Siberia have yielded a wide variety of results. This is because the

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[54]Generated from data in Aziatskaia Rossiia, Vol.I, p. 86-87.

Siberian peasantry moved in and out of the agricultural proletariat quite rapidly. A single source gives two very different estimates of the membership of the agricultural proletariat in Siberia in 1917. It attributes an estimate of "nearly 300,000 hired workers" to "Soviet investigators" and later apparently gives its own estimate of 370,000 hired agricultural workers.[55] This figure is also advanced by the Soviet scholar Tiukavkin, who calculated that out of the entire Siberian rural population of 9,599,000, between 370,000 and 375,000 persons worked as hired laborers. Tiukavkin further says that this proletariat composed about 8% of the adult rural population of Siberia in 1917.[56] He has apparently assumed that about half the rural population of Siberia was composed of children.

After the beginning of World War I, the role of prisoners of war in the Siberian agricultural economy became quite significant. By the autumn of 1917, 95,700 prisoners of war worked in the villages of Siberia.[57] Using the two estimates of the agricultural proletariat of Siberia in 1917 given above (300,000 and 370,000) as high and low estimates and adding the 95,700 prisoners of war, we can estimate that

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[55] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 327, 446.

[56] Tiukavkin, p. 276-277.

[57] Goriushkin, Sibirskoe Krestianstvo, p. 121.

the total number of agricultural laborers employed outside their own households in 1917 ranged between 395,700 and 465,700 with 21% to 24% supplied by prisoners of war. The effects of the War on the rural population were quite significant. According to the Ministry of Internal Affairs and the Rural Economic Census of 1917, almost 50% of the working men of Siberia had been drafted.[58] In 1917, hired agricultural labor was composed 25% of women and 37% of youths too young for conscription.[59] This leaves 38% of the hired agricultural labor force composed of men or from 114,000 to 140,600 in number. Assuming that the agricultural proletariat had lost 50% of its adult male members to conscription, its pre-war membership may be estimated at from 228,000 to 281,200 men, from 75,000 to 92,500 women, and from 111,000 to 136,900 youths. Thus, we may estimate the pre-war agricultural proletariat at from 414,000 to 510,600. There were too many factors affecting the size of the agricultural proletariat in either direction (toward larger size or toward smaller size) to determine its path over time. A reasonable approach, therefore, might be to consider the size of the agricultural proletariat before World War I as roughly constant at 462,300 (splitting the difference between

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[58] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 440.

[59] Goriushkin, Sotsial'no-Ekonomicheskie Predposylki, p. 106.

414,000 and 510,600). Prisoners and exiles of Russian origin supplied a significant share of the rural proletariat of Siberia, but their role will not be discussed at this point.

Since there are not even reliable head counts for the Siberian agricultural proletariat, it is not surprising that there is no information available on the quality of this labor. There is, however, some information on one measure of labor quality--the literacy rate--for the population of Siberia as a whole. In Western Siberia, which was much more densely settled and had a much larger urban population than Eastern Siberia and the Far East, only 10.8% of the entire population was literate in 1897. By 1920, this figure had climbed to 21.8%. The literacy rate among women in Western Siberia over this period was even less--between 4% and 5%.[60] Since there is no reason to expect agricultural laborers to be exceptionally well educated, it is reasonable to assume that this group was largely illiterate and that the figure of 21.8% given above are upper limits for the peasant literacy rate.

Thus, our picture of the Siberian agricultural worker holds no surprises. He was a peasant of Russian or related stock and usually illiterate. Most of the time, he worked his own plot. The evidence given above suggests that certainly no more than 20% of the Siberian peasantry were

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[60]Goriushkin, Sotsialno-Edonomisheskie Predposylki, p. 37.

agricultural proletariat with 10% probably being a more realistic figure. The evidence yet to be given below suggests that the hired agricultural worker in Siberia was much better off than his European Russian counterpart. The Siberian's advantage was that he usually operated within the setting of a tight labor market.

The relevant evidence is quite scarce; however, the Migration Administration in 1913 did investigate the states of the local labor markets in 2,522 villages in seven gubernias and oblast's across Siberia. Table III.13 reports the results of that investigation. Unfortunately, the results for two of the districts (probably Zabaikal and Semipalatinsk oblast's) were not given.

Table III.13: State of Village Agricultural Labor Markets[61] in Siberia in 1913

District	Per Cent of Villages With Labor Surplus	Per Cent With Labor Shortage	Per Cent With Labor Sufficiency
Akmolinsk	7.0	32.0	61.0
Tobolsk	5.2	35.8	59.0
Tomsk	5.0	46.0	49.0
Yeniseysk	5.2	50.0	44.8
Irkutsk	7.8	31.4	60.8
7 Districts	6	34	60

[61] Tiukavkin, p. 280; Goriushkin, Sibirskoe Krest'ianstvo, p. 112; Goriushkin, Sotsial'no-Ekonomicheskie Predposylki, p. 71.

In addition, the Soviet scholar Tiukavkin reports that both official and unofficial sources of the time constantly refer to extreme labor shortages.[62] In all of my investigations in preparing this work, I did not come across a single reference to any kind of labor surplus in Siberia in any of my sources except for column two in Table III.13.

Likewise, in comparing wage levels in Siberia with those in other regions of Russia, no source which has come to my attention has asserted that agricultural wage levels in European Russia were greater than or equal to those in Siberia. Goriushkin states that wages for agricultural labor in Siberia were higher than in European Russia.[63] Tiukavkin estimates the average annual agricultural wage across Siberia in 1913 at 90 rubles with food and clothing for a man; 42 rubles with same for a woman; and 35 rubles with food and clothing for a youth. He further estimates that food for a grown man cost 96 rubles per year and clothes cost 20 rubles. But since long-term employment 70% to 90% of the time was for two years, the clothing cost came to only ten rubles per year. Therefore, the total wages in cash and kind for a male agricultural worker came to about 196 rubles per year. The total wages for a woman worker was about 140 rubles per year; total wages for a youth were 125

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[62] Tiukavkin, p. 280.

[63] Goriushkin, Sotsialno-Ekonomicheskie Predposylki, p. 71.

to 130 rubles per year.[64] Strumilin estimated that a male agricultural worker in European Russia earned only 140 rubles per year including food and clothing.[65] Thus, a long-term male agricultural worker in European Russia earned only 71% of what he might in Siberia. It should also be noted that since the wage figures given above from Tiukavkin explicitly included payment of food and clothing for the worker in kind, the additional 90 rubles paid in cash to a male laborer was a true surplus (after some small deduction for shelter). With that amount he could just about feed and clothe another adult for a year; alternatively, he might also invest a large share of it in agricultural inventory eventually to work his own land. At any rate, he certainly was not paid subsistence wages unless he insisted on not using the labor power of his wife and/or working-age children.

Agricultural Capital--Machinery and Equipment

The capital requirements of a well-run independent agricultural household in Siberia were considerable due to the virtual self-sufficiency required by Siberia's great distances and poor transportation once one left the railroad. Gubernia officials warned newly arrived settlers that they must have two iron plows, two wooden plows,

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[64] Tiukavkin, p. 290.

[65] S.G. Strumilin, Ocherki Ekonomicheskoi Istorii Rossii (Essays on the Economic History of Russia), p. 221.

several harrows, two whetstones, a set of millstones for grinding grain, three axes, two large saws, two crow-bars, two sets of ice-breaking tools, pairs of spades, pitch-forks, sickles, and scythes, and a full collection of spare parts for various carts. Later, access to mowers, reapers, and other complex machinery was also considered a requirement.[66]

Between 1860 and 1895, the dominant agricultural implement in Siberia was the sokha--a wooden, iron-tipped plow which came in several variations. The kolesianka and saban' were wooden plows on wheels drawn by two or more horses. The rogaliukha and vilachukha were wooden plows without wheels pulled by a single horse. Iron plows were seldom seen until the 1880's when the permianki--all iron plows except for wooden shafts--appeared.[67] The next most important implement was the harrow. These were usually homemade and consisted of iron (occasionally wooden) teeth mounted on a wooden frame. Such homemade harrows could be found in poorly developed outlying districts as late as 1900. Hay-mowing and grain harvesting was usually done by hand with sickle or scythe. Threshing was accomplished with

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[66]L.F. Skliarov, Pereselenie i Zemleustroistvo v Sibiri y Gody Stolypinskoi Agrarnoi Reformy (Migration and Land Use Structure in the Years of the Stolypin Agrarian Reform), (Leningrad, 1962), p. 393.

[67]It should be noted that some investigators considered the Siberian plow superior to that used in European Russia. The Siberian plow usually had a mouldboard, a turned-up edge of the plowshare which turned the soil over as well as making a furrow, and several adjustments for regulating the depth of the furrow. The Siberian peasant plowed carefully.

flails or big larch stumps with wooden teeth hammered in.[68] In the late 1880's and early 1890's, such primitive equipment began to be replaced by mechanical threshers, winnowers, sorters, mowers, and reapers. Factory-made metal parts also appeared.[69]

But Siberia's stock of agricultural equipment was unevenly distributed and grew rapidly only with the opening of the Trans-Siberian Railway. Figures for early years are both incomplete and inconsistent. A study undertaken in 1887-1888 of Irkutsk and Balagansk okrugs of Irkutsk gubernia in Eastern Siberia counted a total on only 18 threshers and 40 winnowing machines.[70] Another study in 1895--only seven years later and supervised by the Eastern Siberian Division of the Geographical Society--counted 113 threshers and 654 reaping machines in those same okrugs.[71] Either the stock of threshers had increased 627% in seven years or at least one of the surveys was inaccurate, although we are told that

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[68] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 28-29; Goriushkin, Sibirskoe Krestianstvo, p. 91.

[69] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 29.

[70] Tiukavkin, p. 324.

[71] Tiukavkin, p. 325; U.A. Molodikh and P.E. Kulakov, Illiustrirovanye Opisanie Bita Sel'skogo Naseleniia Irkutskoi Gubernii. (Illustrative Description of the Way of Life of the Rural Population of Irkutsk Gubernia), (Petersburg, 1896), p. 108.

threshers and winnowers became increasingly widespread in Eastern Siberia in the 1890's.[72] Similar low machinery totals for various districts in Siberia in the 1890's may be found. In 1892 in all of Yeniseysk gubernia were counted only 1,743 winnowing machines and 169 threshing machines.[73] Four years later in 1896 Irkutsk gubernia is reported to have had a total of only eight reaping machines, five mowing machines, ten horse-drawn iron rakes, two weeding machines, and three spreading seeders.[74] The figure of eight reaping machines conflicts with that of 654 given above for only two okrugs within Irkutsk gubernia. In Zabaikal oblast' in 1897 were counted only 133 threshing machines and 227 winnowing machines.[75] By 1898, machinery was more common in Western Siberia, especially Tomsk gubernia.[76] In fact, by 1911 Western Siberia had 36,519 reaping machines and

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[72] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 29.

[73] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 29.

[74] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 29.

[75] Istoriia Buriat-Mongolskoi ASSR (History of the Buryat-Mongolian ASSR), (Ulan-Ude, 1954), Vol. I, p. 281.

[76] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 29.

European Russia had 66,381.[77] More systematic evidence of the uneven distribution of agricultural capital within Siberia will now be presented.

The following table gives totals of various kinds of improved agricultural equipment for the districts of Siberia in 1917. I have computed the percentage shares of each district in each total and enclosed them in parentheses below the corresponding absolute figures in order to give some idea of the distribution of the agricultural capital stock within Siberia. Akmolinsk oblast' was officially part of Central Asia, but it included Omsk uezd--an important part of Western Siberia today and economically an integral part of Western Siberia even before 1900.

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[77]George Katkov, Erwin Oberlander, Nikolaus Poppe, Georg Von Rauch, editors, Russia Enters the Twentieth Century, 1894-1917, (London, 1971), p. 146.

Table III.14: Totals and Percentage Shares of Agricultural Machinery and Improved Implements in Peasant Households of Siberia in 1917 (Percentage may not add to 100% due to rounding.)[78]

Administrative Unit	Single-Plowshare Iron Plows	Multiple-Plowshare Iron Plows	Seeding Machines
Akmolinsk Oblast'	61,222 (8%)	14,299 (28%)	31,546 (31%)
Tobolsk Gubernia	180,710 (24%)	9,839 (19%)	9,574 (22%)
Altai Gubernia	216,860 (28%)	23,952 (46%)	14,836 (34%)
Tomsk Gubernia	167,701 (22%)	1,648 (3%)	4,118 (10%)
Yeniseysk Gubernia	112,445 (15%)	355 (1%)	674 (2%)
Irkutsk Gubernia	23,090 (3%)	1,863 (4%)	382 (1%)
Total	762,028 (100%)	51,956 (100%)	43,130 (100%)

Administrative Unit	Mowing Machines	Horse-Drawn Rakes	Reaping Machines
Akmolinsk	18,376 (16%)	17,960 (17%)	- (0%)
Tobolsk	662 (1%)	877 (1%)	- (0%)
Altai	60,011 (52%)	53,837 (52%)	63,513 (62%)

(Continued)

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[78] Pogubernskie Itogi Vserossiiskoi Sel'skokhoziaistvennoi i Pozemel'noi Perepisi 1917 g. po 52 Guberniam i Oblastiam (Gubernia Totals of the All-Russian Rural Economy and Land Census of 1917 for 52 Gubernias and Oblast's), p. 26, 34, 60, 61, 74, 75, 86, 87.

(Table III.14, Continued)

Administrative Unit	Mowing Machines	Horse-Drawn Rakes	Reaping Machines
Tomsk	25,999 (22%)	29,049 (28%)	23,597 (23%)
Yeniseysk	10,206 (9%)	220 (0%)	12,281 (12%)
Irkutsk	1,179 (1%)	807 (1%)	1,450 (1%)
Total	116,433 (100%)	102,750 (100%)	102,841 (100%)

Administrative Unit	Binding Machines	Threshing Machines	Winnowing Machines
Akmolinsk	1,712 (12%)	6,732 (7%)	19,330 (8%)
Tobolsk	526 (4%)	28,535 (29%)	44,027 (20%)
Altai	12,029 (84%)	28,558 (29%)	82,838 (36%)
Tomsk	- (0%)	21,543 (22%)	49,076 (22%)
Yeniseysk	- (0%)	10,350 (10%)	24,900 (11%)
Irkutsk	- (0%)	3,463 (3%)	9,476 (4%)
Total	14,262 (100%)	99,181 (100%)	229,647 (100%)

It is difficult to find any sort of pattern in this table. Ideally, one would like to obtain totals and prices for each kind of agricultural capital equipment in the various districts in Siberia. Then one could easily construct comparable estimates of the total capital stock in

each district. Unfortunately, no such information is available. It should be remembered that the government could not even count the heads of immigrant peasants much less estimate the stock of capital they brought with them. The above table probably suffers from some inaccuracies and is obviously incomplete since it lists only certain specific types of machinery and gives no information about the vintage or state of repair of the machinery it does include. One fact can be seen from simple inspection: Altai gubernia contained the largest share of every type of machine listed in the table; furthermore, it contained a much larger share than its nearest rival except in the case of threshing machines. This is not surprising since Altai gubernia was a new governing district formed in 1917 from the old Altai territory--roughly the southern third of old Tomsk gubernia. The old Altai territory was a rich fertile steppe settled before the opening of the Trans-Siberian Railway. Its best lands, owned by the Tsar's Kabinet, had been rented out to old-settlers and Cossacks. Thus, it is not surprising that Altai gubernia had such a large share of Siberia's agricultural machinery: it was an area of rich land (rich enough to command a rent in Siberia before the Railroad); it had been settled earlier than the other districts and had more peasant households; and it was steppe--topographically suited to mechanized cultivation.

In order to derive some interesting figures from Table III.14 above, I took an arithmetic average of the machinery

shares in that table for each district.[79] The districts listed in descending order of average machinery shares from Table III.14 are as follows: Altai, 47.0%; Tomsk, 16.9%; Akmolinsk, 14.1% Tobolsk, 13.3%; Yeniseysk, 6.7%; Irkutsk, 2%. A glance at a map shows that with the exception of Altai and Tomsk gubernias, the districts are listed in order of distance from European Russia. The special considerations given above applying to Altai gubernia also apply to Tomsk gubernia but less strongly. Akmolinsk and Tobolsk are both

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[79]Admittedly, such a rough-and-ready procedure is fraught with peril. It involves adding up shares of very different types of equipment--adding "apples and oranges" so to speak. The procedure is even worse than this, however, since the types of equipment involved, unlike apples and oranges, differed greatly in price. (Table 25 in the Appendix shows that from 1908 to 1911, single-plowshare plows cost about 22 rubles each; a McCormick binding machine in 1906-1908 cost 387 rubles--over seventeen times as much.) The price difference alone biases the rough averages given above against the more expensive machinery. For example, a district which contained ten out of the hundred plows in all of Siberia certainly contained less machinery by value than another district which contained ten out of the hundred McCormick binders in all Siberia. Yet the figure entering the average computed above would be 10% for either district. The more expensive type of equipment is not weighted more heavily than the less expensive as it should be. There is another bias working against this one, however. It is based on the fact that less expensive equipment is more common than more expensive. Thus, 10% of 1,700 plows was quite close in total value to 10% of a hundred McCormick binders. With these two biases working against each other, there is no way of telling whether this procedure of averaging the shares of the types of equipment in each district overestimates or underestimates the share of total value of equipment to be found in any district. Despite these criticisms of this procedure, the results are sufficiently interesting to be worth discussing.

on the western end of Siberia, but Akmolinsk is farther south--most of it is in Central Asia. The fact that the average shares line the districts up in order of distance from European Russia means that the districts are lined up in order of distance from the source of new-settlers, major markets for agricultural products, and major sources of agricultural machinery. Despite the impropriety of averaging shares of different types of machinery, the importance of distance from European Russia is suggested.

In the next table, Siberia's stocks of various kinds of agricultural equipment are compared with those for the area which eventually became the Russian Soviet Federated Socialist Republic after the Revolution. This comparison will help to relate the size of the Siberian agricultural capital stock to the stock of Russia as a whole.

Table III.15: Totals of Various Types of Agricultural Equipment (in thousands of pieces) in Siberia and the Area Which Became the RSFSR in 1910 and 1920[80]

Equipment	Year	Siberia	RSFSR	Siberian Shre of RSFSR Total
Plowing Implements				
Primitive Wooden Plows	1910	647.7	8,575.8	8%
	1920	148.0	4,604.0	3%
	1920÷1910	0.23	0.54	0.38
Iron Plows	1910	293.5	2,250.6	13%
	1920	566.1	4,278.3	13%
	1920÷1910	1.93	1.90	1.00
All Plowing Implements	1910	953.8	10,877.0	9%
	1920	718.5	9,012.1	8%
	1920÷1910	0.75	0.83	0.89
Hoeing Implements				
Harrows	1910	1,835.9	13,143.4	14%
	1920	863.7	8,508.0	10%
	1920÷1910	0.47	0.65	0.71
Iron Hoeing Implements	1910	4.1	150.8	3%
	1920	8.3	453.4	2%
	1920÷1910	2.02	3.01	0.67
All Hoeing Implements	1910	1,837.4	13,229.7	14%
	1920	864.0	8,525.6	10%
	1920÷1910	0.47	0.64	0.71
Seeding Machines	1910	1.3	72.3	2%
	1920	9.3	126.6	7%
	1920÷1910	7.15	1.75	3.50

(Continued)

[80]Oganovsky, p. 130-131.

(Table III.15, Continued)

Equipment	Year	Siberia	RSFSR	Siberian Share of RSFSR Total
Harvesting Machines				
Hay-Mowing Machines	1910	79.3	196.4	40%
	1920	150.8	344.1	44%
	1920-1910	1.90	1.75	1.10
All Harvesting Machines	1910	122.0	417.3	29%
	1920	224.1	709.4	32%
	1920-1910	1.84	1.70	1.10
Threshing Machines				
Horse-Powered Threshers	1910	36.3	273.3	13%
	1920	31.7	179.1	18%
	1920-1910	0.85	0.62	1.38
Steam-Powered Threshers	1910	-	4.0	0.0
	1920	-	3.6	0.0
	1920-1910	-	0.90	-
All Threshing Equipment	1910	38.9	310.1	13%
	1920	80.4	727.9	11%
	1920-1910	2.07	2.35	0.85
Winnowing Machines	1910	77.6	916.4	8%
	1920	161.3	834.9	19%
	1920-1910	2.08	0.91	2.38

Many peculiarities of Siberian agriculture are reflected in the percentage figures in the last column of the table. Since Siberia possessed approximately 8% of the sown area of Russia, one would expect that if Siberian agriculture was average in all respects, approximately 8% of each general type of equipment would be found in Siberia. Extreme

deviations from this figure require explanation. Siberian peasants possessed 13% of the iron plows in Russia both in 1910 and 1920. This may be explained by the fact that Siberian peasants were more likely to work virgin land, which requires more and harder plowing than previously worked land, than other Russian peasants. Both the influx of new-settlers and the long-fallow system of field use (Work the land until it is worn out, then leave it in long fallow and work a new section.) militated in this direction. Thus, the iron plow was proportionally more in use in Siberia since it could withstand more intensive use than the wooden one.

The percentage figures in the last column under hoeing implements are a mystery to me. Siberia possessed 14% of all hoeing implements (mostly harrows) in 1910 and 10% in 1920. Yet her share of iron implements in this category was only 2% to 3%. The reasoning in the above paragraph would lead one to expect Siberian peasants to strongly favor iron harrows and other such implements. The purchase of seeding machines was evidently slow to start in Siberia (They are both more expensive and less essential than other improved implements.), but between 1910 and 1920, her share in the Russian total increased by three and a half times.

Siberia's share of Russia's stock of harvesting machines was dramatically out of proportion to her share of Russia's sown area. A short growing season with the threat of an early frost, expensive and scarce labor especially at harvest time, and extensive use of land all combined to make Siberia

the ideal customer for harvesting machines. Siberia's even larger share of hay-mowing machines is consistent with the fact that a larger share of her farmed area was devoted to hayfields than was the case in most other parts of Russia. The large proportion of Russia's threshing and winnowing equipment present in Siberia might also be attributed to efforts to save labor and time. The motivation to save labor stemmed from the scarcity of agricultural labor in Siberia and the relatively high wages Siberian laborers drew. The need to save time was due to the Siberian winter. Grain not shipped in time might have to be stored in warehouses either in ice-locked ports or in Siberia until the spring thaw allowed delivery. This consideration also applied to the need to harvest quickly. I can think of no convincing reason for Siberia's failure to adopt the steam-powered thresher unless the war made them especially difficult to obtain. (There were only 4,000 in all the area which became the RSFSR in 1910 and only 3,600 in 1920).

The changes which took place between 1910 and 1920 in Siberian stocks of the various types of agricultural equipment listed in the table were roughly proportional to changes which took place in all-Russian stocks. Only in seeding and winnowing machines was growth of Siberia's stocks radically different from the growth (or shrinkage in the case of winnowing machines) of all-Russian stocks. It should also be noted that decreases in stocks of more primitive types of

implements (wooden plows, hoeing tools, horse-powered threshers) were accompanied by increases in stocks of improved implements used for the same purposes (iron plows, iron hoeing implements, other types of threshers). Thus, the decrease in stocks of primitive implements does not indicate a decrease in capital services of the kinds provided by those stocks; rather, those services were provided by new, improved implements. Siberian agriculture in particular and Russian agriculture in general in the cases of plows, hoeing implements, and threshers were not decreasing their capital service inputs but embodying those services in fewer and more durable pieces of equipment.

Siberia's relatively large share in Russia's stock of agricultural capital equipment and its rapid growth meant that Siberian peasant households had access to more and better equipment than their counterparts elsewhere--even in European Russia. Peasant households in European and Asiatic Russia were of roughly the same size, yet by 1910, there were 2.25 pieces of agricultural machinery in Asiatic Russia (Siberia plus Central Asia) for each peasant household; the equivalent figure for European Russia was 1.80.[81] In Siberia and the Steppe Territory (northern Central Asia) in 1910, 76.6% of all agricultural machinery was of an

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[81] Aziatskaia Rossiia, Vol. I, p. 406; Tiukavkin, p. 328; Geshele, p. 55.

"improved" type; in European Russia, only 57.1% was "improved".[82] In Asiatic Russia, 37.5% of plowing equipment was "improved"; in European Russia, 32%. Percentages of "improved" equipment for hoeing were 94.5% for Asiatic Russia and 70.9% for European Russia. 99% of harvesting machinery in Asiatic Russia was considered "improved"; in European Russia, 98.1%.[83]

In regard to use of specific pieces of equipment, only 29.6% of the peasants of European Russia used an iron plow. The equivalent figure was 31.1% in Western Siberia, 81.7% for the Steppe territory, and 22.1% for Eastern Siberia.[84] These figures reflect biases in the use of certain types of equipment as well as Siberia's disproportionately large share of new and improved machinery. It has already been noted that Siberia's extensive working of virgin land made the iron plow more essential there than in European Russia. On the other hand, in 1910, 60% of Erupean Russian peasants used winnowing machines: this machine was little used beyond the Urals.[85] Siberia

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[82] Aziatskaia Rossiia, Vol. I, p. 406.

[83] No definition of "improved" was given in the source; however, some general characteristics were apparent. Iron was an "improvement" over wooden parts; factory-machined equipment was an improvement over craft-produced pieces.

[84] Aziatskaia Rossiia, Vol. I, p. 406.

[85] Aziatskaia Rossiia, Vol. I, p. 406.

was better equipped than European Russia in general because Siberia was a newly-opened and rapidly growing frontier territory. There were regions in European Russia, however, which were just as well or better equipped than Siberia; examples were the "young steppe" districts, the Ukraine, and the Baltic provinces. These regions tended to heavily mechanize harvesting, seed cleaning, threshing, and hay-mowing while half their tilling implements were still made of wood.[86]

Agricultural Capital-Livestock

The livestock of Siberia performed labor, supplied animal products such as milk and hair when alive, and was a source of meat, fat, and hides after slaughter. Animal husbandry did not arrive with the first Russian settlers; it was a highly developed industry among native Siberian tribes long before the "great Siberian migration." Nor did the Russians revolutionize animal husbandry with new techniques and new breeds upon their arrival. The Russian peasants brought few animals with them and those they did bring usually adapted poorly to Siberia's harsh living conditions. The Russians did, however, provide a railroad and access to large markets for animal products to the west as well as a market in Siberia itself. Both native and peasant livestock-raising based largely on native breeds responded to this stimulus.

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[86]Tiukavkin, p. 329.

The regions which developed commercial raising of livestock combined good (by Siberian standards) conditions for the stock with proximity to the railroad for ease of shipment. The districts with the most developed livestock industry in the early 1900's were Akmolinsk oblast', the steppe and wooded-steppe areas of Kurgan and Tiukalinsk uezds of Tobolsk gubernia, Kainsk uezd and the southwest Altai (Biisk and Barnaul uezds) of Tomsk gubernia, Minusinsk uezd of Yeniseysk gubernia, and the south and southeast of Zabaikal oblast'. Zabaikal oblast' was especially favored with wide steppe, little snow, and availability of winter fodder, salt, and water. The main problem in the other districts was a shortage of winter fodder. The animals were fed hay and straw in the winter; oilcakes and coarse fodder were not used. Rich Russian peasants of Western Siberia often solved the winter fodder problem by cultivating feed grasses and root crops. Other peasants, especially in Eastern Siberia, imitated the natives by moving their animals between winter and spring pasturage.[87]

There is some evidence to indicate that Siberian stock was of poorer quality than the livestock in other parts of Russia. Siberian stock was usually smaller and scrawnier, but this was quite probably due to the rugged conditions under which Siberian livestock lived. The coming of the

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[87]Tiukavkin, p. 351.

railroad opened new markets for meat and butter; this, in turn, encouraged efforts to import better breeds from European Russia. Often, though, these breeds could not adapt well to Siberian conditions, so a long process of cross-breeding with hardier Siberian stock became necessary. Siberian stock had two factors in its favor: endurance of harsh conditions and a tendency to produce uncommonly rich milk. This latter trait is undoubtedly linked to the former. Without rich milk, young animals would die under Siberian conditions and the breed would become extinct.[88]

Tables 26 through 34 and the accompanying graphs and text in the Appendix to this chapter give a picture of the path of livestock totals in Siberia and its districts. A few totals for Russia and European Russia have been included to facilitate comparison. The second half of the nineteenth century was largely a period of slow steady growth of livestock totals. In the Altai district of Tomsk gubernia, which was quite probably Siberia's leading district in both agriculture and animal husbandry, the total number of horses increased by 42.4% to almost a million between 1860 and 1899. In that same period the Altai's stock of cattle increased by 53% to 837,000.[89] [8, p. 68] These growth

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[88]Tiukavkin, p. 352-353.

[89]Goriushkin, Sibirskoe Krest'ianstvo, p. 68.

figures are not very impressive when one remembers that they cover a period of 39 years. Growth of Siberian livestock totals increased dramatically with the coming of the railroad as the following table indicates.

Table III.16: Index Numbers for Livestock Totals in Siberia[90] and Districts for 1917 (1897 = 100)

District	Total Livestock*	Horses	Cattle
Akmolinsk**	276.8	306	385
Tomsk	137.7	121	153
Tobolsk	172.8	144	188
Yeniseysk	180.0	127	247
Irkutsk	149.6	122	167
Zabaikal	101.9	95	99
Total	156.1	139	169

*These figures are for "all stock in translation to large," but the equivalency formulas for the translation were not given.

**Akmolinsk oblast' was part of Central Asia but included Omsk uezd, an important part of Siberia.

The figures in Table III.16 and graphs A.1 through A.5 inserted in the Appendix all reflect an impressive though uneven growth in livestock totals in Siberia and its districts. The index numbers above further indicate that the stock of cattle increased more than did the total stock

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[90]Tiukavkin, p. 356.

while the stock of horses increased less. In fact, the share of cattle in total livestock (translated into cattle equivalents increased from 47.7% in 1897 to 52.6% in 1917.[91] [7, p. 357] Thus, we find between 1897 and 1917 a pattern of overall growth with the composition of Siberian livestock shifting away from horses and toward cattle. This is not surprising since it reflects the growth of the butter industry.

Also of interest is the question of the exact period in which the Siberian livestock boom took place. All the graphs for Siberian domestic animals except the one for horses (Graphs A.1 and A.3 through A.5 in the Appendix) turn upward around 1908 and do not turn downward again until 1917. With the added information that the total number of maturing stock in 1897 in Siberia was 8,305,600 and in 1908 was still only 8,532,000, we can conclude with reasonable certainty that most of the growth in Siberian livestock totals took place outside this period, that is, it took place after 1908. The number of maturing stock in Siberia in 1917 was 13,874,400; this indicates a substantially larger potential for growth in 1917 than in 1908.[92]

These figures lead one to the comfortable conclusion that livestock totals followed the migration of Russian European peasants into Siberia; this migration peaked in 1908.

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[91]Tiukavkin, p. 357.

[92]Goriushkin, Sotsialno-Ekonomicheskie Predposylki, p. 57.

However, other sources tell us that the total number of livestock in Siberia in 1910-1912 was only 111% of the total number in 1898-1900.[93] In 1917, the total number of livestock in Siberia was 161% of its 1898-1900 level.[94]

This places a large percentage growth in livestock totals between 1913 and 1917. There is little doubt that Siberian livestock totals increased substantially over the entire period from 1890 to 1917, but the fact that much of this growth apparently occurred during World War I--a full six years after migration peaked--is a bit strange.

Nevertheless, Siberia's share of Russia's livestock totals are quite impressive. In 1913, Siberia possessed nearly a sixth of the horses and cattle and a ninth of all the sheep in the Russian Empire, yet Siberia had only one fortieth of the Empire's rural population. Siberia also harvested a fifth of all the hay in the Empire.[95]

Since much of the increase in Siberian livestock may be attributed to the increase in rural population brought on by the great migration, it would be of interest to investigate to what extent the increase in livestock was independent of the population increase. Tables 35 through 40 and Graphs A.6

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[93] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 316; Osobennesti Agrarnogo Stroia Rossii v Period Imperializma, p. 170.

[94] Osobennosti Agrarnogo Stroia Rossii v Period Imperializma, p. 170.

[95] Oganovsky, p. 274-276.

through A.11 in the Appendix are similar to Appendix Tables 26 through 34 and Graphs A.1 through A.5 except that the former present livestock totals per 100 inhabitants; thus, the effects of population increase have been allowed for.

The upward trend in the graphs for livestock totals (A.1 through A.5) all but disappears in the graphs for livestock per 100 inhabitants (A.6 through A.11). In most cases, the only obvious increases in stock per 100 inhabitants occur after 1914. The growth of Siberia's livestock totals was quite impressive, but it could not keep up with the growth in population. The general trend was one of growth of livestock totals but of decline in livestock per unit of population.[96] Siberia's animal husbandry industry was expanding horizontally (with some changes in livestock composition), but this expansion did not involve a switch to be more animal-intensive (more stock per 100 inhabitants) agriculture. In fact, in 1914 in the four Siberian gubernias the total number of producing livestock per inhabitant was only 90.9% of what it had been in 1864. (The same figure for European Russia was 60.1%).[97]

In 1916-1917, Siberian agricultural households averaged 16 to 20 head of livestock each; the equivalent figure for

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[96] Skliarov, p. 491.

[97] Skliarov, p. 489.

European Russia was only 8 to 9 head.[98] The difference is, indeed, striking, but some of it may be due to the fact that European Russian stock could reach its markets or be requisitioned during the war years while Siberian stock could not.

The last table in our exhausting (but not really exhaustive) study of Siberian livestock totals concerns the proportions of each type of stock in the total livestock.

Table III.17: Percentages of Types of Livestock in the Total* Livestock in 1916-1917.[99]

Type of Livestock	RSFSR	European Russia	Siberia
Horses	16.7	16.6	21.8
Cattle and Cows	27.4	27.2	33.2
Sheep	43.2	42.4	32.3
Goats	1.6	1.0	0.7
Pigs	11.0	12.4	12.0

*Totals may not add to 100.0% due to rounding.

The relatively greater importance of horses in Siberian livestock is not surprising due to Siberia's greater dependence on horses for transport; Siberia had fewer navigable rivers running in the right directions and her rail network

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[98] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 270.

[99] Oganovsky, p. 266-267.

was not well developed. The larger proportion of cattle and cows may be attributed to dairy cows which supplied milk to Siberia's great butter industry.

This completes our review of the magnitudes, growth, and mix of Siberia's livestock holdings before the Revolution.

Crop Yields

Information on crop yields per acre for Siberia is spotty, incomplete, and often inconsistent as Table 41 in the Appendix demonstrates. Nevertheless, Russian Department of Agriculture figures for yields of grain crops in Siberia are reported in Table III.18 below.

Table III.18: Yields of Grain Crops in Siberia in Pounds[1] Per Acre

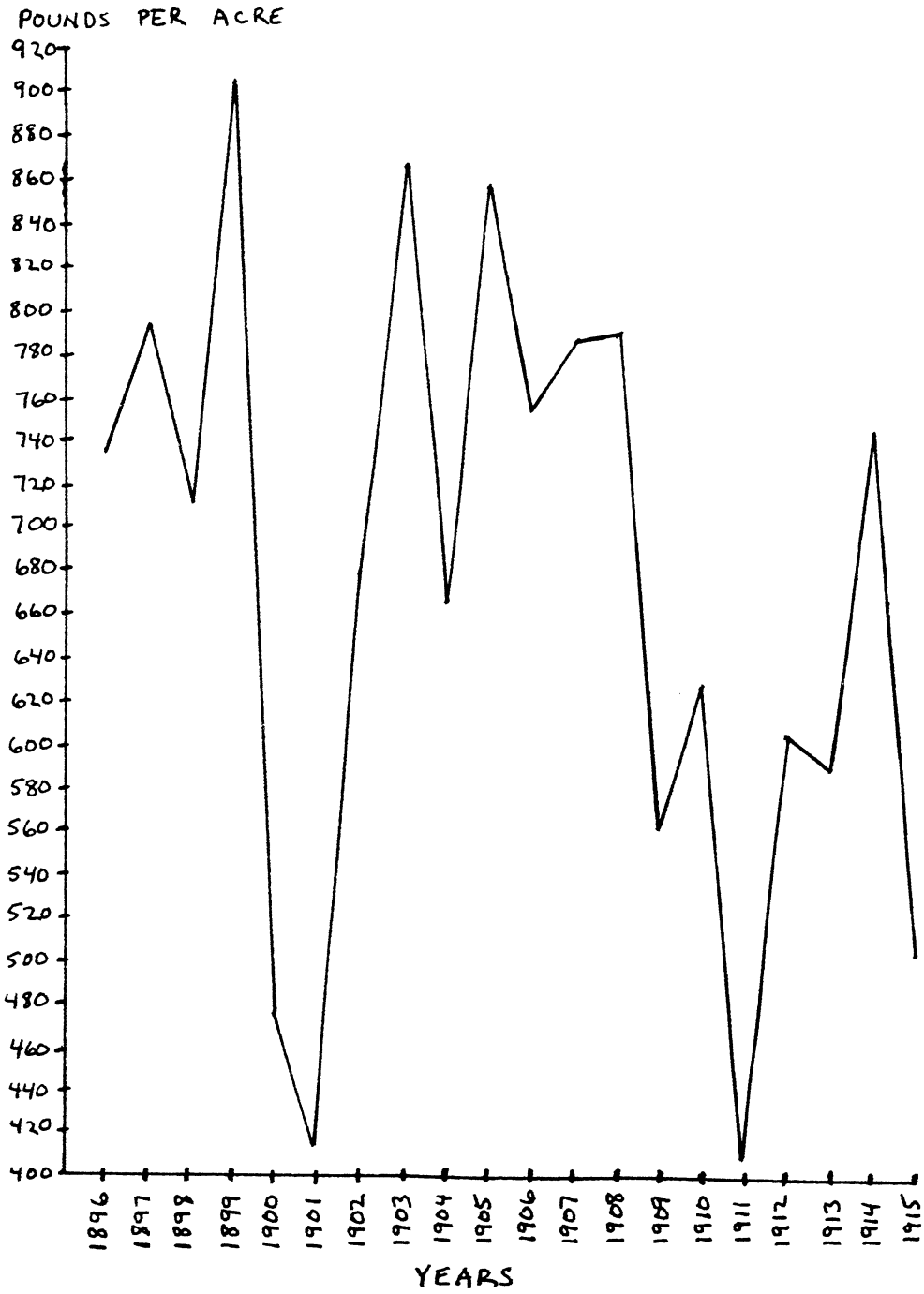
Year	Average Yield	Year	Average Yield
1896	735.90	1904	666.32
1897	793.43	1905	856.32
1898	707.80	1901-1905	696.29
1899	905.83	1906	755.97
1900	474.99	1907	786.74
1896-1900	723.59	1908	790.76
1901	410.77	1909	560.62
1902	679.70	1910	627.52
1903	868.36	1906-1910	704.30
		1911	402.72
		1912	603.44
		1913	587.38
		1914	742.59
		1915	501.75
		1911-1915	567.58

[1]Goriushkin, Sibirskoe Krest'ianstvo, p. 377.

A glance at Figure 2 on the following page reveals a steady decline in peak yields per acre sown after 1899. A Marxist might interpret this decline as a symptom of capitalist exploitation and exhaustion of the soil. A more favorable interpretation would consider the decline in yield per sown acre as an effect of both the working of previously unused and less fertile land and the use of land-extensive agricultural techniques made economical through mechanization. Whatever the reason, the steady decline in peak total grain yields per acre is obvious. Figures for yield per unit of area sown broken down by crop, district, and land user (peasant versus non-peasant) are available for the uears after 1900. Five-year averages for these figures are provided in Table 42 in the Appendix.

Appendix Table 42 provides some interesting insights into comparative crop yields per sown acre for peasant and non-peasant groups. The latter was composed of individuals who operated farms but were not members of the peasant estate. This group was evidently composed of Cossacks, natives, and non-peasant commercial farmers. There are 48 instances in Appendix Table 42 in which yields per acre are available for both peasants and non-peasants. In these 48 instances, peasants and non-peasants collected the same average yield per acre in only two cases and peasants enjoyed a higher yield in only 11 of the 46 remaining cases. If we give each group (peasants and non-peasants) one point each

Figure III.2: Yields of Grain Crops in Siberia in Pounds Per Sown Acre



time its yield per acre exceeds that of the other group, then the two groups have a tied score for only one crop--potatoes. And the peasants lose by only one point for two other crops--barley and hemp. For all other crops in the table, non-peasant yields per acre are definitely larger. There are a number of possible reasons for this: more land-intensive farming by non-peasants, greater overall efficiency among non-peasants, or simply better land among non-peasants. Attempts to find a geographical pattern for crop yields per sown acre within Siberia revealed nothing.

Table 43 in the Appendix is similar to Appendix Table 42 except that the figures compare yields per sown acre of crops in Siberia as a whole with other regions of Russia. The first important point to be noted is that the apparent trend of decline in total grain yields per unit area sown up to 1915 (See Table III.18 and Figure 2.) is not noticeable in Appendix Table 43 for any crops except possibly potatoes, flax, and hemp. Indeed, all grain crops registered increasing average yields per acre between 1901 and 1915 in Siberia. This suggests that the decline in yields per unit area sown for all grain taken together must be the result of changing proportions of the various grain crops. Thus, yields per acre were not falling; instead, low yield-per-acre crops were being allotted proportionally more of the total sown area. The reasons for this change in crop proportions will be discussed in following chapters.

Second, if we compare the figures in the rows of Appendix Table 43, we find that Siberia was not greatly different in yields per acre from the average for either European Russia or the area which became the RSFSR after the Revolution. The main differences are that the Siberians did not plant winter wheat, that their yield per acre of spring wheat was usually higher and their yield per acre of buckwheat usually lower than the corresponding figures for either the RSFSR of European Russia.

Appendix Table 44 is intended to put Siberian grain yields per sown acre into perspective by comparing them with corresponding figures for the United States and Germany. This table should not be interpreted, however, as conclusive evidence of inefficient use of agricultural land in Siberia (or in the United States, for that matter). Siberian weather conditions by themselves could probably explain a large measure of the difference in yields between Siberia and the two countries.

This concludes our survey of crop yields in Siberia. The few conclusions we have been able to draw from the available information are as follows: peak yields of grain in general per acre sown declined steadily after 1899; this decline was not apparent in five-year average figures for the various grains taken separately suggesting that the decline in general grain yield may have been due to a change in the mix of grains sown; non-peasants for a number of

possible reasons usually enjoyed higher yeilds per sown acre than peasants; and the yield per acre in Siberia was not radically different from the average yield in either European Russia or the area which eventually became the RSFSR.

Concluding Statement

This sketch of the "bare facts" concerning the agricultural development of Siberia in the quarter century before the Russian Revolution is now complete. The growth and economic significance of Siberia's three chief agricultural products--butter, meat, and grain--have been established, and the increase in agricultural inputs which accompanied this growth in outputs has been reviewed and put into perspective with comparisons to European Russia. The remainder of this work will be concerned with identifying and explaining the forces affecting the growth in both agricultural inputs and outputs discussed in this chapter.

Statistical Appendix to Chapter III

Table 2: Butter-Making Plants in Siberia, 1894-1913

Year	Total Plants	Per Cent Increase Over Previous Year*	Total Artel Plants	Share of Artel Plants in Total Number*
1894	1	-	-	0%
1895	15	1400%	-	0%
1896	30	100%	4	13%
1897	52	73%	10	19%
1898	101	94%	13	13%
1899	242	140%	16	7%
1900	277	14%	35	13%
1901	380	37%	51	13%
1902	564	48%	101	18%
1903	728	29%	157	22%
1904	937	29%	242	26%
1905	1,181	15%	359	30%
1906	1,478	24%	526	36%
1907	1,887	27%	761	41%
1908	2,347	24%	987	42%
1909	2,889	23%	1,200	42%
1910	3,109	8%	1,337	43%
1913	4,092	32%	almost 1/2 of total	50%

*calculated by me.

Note: Peasant cooperatives or artel plants were not significantly different in size from privately-owned plants.

Source: L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967),p.159.

Table 3: Amounts, Values, and Average Prices in Siberia of Siberian Butter Exports to Foreign Countries by Years (1 pood = 36.113 pounds)

Year	Weight in Poods	Total Value in Rubles	Average Price in Rubles Per Pood
1894	400	4,000	10.00
1895	5,000	50,000	10.00
1896	27,000	279,000	10.33
1897	48,000	490,000	10.21
1898	160,000	1,589,000	9.93
1899	310,000	3,473,000	11.20
1900	1,050,000	11,886,000	11.32
1901	1,201,731	16,139,000	13.43
1902	1,609,980	21,536,000	13.38
1903	1,746,410	22,232,000	12.73
1904	2,003,315	23,621,000	11.79
1905	2,039,120	26,723,000	13.11
1906	2,973,713	41,454,000	13.94
1907	3,413,640	44,513,000	13.04
1908	3,310,250	48,429,000	14.63
1909	3,354,301	47,094,000	14.04
1910	3,917,400	58,369,000	14.90
1911	4,363,400	65,538,000	15.02
1912	4,459,901	68,000,000	15.00
1913	5,670,000		
1914	3,287,000*		
1915	4,613,000*		
1916	3,175,000*		
1917	3,521,000*		

*Includes sales to military.

Sources: Aziatskaia Rossiia, Vol. I, (Petersburg, 1914), p. 332; V.G. Tiukavkin, Sibirskaia Derevnia Nakanunie Oktiabria, (Novosibirsk, 1966), p. 365, 378; L.M. Goriushkin, Sibirskoe Krestianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p. 162.

Data Relating to Agricultural Outputs

Table 1: Butter Prices in Rubles per Pood (1 pood = 36.113 pounds) on Various Markets in the Years 1911-1913

Market	1911	1912	1913
Siberia			
Novonikolaevsk	14.12	14.97	14.76
Omsk	14.59	14.86	14.19
Kurgan	14.30	15.30	14.41
European Russia			
Petersburg (Siberian)	14.90	15.67	14.86
Western Europe			
Hamburg (Russian)	18.50	18.85	17.96
Copenhagen (local)	17.92	18.36	18.08
Copenhagen (Russian)	16.26	16.68	16.05
London (Russian)	16.20	17.25	16.11
London (Danish)	19.12	19.51	19.17

Sources: V.G. Tiukavkin, Sibirskaia Derevnia Nakanunie Oktiabria, (Novosibirsk, 1966), p. 369; Sbornik Statistiko-Ekonomicheskikh Svedenii po Selskomu Khoziaistvu Rossii i Inostrannikh Gosudarstv, Vol. X, (Petersburg, 1916), p. 474.

After 1900, grain production statistics for Siberia were collected and published by two government agencies: the Central Statistical Committee and the Statistical Division of the Government Administration of Agriculture and Land Use. Discrepancies between the figures of these two agencies vary up to 5%. The Central Statistical Committee collected data through the various levels of government right down to the volost administration which might be manned by peasant bureaucrats. Data from massive imperial investigations of new-settlers and old-settlers in 1911-1916 and from the Finance Ministry indicate that local statistical organs underestimated crop outputs by as much as 10% to 15%. The figures from the Government Administration of Agriculture and Land Use were based on reports of officials and correspondnets concerned with migration and often computed by multiplying either the number of households or people in a district by some estimate of average output.[1] Thus, the figures from the Central Statistical Committee given below are only the lesser of two evils.

In order to give the data for Siberian crop output in as compact and readable a form as possible, each table given below provides the relevant available data for one major

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[1] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, (Leningrad, 1968-1969), p. 321; Aziatskaia Rossiia, Vol. II, (Petersburg, 1914), p. 258; V.G. Tiukavkin, Sibirskaia Derevnia Nakanunie Oktiabria, (Novosibirsk, 1966), p.299-301.

crop in the form of five-year averages for the first fifteen years of the twentieth century and for 1913, 1916, and 1917. Equivalent figures are given for European Russia in order to facilitate comparison. The data in Tables 4 through 10 are from the same source.[2]

Table 4: Winter Rye in Siberia

Region	1901-1905	1906-1910	1911-1915	1913	1916	1917
Thousands of Acres Sown:						
Tobolsk	353	332	483	612	362	326
Tomsk	458	422	488	500	407	046
Yeniseysk	275	306	427	460	509	463
Irkutsk	302	297	303	308	335	136
Yakutsk	-	0	-	-	-	-
Siberia	1,388	1,357	1,701	1,880	1,613	1,521
European Russia	58,449	57,433	58,372	58,677	53,205	53,862
Index Numbers of Sown Area:						
Siberia	74	72	90	100	86	81
European Russia	100	98	100	100	91	92
Percentage of Sown Area Under Winter Rye:						
Siberia	15	12	11	11	10	8
European Russia	34	33	32	32	32	33
Gross Harvest of Winter Rye in Thousands of Tons:						
Tobolsk	131	105	141	193	-	-
Tomsk	133	141	165	137	-	-
Yeniseysk	90	91	47	116	-	-
Irkutsk	83	85	91	82	-	-
Siberia	437	422	444	527	-	-
European Russia	18,976	17,047	20,643	21,703	-	-

[2]N.P. Oganovsky, Sel'skoe Khoziaistvo Rossii v XX Veke, (Moscow, 1923), p.88-91, 106-107, 112-113, 116, 170-173,196-197.

Table 5: Winter Wheat in Siberia

Region	1901-1905	1906-1910	1911-1915	1913	1916	1917
Thousands of Acres Sown:						
Tobolsk	1	2	2	1	1	7
Tomsk	5	7	16	30	2	3
Yeniseysk	4	4	4	4	2	5
Irkutsk	-	-	1	6	-	2
Yakutsk	-	-	-	-	-	-
Siberia	10	13	23	41	5	41
European Russia	6,820	6,813	7,661	7,558	10,277	10,737
Index Numbers of Sown Area:						
Siberia	24	31	57	100	13	100
European Russia	90	90	101	100	136	142
Percentage of Sown Area Under Winter Wheat:						
Siberia	0	0	0	0	0	0
European Russia	4	4	4	4	6	6
Gross Harvest of Winter Wheat in Thousands of Tons:						
Tobolsk	0	1	1	0	-	-
Tomsk	2	2	5	8	-	-
Yeniseysk	1	1	1	1	-	-
Irkutsk	-	-	0	1	-	-
Siberia	3	4	7	10	-	-
European Russia	3,095	2,703	3,645	4,143	-	-

Table 6: Spring Rye in Siberia

Region	1901-1905	1906-1910	1911-1915	1913	1916	1917
Thousands of Acres Sown:						
Tobolsk	192	147	94	90	68	74
Tomsk	287	348	223	223	144	143
Yeniseysk	239	184	197	304	162	189
Irkutsk	407	264	320	338	319	246
Yakutsk	10	13	-	-	-	27
Siberia	1,014	956	835	954	720	759
European Russia	478	429	435	438	713	489
Index Numbers of Sown Area:						
Siberia	106	100	87	100	75	80
European Russia	109	98	99	100	163	112
Percentage of Sown Area Under Spring Rye:						
Siberia	11	8	5	5	4	4
European Russia	0	0	0	0	0	0
Gross Harvests of Spring Rye in Thousands of Tons:						
Tobolsk	54	35	20	22	-	-
Tomsk	75	110	66	78	-	-
Yeniseysk	71	52	53	84	-	-
Irkutsk	73	76	70	74	-	-
Siberia	272	273	210	259	-	-
European Russia	114	99	117	146	-	-

Table 7: Spring Wheat in Siberia

Region	1901-1905	1906-1910	1911-1915	1913	1916	1917
Thousands of Acres Sown:						
Tobolsk	1,238	1,416	1,862	1,915	2,183	2,209
Tomsk	1,724	2,616	4,663	4,968	5,005	5,788
Yeniseysk	268	336	387	405	478	569
Irkutsk	113	108	137	161	173	177
Yakutsk	4	4	-	-	-	6
Siberia	3,348	4,480	7,049	7,471	7,846	8,762
European Russia	31,594	34,757	36,680	37,152	26,324	24,004
Index Numbers of Sown Area:						
Siberia	45	60	94	100	105	117
European Russia	85	94	99	100	77	65
Percentage of Sown Area Under Spring Wheat:						
Siberia	36	40	45	46	48	48
European Russia	18	20	20	20	16	15
Gross Harvest of Spring Wheat in Thousands of Tons:						
Tobolsk	397	404	486	528	-	-
Tomsk	512	920	1,340	1,557	-	-
Yeniseysk	79	104	109	113	-	-
Irkutsk	26	32	36	42	-	-
Siberia	1,014	1,460	1,970	2,241	-	-
European Russia	8,210	8,780	9,437	12,885	-	-

Table 8: Oats in Siberia

Region	1901-1905	1906-1910	1911-1915	1913	1916	1917
Thousands of Acres Sown:						
Tobolsk	1,041	1,227	1,268	1,200	1,661	1,716
Tomsk	975	1,628	2,744	2,903	2,522	3,071
Yeniseysk	214	280	335	330	380	464
Irkutsk	186	219	266	260	181	194
Yakutsk	2	3	-	-	-	4
Siberia	2,418	3,357	4,613	4,693	4,748	5,474
European Russia	33,062	33,304	33,278	33,349	31,742	31,828
Index Numbers of Sown Area:						
Siberia	52	72	98	100	101	117
European Russia	99	100	100	100	95	95
Percentage of Sown Area Under Oats:						
Siberia	26	30	30	28	29	30
European Russia	19	19	18	18	19	19
Gross Harvest of Oats in Thousands of Tons:						
Tobolsk	333	331	338	383	-	-
Tomsk	303	632	887	1,068	-	-
Yeniseysk	72	98	97	112	-	-
Irkutsk	51	72	63	75	-	-
Siberia	759	1,134	1,386	1,638	-	-
European Russia	10,604	10,752	11,447	13,901	-	-

Table 9: Barley in Siberia

Region	1901-1905	1906-1910	1911-1915	1913	1916	1917
Thousands of Acres Sown:						
Tobolsk	91	92	132	150	149	148
Tomsk	101	172	312	339	234	261
Yeniseysk	31	39	54	56	49	64
Irkutsk	49	53	61	65	77	79
Yakutsk	18	18	-	-	-	53
Siberia	290	374	559	610	561	608
European Russia	16,098	17,921	20,160	20,567	19,311	18,560
Index Numbers of Sown Area:						
Siberia	48	61	92	100	92	100
European Russia	78	87	98	100	94	90
Percentage of Sown Area Under Barley:						
Siberia	3	3	4	4	3	3
European Russia	9	10	11	11	12	11
Gross Harvest of Barley in Thousands of Tons:						
Tobolsk	31	32	41	48	-	-
Tomsk	30	65	101	122	-	-
Yeniseysk	9	12	16	21	-	-
Irkutsk	16	9	20	23	-	-
Siberia	86	118	178	214	-	-
European Russia	5,270	6,266	7,049	8,746	-	-

Table 10: All Field Crops in Siberia

Region	1901-1905	1906-1910	1911-1915	1913	1916	1917
Thousands of Acres Sown:						
Tobolsk	3,148	3,372	4,000	4,138	4,596	4,635
Tomsk	3,928	5,656	9,030	9,569	8,930	10,425
Yeniseysk	1,110	1,230	1,504	1,659	1,690	1,884
Irkutsk	973	983	1,139	1,190	1,148	1,075
Yakutsk	36	40	-	-	-	91
Siberia	9,183	11,269	15,660	16,546	16,225	18,234
European Russia	172,274	175,875	183,269	185,201	167,597	164,968
Index Numbers of Sown Area:						
Siberia	56	68	95	100	99	110
European Russia	93	95	99	100	90	89
Gross Harvest of Grain Crops in Thousands of Tons:						
Tobolsk	964	915	1,033	1,184	-	-
Tomsk	1,116	1,929	2,610	3,020	-	-
Yeniseysk	330	365	331	455	-	-
Irkutsk	251	278	284	301	-	-
Siberia	2,661	3,487	4,259	4,960	-	-
European Russia	50,265	50,059	56,922	66,719	-	-

There were, of course, other field crops cultivated in Siberia; the most important of these were buckwheat, millet, corn, peas, lentils, beans, potatoes, flax, hemp, and sunflower seeds. However, none of these crops ever covered more than 2% of the sown area in Siberia before World War I.[3] Hence, they are considered of minor importance and figures for them have been omitted.

Comparative data on average grain prices in Siberia are not available for the years preceding 1901. Grain prices in Siberia were highly volatile over time (changing with the season of the year and the magnitude of theyear's harvest) and highly variable from district to district since transport costs could be a large share of the delivered prices. The following tables give average prices for grain (rye, wheat, oats, and barley) in each gubernia of Siberia and for various regions of Russia (including Siberia) taken as a whole. The price differentials are extremely impressive when one notes that the figures have been chosen to minimize all price differentials except those due to transport costs. Averages for each season are given separately; thus, differences due to seasonal variations of prices across regions are eliminated. The averages are for five-year periods, thus, eliminating differences due to good and bad harvests. The averages are for large areas (gubernia or larger), thus,

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[3]Oganovsky, p. 116.

ignoring local price differences which must have been considerable. So, whatever price differences remain must be due all or mostly to transport costs; otherwise, arbitrage would have closed a gap which on average lasted at least five years between two regions of gubernia size or larger.

Table 11: Average Prices in Kopeks Per Pood (1 pood = 36.113 pounds) for Winter Rye in Siberia and other Regions of Russia

District	Season	1901-1905	1906-1910	1911-1915
Tobolsk	Spring	58	63	81
	Fall	52	63	75
Tomsk	Spring	76	60	67
	Fall	55	54	61
Yeniseysk	Spring	58	66	65
	Fall	60	60	62
Irkutsk	Spring	?	73	91
	Fall	?	68	81
Western Siberia	Spring	64	64	76
	Fall	56	60	66
Central Agricultural Region of European Russia	Spring	59	88	89
	Fall	61	83	88
Central Industrial Region of European Russia	Spring	76	107	111
	Fall	74	98	110

(Table 11, Continued)

District	Season	1901-1905	1906-1910	1911-1915
Northern Caucausus	Spring	60	82	82
	Fall	56	78	73
Western Siberia	Spring	.84	.60	.68
	Fall	.76	.61	.60
Central Industrial Region				

Source: L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p. 154, 387.

Table 12: Average Prices in Kopeks Per Pood (1 pood = 36.113 pounds) for Spring Wheat in Siberia and Other Regions

District	Season	1901-1905	1906-1910	1911-1915
Tobolsk	Spring	76	81	105
	Fall	68	77	91
Tomsk	Spring	82	77	90
	Fall	66	67	73
Yeniseysk	Spring	94	91	100
	Fall	94	84	91
Irkutsk	Spring	?	100	90
	Fall	?	100	68
Western Siberia	Spring	84	86	103
	Fall	76	85	92
Central Agricultural Region	Spring	78	105	111
	Fall	65	100	101
Central Industrial Region	Spring	101	139	147
	Fall	95	120	141
Northern Caucausus	Spring	79	104	101
	Fall	71	101	94
Western Siberia	Spring	.83	.62	.70
	Fall	.80	.71	.65

Central Industrial Region

Source: L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967),p.154, 387.

Table 13: Average Prices in Kopeks Per Pood (1 pood = 36.113 pounds) for Oats in Siberia and Other Regions

District	Season	1901-1905	1906-1910	1911-1915
Tobolsk	Spring	47	53	77
	Fall	45	48	65
Tomsk	Spring	48	50	58
	Fall	45	41	46
Yeniseysk	Spring	44	53	52
	Fall	50	46	55
Irkutsk	Spring	?	64	80
	Fall	?	62	79
Western Siberia	Spring	46	51	68
	Fall	47	48	67
Central Agricultural Region	Spring	57	72	83
	Fall	54	59	78
Central Industrial Region	Spring	68	86	109
	Fall	58	73	102
Northern Caucausus	Spring	53	66	77
	Fall	41	60	70
Western Siberia	Spring	.68	.59	.62
	Fall	.81	.66	.66

Central Industrial Region

Source: L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p.154, 387.

Table 14: Average Prices in Kopeks Per Pood (1 pood = 36.113 pounds) for Barley in Siberia and Other Regions

District	Season	1901-1905	1906-1910	1911-1915
Tobolsk	Spring	42	57	81
	Fall	49	54	75
Tomsk	Spring	?	53	60
	Fall	50	47	50
Yeniseysk	Spring	40	55	60
	Fall	52	51	59
Irkutsk	Spring	?	67	77
	Fall	?	60	74
Western Siberia	Spring	41	57	69
	Fall	50	53	63
Central Agricultural Region	Spring	61	80	88
	Fall	58	71	84
Central Industrial Region	Spring	75	98	114
	Fall	68	83	109
Northern Caucausus	Spring	50	64	72
	Fall	47	58	62
Western Siberia	Spring	.55	.58	.61
	Fall	.74	.64	.58

Central Industrial Region

Source: L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p.154, 387.

Table 15: Export of Siberian Grain Westward by Rail in Thousands of Tons

Year	Thousands of Tons	Year	Thousands of Tons
1897	246.6	1908	991.8
1898	293.4	1909	925.2
1899	246.6	1910	534.6
1900	194.4	1911	691.2
1902	50.4	1912	1,004.4
1903	309.6	1913	1,074.6
1904	428.4	1914	822.6
1905	446.4	1915	1,463.4
1906	703.8	1916	964.8
1907	1,042.2	1917	639.0

Source: L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nahhalo XX, (Novosibirsk, 1967), p.148.

The gross domestic consumption of Siberian grain should be easily calculable from information already contained in Tables 10 and 15. Five-year totals of Siberian grain consumption are computed in the table given below.

Table 16: Gross Siberian Grain Consumption Computed as a Residual of Production Minus Exports in Thousands of Tons

Years	Average Gross Production	Average Export	Per Cent Exported	Residual
1901-1905	2,661	247	9%	2,720*
1906-1910	3,487	840	24%	2,647
1911-1915	4,259	1,011	24%	3,248
1913	4,960	1,075	22%	3,885

*Note: Includes imports of 306,000 tons of grain from European Russia in 1901-1902.

There are, of course, all sorts of qualifications which must be applied to rough-and-ready figures like those computed in Table 16. The figures are only for gross production and for grain shipped westward from Siberia by rail; thus, the residuals include seed grain, grain used to feed both people and animals (which might be ultimately exported as meat and hides), grain processed in Siberia into flour (much of which was exported) or alcoholic drink, and grain shipped out of Siberia by water or wagon. There are also the usual problems of accuracy with Siberian statistics. If the authorities couldn't even count the peasants themselves, how could they accurately count the bounty of their harvests? Nevertheless, the figures in Table 16 look reasonable and are as accurate as one could hope for.

Oddly enough, while I have computed domestic grain needs above as the residual of gross output minus exports, most works I have consulted attempt to estimate domestic needs and derive export totals as a residual of output minus domestic needs. This way of arriving at an export estimate is subject to error due to the high variability of estimates for consumer needs. Thus, Treadgold figures that an average harvest of 50 poods per desiatina from 6 million desiatinas would yield on average 300 million poods of grain per year. He accepts 15 poods (541 pounds) per person per year as consumption grain needs and arrives at an average exportable surplus of 150

million poods (2.7 million tons).[4] Yet the export figures above exceeded half that amount only for one year, 1915. In contrast to Treadgold's estimate, one publication of the Academy of Sciences computed the average grain requirements of the city of Irkutsk between 1851 and 1899 at 19 poods (685 pounds) per resident per year.[5] Kaufman, the expert on Siberian agriculture of the period, figured annual grain needs across Siberia at 15 to 25 poods (541 to 901 pounds) per person. Chayanov estimated per person grain requirements at 18 poods (649 pounds) of grain and potatoes per year. Government officials of the period estimated grain needs per Russian citizen in Siberia including animal fodder at 28 poods (1,009 pounds) per person; yet a native required, according to official estimates, only 7 poods (253 pounds) of grain per year. Goriushkin separates animal and human needs. According to his estimate, a human being in Siberia consumed 20 poods (720 pounds) of grain per year while each head of livestock required 8 to 10 poods (289 to 360 pounds) of grain per year. Tiukavkin, on the other hand, discovered that grain consumption per person was closely

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[4] D.W. Treadgold, The Great Siberian Migration, (Princeton, 1957), p. 176.

[5] Predposylki Oktiabrskoi Revoliutsii v Sibiri. Materialy po Istorii Sibiri: Sibir Perioda Kapitalizma. Vipusk 1, (Novosibirsk, 1964), p. 65.

correlated to peasant class. Thus, poor households consumed only 12 to 16 poods (432 to 577 pounds) per person per year. Middle-class peasant households consumed 20 to 23 poods (720 to 828 pounds) of grain per member per year and kulak households consumed 22 to 27 poods (792 to 973 pounds) of grain consumption per person in peasant households at 21 poods (756 pounds) per year.[6] Before one laments the poor diet of Siberian lower class peasants, one should remember that peasants were divided into classes according to sown area; thus, a good part of that extra grain "consumption" enjoyed by the kulak household was simply used to seed a larger area. By contrast, the average grain requirement per person per year in European Russia was only 12 poods (432 pounds), and in the United States it was a comparatively minuscule 7.2 poods (260 pounds).[7] The whole point of this litany of per person grain requirements is to indicate by their high variability that they are little more than educated guesses. Yet they form the basis from which some investigators derive figures for both the share of Siberian grain marketed and the grain export capacity of the region. Changing the per person grain norm by only one pood (36.113 pounds) changes the share of total grain which leaves the agricultural sector--that is, grain sold by peasants to

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[6]V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria, (Novosibirsk, 1966), p. 336.

[7]Tiukavkin, p. 337.

non-peasants--by between 2% and 3%. There are no records of grain sales between peasants unless the grain happened to cross district boundaries. So, almost any estimates of the commercial share of Siberian grain output should be accepted only as educated guesses.

Table 17: Prices of a Live Steer Ready for Slaughter in Rubles

District	Season	1901-1905	1906-1910
Tobolsk	Spring	34	39
	Fall	27	33
Tomsk	Spring	30	32
	Fall	24	29
Yeniseysk	Spring	26	36
	Fall	25	30
Irkutsk	Spring	-	46
	Fall	-	46
Industrial Region of European Russia	Spring	49	58
	Fall	44	51
50 gubernias of European Russia	Spring	60	70
	Fall	51	65

Source: Sbornik Statistiko-Ekonomicheskikh Svedenii po Sel'skomu Khoziaistvu Rossii i Inostrannikh Gosudarstv, (Petersburg), Vol. VI, 1912, p. 456-457, 471, 475; Vol. X, 1916, p. 501, 508-509.

Table 18: Prices for a Sheep in Rubles

District	Season	1901-1905	1906-1910	1911-1915
Tobolsk	Spring	3.20	3.68	4.63
	Fall	3.51	3.35	4.59
Tomsk	Spring	3.49	3.06	3.87
	Fall	3.35	2.94	3.37
Yeniseysk	Spring	3.87	3.40	3.93
	Fall	3.51	3.31	3.84
Irkutsk	Spring	-	5.46*	6.34
	Fall	-	5.40*	5.94
Industrial Region of European Russia	Spring	4.67	5.66	-
	Fall	3.94	5.28	-
50 gubernias of European Russia	Spring	3.87	5.39	-
	Fall	3.62	4.90	-

Source: Sbornik Statistiko-Ekonomicheskikh Svedenii po Sel'skomu Khoziaistvu Rossii i Inostrannikh Gosudarstv, (Petersburg), Vol. VI, 1912, p. 458-459, 471, 475; Vol.X, 1916, p. 501, 508-509.

Table 19: Prices for an Unfattened Pig in Rubles

District	Season	1901-1905	1906-1910	1911-1915
Tobolsk	Spring	5.34	7.73	9.63
	Fall	5.27	7.78	9.14
Tomsk	Spring	4.64	8.21	8.38
	Fall	5.79	7.61	8.59
Yeniseysk	Spring	6.82	8.76	9.21
	Fall	7.62	8.32	8.43
Irkutsk	Spring	-	13	12.29
	Fall	-	12.56	12.23
Industrial Region of European Russia	Spring	11.58	14.52	-
	Fall	11.69	15.30	-
50 gubernias of European Russia	Spring	10.39	13.87	-
	Fall	11.03	14.10	-

Source: Sbornik Statistiko-Ekonomicheskikh Svedenii po Sel'skomu Khoziaistvu Rossii i Inostrannikh Gosudarstv, (Petersburg), Vol. VI, 1912, p. 458-459, 471, 475; Vol.X, 1916, p.501, 508-509.

Table 20: Average Prices for a Pood of Meat (1 pood = 36.113 pounds)

Districts	Years	Beef	Mutton	Pork
Tobolsk	1901-1905	2.23	2.14	3.04
	1906-1910	2.65	2.46	3.31
Tomsk	1901-1905	1.98	1.91	2.83
	1906-1910	2.58	2.31	3.42
Yeniseysk	1901-1905	-	-	-
	1906-1910	2.96	2.58	3.36
Irkutsk	1901-1905	-	-	-
	1906-1910	3.91	4.04*	5.15*
Zabaikal	1901-1905	-	-	-
	1906-1910	3.96	3.78*	5.47*
Industrial Region of European Russia	1901-1905	3.39	3.24	4.21
	1906-1910	4.40	4.22	5.44
50 gubernias	1901-1905	3.11	2.90	3.89
	1906-1910	4.04	3.75	5.00

Source: Sbornik Statistiko-Ekonomicheskikh Svedenii po Sel'skomu Khoziaistvu Rossii i Inostrannikh Gosudarstv, Vol. VI, (Petersburg, 1912), p. 462-463, 482-483, 486, 490-491.

Table 21: Average Prices for a Pood of Fat

District	Years	Beef Fat	Sheep Fat	Pork Fat
Tobolsk	1901-1905	3.93	3.73	5.35
	1906-1910	4.52	4.84	6.15
Tomsk	1901-1905	3.72	4.59	4.83
	1906-1910	4.23	4.40	6.34
Yeniseysk	1901-1905	4.41	4.85	6.43*
	1906-1910	4.63	4.41	6.42
Irkutsk	1901-1905	-	-	-
	1906-1910	5.42	5.85	7.60*
Zabaikal	1901-1905	-	-	-
	1906-1910	5.17	6.10*	-
Industrial Region of European Russia	1901-1905	4.93	5.10	5.78
	1906-1910	6.08	6.36	7.14
50 gubernias of European Russia	1901-1905	4.85	4.91	6.45
	1906-1910	5.85	5.86	7.96

Source: Sbornik Statistiko-Ekonomicheskikh Svedenii po Sel'skomu Khoziaistvu Rossii i Inostrannikh Gosudarstv, Vol. VI, (Petersburg, 1912), p. 482-483, 486, 490-491.

The starred items in the above tables are the nine instances in which the price for an animal, its meat, or its fat was higher in some district of Siberia than in either the industrial region of European Russia or the 50 gubernias

of European Russia taken as a whole. Not one of these nine cases involves Western Siberia, which was the main livestock exporting region of Siberia. It might also be noted that there are only ten cases in which prices declined over time--all of them in Siberia. Five of the cases involve prices for live sheep; two of the cases involve the prices for a live pig; two involve the price of sheep fat and one involves the price of pork fat. A general inflationary trend is clear from the tables and, to repeat, the few price declines all occur in Siberia. Finally, the price differentials leave no doubt that Siberia had a comparative advantage over European Russia in the production of livestock and livestock products. The rather large differentials also suggest that transport costs even for animals and animal products out of Siberia were considerable.

Table 22: Estimates for Average Annual Meat Exports from Siberia for Various Years

Years	Estimates in Tons	Sources
"before 1896"	1,800	1, p. 169 2, p. 65
1900	45,000	1, p. 169
1900	45,000	2, p. 66
1900	18,000[a]	3, p. 176
1900	54,000	4, p. 53
1900-1914	36,000[b]	5, p. 45
1900-1904	48,402[c]	1, p. 386
1905-1909	39,600[b]	5, p. 45
1907	48,510[d]	1, p. 168
1908	44,406[d]	1, p. 168
1909	48,420[d]	1, p. 168
1909-1914	61,200[b]	5, p. 45
1910	54,846[d]	1, p. 168
1910	73,800	4, p. 53
1910-1914	58,800[b]	5, p. 45
1911	73,800	4, p. 53
1911	79,200[e]	3, p. 176
1911	53,406[d]	1, p. 168
1913-1914	69,480[c]	1, p. 386
"eve of War"	49,914[d]	1, p. 168
"eve of War"	50,400[d]	6, p. 363
1917	63,000	2, p. 65

[a]Refers to all livestock products and valued at 13.4 million rubles.

[b]According to [6, p. 361], this estimate neglected meat which came from points east of Novonikolaevsk.

[c]Includes meat, fat, fowl, and game.

[d]From Western Siberia only.

[e]Refers to all livestock products and valued at 70.8 million rubles.

Sources to Table 22:

1. L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967)

2. L.M. Goriushkin, Sotsial'no-Ekonomicheskie Predposylki Sotsialisticheskoi Revoliutsii v Sibirskoi Derevnie, (Novosibirsk, 1962).

3. Osobennosti Agrarnogo Stroia Rossii v Period Imperializma, (Moscow, 1962).

4. P.M. Golovachev, Ekonomicheskaia Geografia Sibiri.

5. S.S. Bazikin, "Sel'skoe Khoziaistvo Sibiri i Zaselenie," Severnaia Aziia, 1929, #3.

6. V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria, (Novosibirsk, 1966).

Table 23: Estimates for Average Annual Exports of Live Steers from Western Siberia

Years	Number Exported	Years	Number Exported
1907	43,717	1910	105,923
1908	54,344	1911	90,609
1909	56, 362	"eve of War"	70,190

Source:
L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p. 168.

Table 24: Figures for Average Annual Export of Other Animal Products from Western Siberia in Tons

Year	Fats and Oils	Hides and Skins	Wool	Dressed Fowl
1900		4,518	4,176	378
1900-1904		7,110*		
1907	3,438			
1908	5.706			
1909	6,228	8,928	9,720	1,890
1910	6,930			
1911	6,156			
"eve of War"	5,688			
1913-1914		19,530*	16,596*	

*Refers to exports from all of Siberia.

Source: L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p. 168-169, 386.

Data Relating to Agricultural Inputs

The following table gives prices charged for agricultural equipment ranging from the most basic to the most complex for various years. The last column converts the prices into working days for a male agricultural laborer assuming a daily wage of 80 kopeks per day. This is a reasonable figure since daily wages for a male agricultural worker fed by his employer

ranged from 64 to 97 kopeks per day for 1901 to 1910 depending on the season, district, and year of employment.[8]

Table 25: Prices Charged for Various Pieces of Agricultural Capital in Siberia and Their Equivalent in Days of Labor at 80 Kopeks Per Day

Equipment	Years	Price in Rubles	Equivalent Cost in Days of Labor
Working horse	Up to 1903	30-35	37.5-43.8
Working horse	1907-1910	40-70	50-87.5
Cow	Up to 1903	20-25	25-31.2
Cow	1907-1910	25-40	31.2-50
McCormick binder	1906-1908	387	483.8
McCormick reaper without detachable front	1906-1908	183	228.8
McCormick mower	1906-1908	134	167.5
Scythe	1908-1911	0.40-0.41	0.5
Pitchfork	1908-1911	0.40-0.50	0.5-0.6
Sickle	1908-1911	0.31-0.50	0.4-0.6
Ax	1908-1911	0.90-1.00	1.1-1.2
Single-plowshare plow	1908-1911	21.70-22.20	27.1-27.8
Disc seeder	1912	230	287.5
Horse-drawn rake	1912	70	87.5
Harvester	1912	170	212.5

Source: L.F. Skliarov, Pereselenie i Zemleustroistvo v Sibiri v Gody Stolypinskoi Agrarnoi Reformy, (Leningrad, 1962), p. 356, 360, 361; L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p. 119.

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[8] Sbornik Statistiko-Ekonomicheskikh Svedenii po Sel'skomu Khoziaistvu Rossii i Inostrannikh Gosudarstv, Vol. V, (Petersburg, 1911), p. 484-485; Vol. X, (Petersburg, 1916), p. 530-532.

With the advent of war, prices for agricultural equipment, as for everything else, inflated dramatically. Although no indexes are available to me, an indication of the seriousness of the price rise is given by the following observations. In June of 1915, an agronomist working with the Siberian Cossacks noted an increase in the price for agricultural equipment of "fifty per cent or even more" over the pre-war level. The Chief Office of Agricultural Storehouses of Siberia reported that spare parts for agricultural machinery were selling in 1917 at 220% of their 1914 prices.[9]

Before presenting summary tables and graphs of the available statistics on livestock totals in Siberia over time, some warning about the accuracy of these statistics is in order.

To the Siberian peasant as to all Russian peasants, surveys of his possessions were conducted only to facilitate taxation, so it was not uncommon for the Siberian peasant to use every means at his disposal to hide his livestock from the census-takers--including driving them into the woods so they could not be counted. Surveys of the livestock of the native nomads were even conducted in the dead of winter since the inclement weather forced the nomads to encamp in a limited number of sheltered areas and since turning their

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[9]L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p. 119.

stock loose at that time would often mean that they would die. Surveys were conducted by three basic groups: the Veterinary Administration and non-governmental agencies such as the Geographical Society; various civil authorities including the Migration Administration and the Bureau of Agriculture and Land Utilization; and military authorities which counted horses and draft animals which might be requisitioned in case of military emergency. These three groups are listed in the rough order of the size of their estimates of livestock totals. That is, in cases in which their statistics overlap, the Veterinary Administration and private agencies tended to give the lowest totals. Civil authorities gave intermediate totals and military authorities generally gave the highest estimates of livestock totals. There are a number of possible reasons for this state of affairs. Representatives of private agencies might have been more naive in believing the numbers given them by the peasants they surveyed, while the civil and military authorities may have made allowances for the wily peasant's understatement of his assets. Alternatively, civil and military authorities with their continuous interest in and involvement with the peasants under their jurisdiction may simply have been more familiar with the households in their districts and their assets. Then too, the military authorities were interested only in animals which could be used as mounts or in transporting supplies. They did not need to expend any

effort in counting dairy cows, sheep, goats, pigs, or other such stock. On the other hand, military and civil census-takers may have been under pressure to inflate their figures.

Deciding which estimate to accept under these circumstances is always difficult. Fortunately, cases of overlapping figures are few and most cases of conflicting figures involve very small differences. In the few remaining cases in which two sources give quite different figures, the figure most consistent with other figures for the years immediately before and after is included in the table while the alternative figure is relegated to a footnote. One further note of caution, large changes in livestock totals from year to year were not uncommon. A sudden drop in livestock totals might be due to an exceptionally heavy slaughter of mature stock or to the effects of an epidemic. Sudden increases in stock, on the other hand, might be due to light slaughter or to natural increase. The point is that large up-and-down fluctuations over time are not sufficient reason to reject figures for livestock totals. Totals spanning more than one year are annual averages for the years included.

Table 26: Livestock in Siberia and Districts for Various Years in Numbers of Animals

Year	Siberia (Far East included)	Far East	Tobolsk gubernia	Tomsk gubernia
1898-1900	16,100,000	500,000		
1904	11,500,000			
1910-1912	18,100,000	700,000		
1911			2,452,838	7,642,045
1916	38,500,000			
1917	31,293,000	1,000,000		

Year	Yeniseysk gubernia	Irkutsk gubernia	Zabaikal oblast'	Yakutsk oblast'
1898-1900			3,000,000	
1910-1912			3,400,000	
1911	1,853,854	954,578	2,839,148	330,164
1917			3,800,000	

Year	Amur oblast'	Primorskaia oblast'
1911	236,556	377,161

Sources: Aziatskaia Rossiia, Vol. I, (Petersburg, 1914), p. 318; V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria (Novosibirsk, 1966), p. 360; Osobennosti Agrarnogo Stroia Rossii v Period Imperializma, (Moscow, 1962), p. 170; George Katkov, Erwin Oberlander, Nikolaus Poppe, Georg Von Rauch, editors, Russia Enters the Twentieth Century, 1894-1917, (London, 1971), p. 146; V.F. Borzunov, Vliianie Transsibirskoi Magistraly Na Razvitie Selskogo Khoziaistva Sibiri i Dalnego Vostoka v Nachale XX Veka, p. 170.

Figure III.A.1: Total Livestock in Siberia and Districts
(Based on Appendix Table 26.)

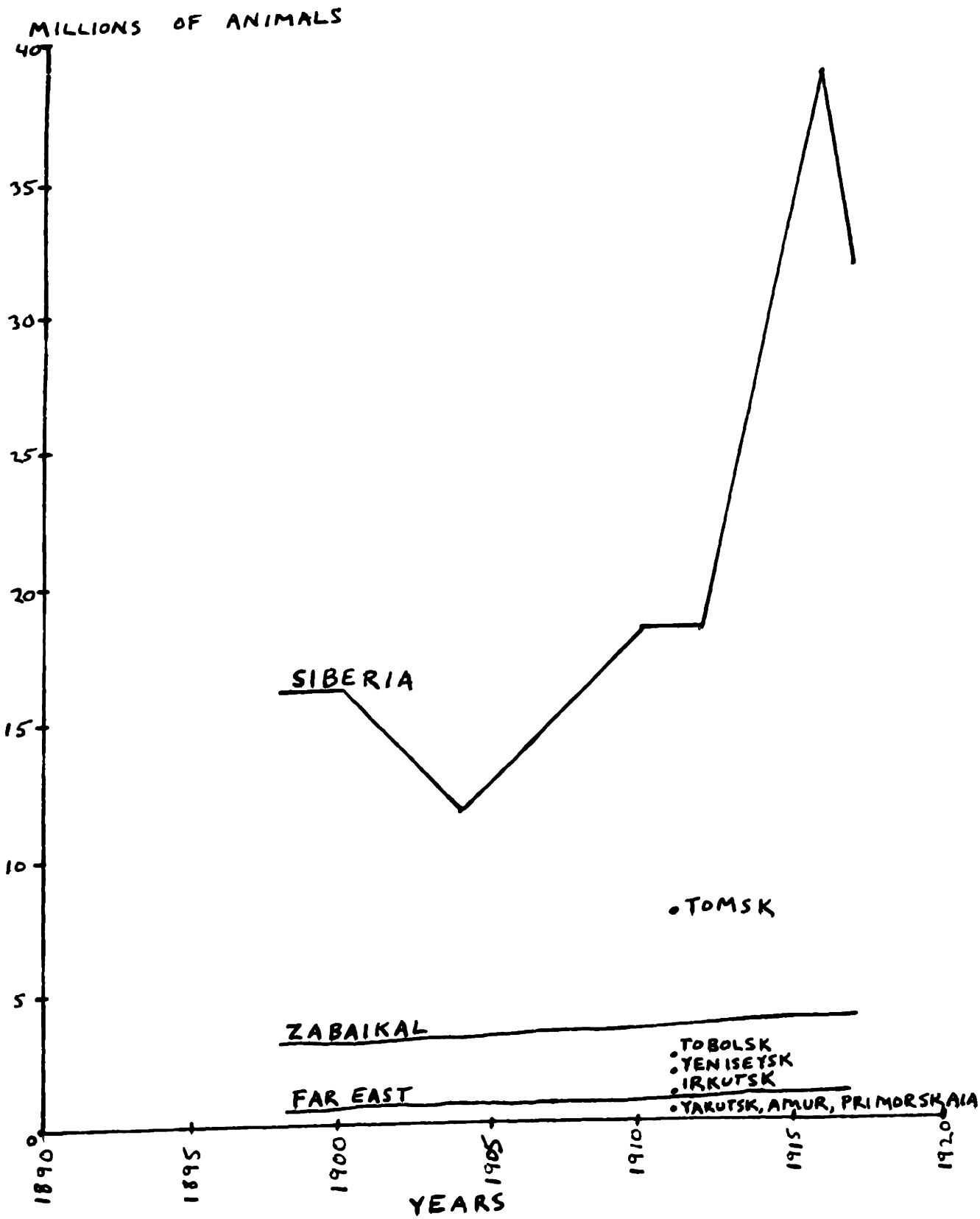

Table 27: Horses in Russia, European Russia, Siberia and Its Various Districts

Year	RSFSR**	Russia	European Russia (50 gubernias)	Siberia
1860				1,974,000
1890			16,288,000	
1891-1900			15,989,800	
1895				3,657,600
1897				5,000,000
1900			18,195,500	
1901			19,681,000	
1901-1906			18,506,600	
1908		32,637,000	20,598,000	4,328,101
1909		33,720,000	21,321,000	4,487,036
1910				4,697,200
1912	26,648,900		18,509,800	3,932,200
1913			21,605,900	
1916	31,021,600		20,292,000	4,888,400
1917	28,853,100		19,953,800	4,774,300*

*Another figure found was 6,924,000.

**Figures for "RSFSR" are for the areas which became the RSFSR in 1925.

(Table 27 Continued)

Year	Western Siberia	Eastern Siberia	Tobolsk	Tomsk
1897	3,667,000	1,333,000	736,000	2,308,000
1901	2,317,600			
1905			847,872	1,503,312
1906			854,874	1,516,491
1907			794,242	1,825,571
1908			771,824	1,901,290
1909			807,875	2,029,070
1910			847,390	2,217,345
1911			749,672	2,173,733
1912			719,249	2,315,444
1913	2,917,500		856,809	2,480,633
1914			881,721	2,714,206
1916			1,174,700	2,620,900
1917	5,136,000	1,788,000	1,063,300	2,641,200

Year	Yeniseysk	Irkutsk	Zabaikal	Yakutsk
1897	471,000	234,000	628,000	
1905	446,217	217,177		
1906	439,981	221,517		
1907	488,512	234,509		
1908	489,118	239,935		115,386
1909	491,573	247,258	592,887	110,303
1910	468,939	252,920		
1911	494,157	287,518	591,588	88,138

(Table 27 Continued)

Year	Yeniseysk	Irkutsk	Zabaikal	Yakutsk
1912	526,485	255,762		
1913	544,136	250,692		
1914	541,183	227,795		
1916	600,100	366,100		
1917	597,600*	345,600**	606,000	126,600

*Another estimate given was 898,000.

**Another estimate found was 284,000.

Year	Amur	Primorskaia
1908	93,416	129,191
1909	97,382	110,688
1911	101,206	109,516

Sources: Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol.III, (Leningrad, 1968-1969), p. 203; L.F. Skliarov, Pereselenie i Zemleustroistvo v Sibiri v Gody Stolypinskoi Agrarnoi Reformy, (Leningrad, 1962), p. 490; Aziatskaia Rossiia, Vol. I, (Petersburg, 1914), p. 318; Sbornik Statistiko-Ekonomicheskikh Svedenii po Selskomu Khoziaistvu Rossii i Inostrannikh Gosudarstv, Vol. IV, (Petersburg, 1910), p. 197, 214; Vol. V, (Petersburg, 1911), p. 235, 253; V.G. Tiukavkin, Sibirskoe Derevnia Nakanune Oktiabria, (Novosibirsk, 1966), p. 356; L.M. Goriushkin, Sibirskoe Krestianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p. 381-382; N.P. Oganovsky, Selskoe Khoziaistvo Rossii v XX Veke, (Moscow, 1923), p. 213-215,218; I.N. Novidov, Razvitie Selskogo Khoziaistva Sibiri v 60-90kh Godakh XIX Veka, (Omsk, 1965), p. 127.

Figure III.A.2: Horses in Siberia and Districts
(Based on Appendix Table 27.)

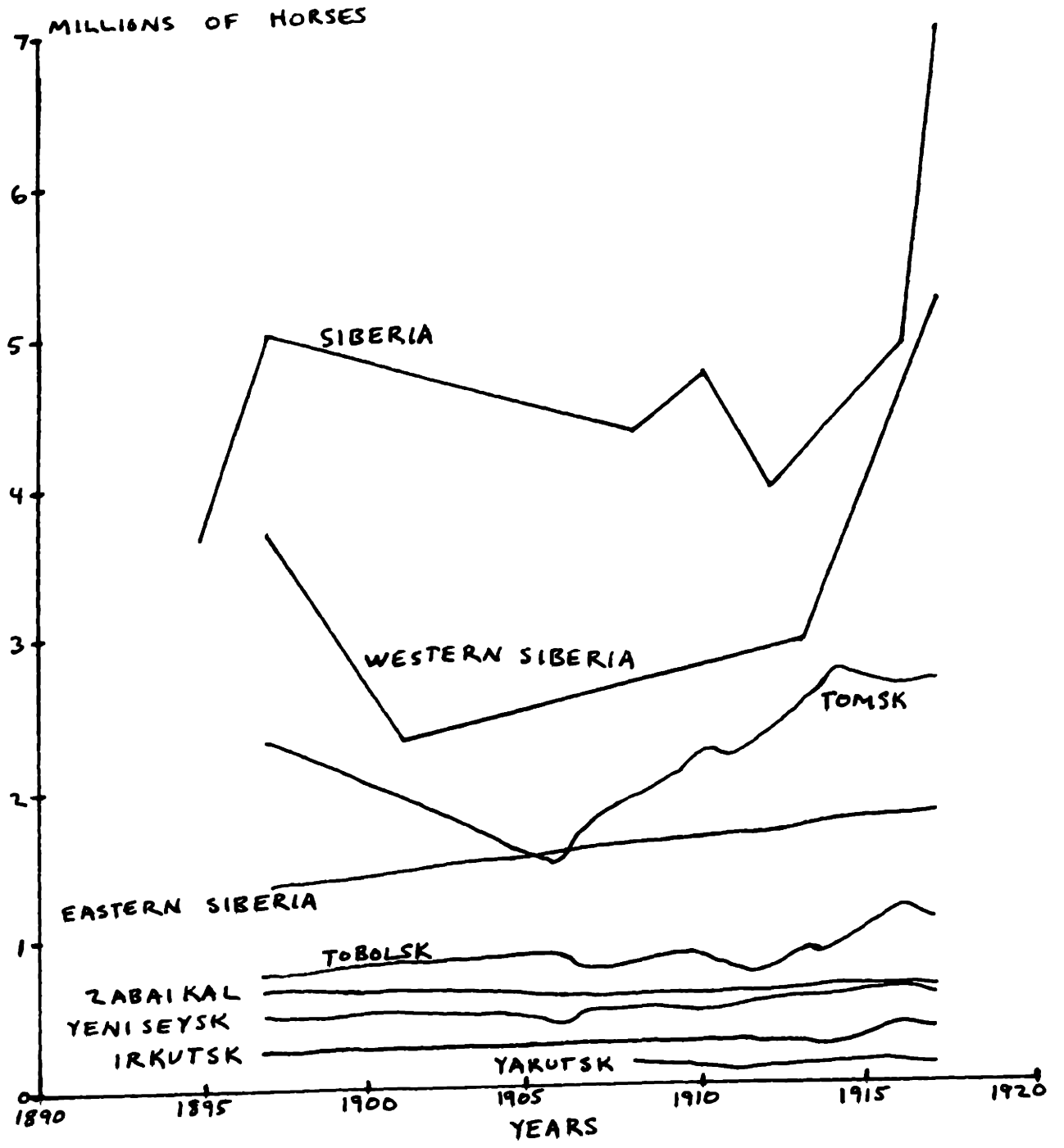

Table 28: Cattle in Russia, Siberia, and Its Districts

Year	RSFSR	Russia	European Russia (50 gubernias)	Siberia
1860				2,082,000
1895				4,050,600
1897				5,681,000
1901			30,339,500	
1908		48,973,000	29,687,000	5,369,868
1909		50,241,000	30,492,000	5,753,553
1910				5,970,800
1913			32,027,100	
1916	50,206,900		33,427,100	7,654,000
1917	48,195,300		32,239,400	7,136,700*

*Other estimate: 9,782,000

Year	Western Siberia	Eastern Siberia	Tobolsk	Tomsk
1897	3,764,000	2,017,000	986,000	2,325,000
1901	2,407,500			
1905			1,248,898	1,790,608
1906			1,211,763	1.742,881
1907			1,018,312	2.105,992
1908			979,458	2,153,180
1909			1,052,167	2,304,621
1910			1,154,570	2,436,882
1911			900,201	2,469,049

(Continued)

(Table 28 Continued)

Year	Western Siberia	Eastern Siberia	Tobolsk	Tomsk
1912			933,564	2,477,164
1913			1,127,834	2,776,114
1914			1,275,905	2,866,323
1916			2,226,300	3,399,000
1917	7,141,000*	2,651,000	1,859,000	3,384,900

*Note that the figure for Western Siberia is larger than for the whole of Siberia.

Year	Yeniseysk	Irkutsk	Zabaikal	Yakutsk
1897	298,000	314,000	1,405,000	
1905	500,706	327,943		
1906	501,243	342,123		
1907	483,842	335,558		
1908	490,946	338,349	888,402	321,501
1909	524,936	368,754	922,557	333,929
1910	488,523	375,822		
1911	500,139	354,622	1,003,145	241,674
1912	527,167	353,771		
1913	563,425	347,563		
1914	562,154	294,547		
1916	756,300	793,300		
1917	736,300*	677,100**	1,392,000	479,400

*Other estimate: 735,000.

**Other estimate: 524,000.

(Continued)

(Table 28 Continued)

Year	Amur	Primorskaia
1908	66,019	132,013
1909	83,361	163,228
1911	75,231	171,168

Sources: Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, (Leningrad, 1968-1969), p. 203; L.F. Skliarov, Pereselenie i Zemleustroistvo v Sibiri v Gody Stolypinskoi Agrarnoi Reformy, (Leningrad, 1962), p. 490; Aziatskaia Rossiia, Vol. I, (Petersburg, 1914), p. 318; Sbornik Statistiko-Ekonomicheskikh Svedenii po Sel'skomu Khoziaistvu Rossii i Inostrannikh Gosudarstv, Vol. IV, (Petersburg, 1910), p. 197 214; Vol. V, (Petersburg, 1911), p. 235, 253; V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria, (Novosibirsk, 1966), p. 356; L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p. 381-382; N.P. Oganovsky, Sel'skoe Khoziaistvo Rossii v XX Veke, (Moscow, 1923), p. 246-247, 262-263; I.N. Novikov, Razvitie Sel'skogo Khoziaistva Sibiri v 60-90kh Godakh XIX Veka, (Omsk, 1965), p. 127; P.I. Malakhinov, O Dvukh Tipakh Agrarnoi Evoliutsii v Rossii, (Ulan-Ude, 1962), p. 389.

Figure III.A.3: Cattle in Siberia and Its Districts
(Based on Appendix Table 28.)

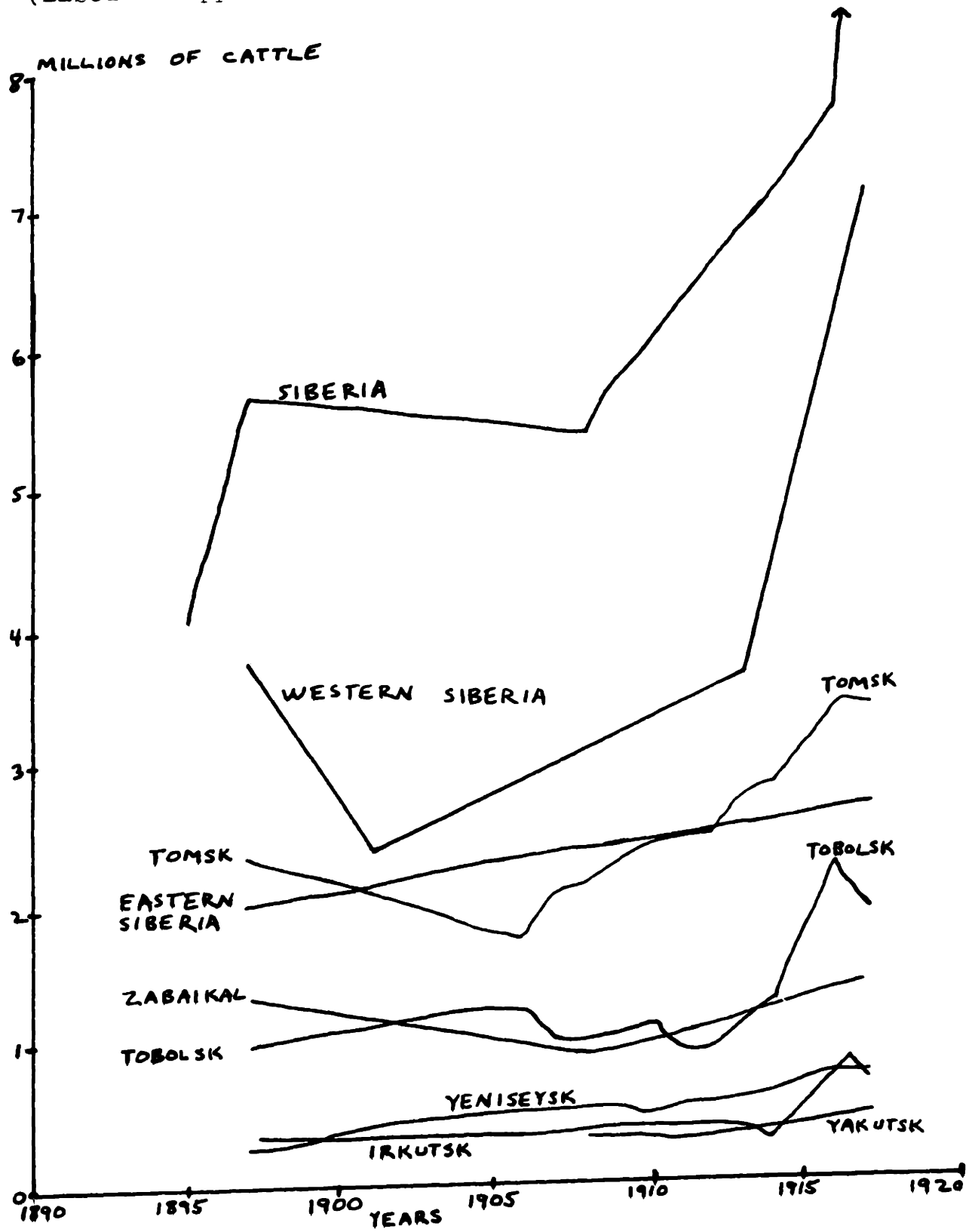

Table 29: Sheep in Russia, Siberia, and Its Districts

Year	Russia	RSFSR	European Russia	Siberia
1901			46,161,000	
1908	81,767,676		39,916,000	5,986,644
1909	81,315,397		39,931,000	6,063,690
1913			36,375,900	
1916		79,625,300	53,529,000	7,294,300
1917		75,380,600	50,441,500	7,090,500

Year	Western Siberia	Tobolsk	Tomsk	Yeniseysk
1901	2,911,300			
1908		838,090	2,891,607	730,818
1909		922,889	2,918,737	793,118
1911		627,466	2,426,842	728,779
1916		2,090,700	3,453,100	1,298,200
1917		1,780,800	3,674,900	1,246,300

Year	Irkutsk	Zabaikal	Yakutsk	Amur
1908	217,507	1,289,992	126	8,456
1909	224,724	1,189,934	145	9,973
1911	203,518	1,021,967	135	11,836
1916	452,000			
1917	988,200		300	

(Continued)

(Table 29 Continued)

Year	Primorskaia
1908	10,048
1909	4,170
1911	4,640

Sources: Aziatskaia Rossiia, Vol. I, (Petersburg, 1914), p. 318; Sbornik Statistiko-Ekonomicheskikh Svedenii po Selskomu Khoziaistvu Rossii i Inostrannikh Gosudarstv, Vol. IV, (Petersburg, 1910), p. 197, 214; Vol. V, (Petersburg, 1911), p. 235, 253; N.P. Oganovsky, Selskoe Khoziaistvo Rossii v XX Veke, (Moscow, 1923), p. 246-247, 262-263; P.I. Malakhinov, O Dvukh Tipakh Agrarnoi Evoliutsii v Rossii, (Ulan-Ude, 1962), p. 389.

Figure III.A.4: Sheep in Siberia and Its Districts
(Based on Appendix Table 29.)

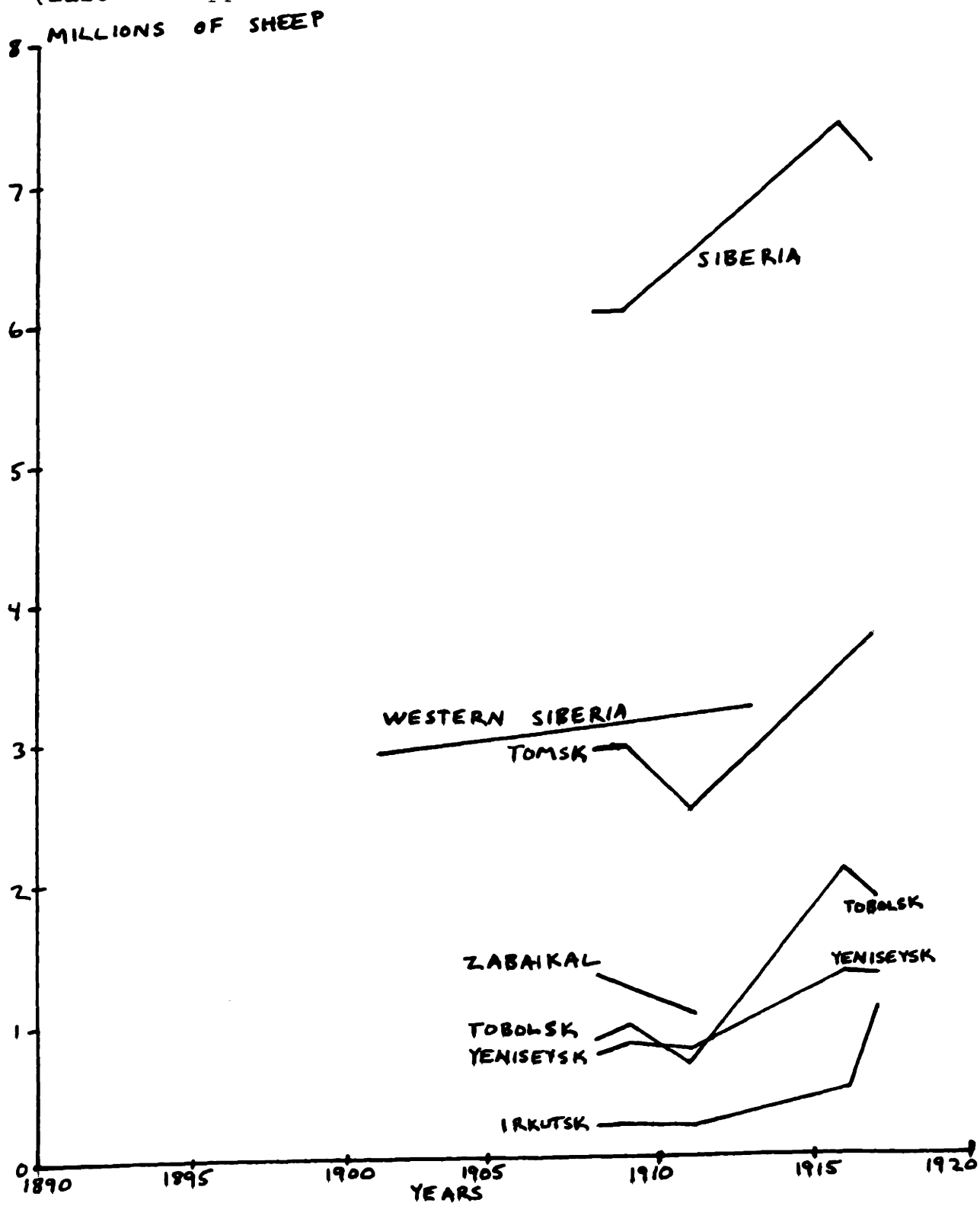

Table 30: Goats in Russia, Siberia, and Its Districts

Year	Russia	RSFSR	European Russia	Siberia
1908	4,607,375		749,000	404,000
1909	5,208,513		782,000	381,174
1916		3,190,200	1,348,800	167,500
1917		2,753,300	1,003,400	150,500

Year	Tobolsk	Tomsk	Yeniseysk	Irkutsk
1908	27,790	187,855	11,065	24,339
1909	22,551	207,032	12,033	19,245
1911	20,713	64,168	7,472	29,468
1916	25,700	48,000	18,500	75,300
1917	18,600	58,000	20,100	53,800

Year	Zabaikal	Amur	Primorskaia
1908	153,552	66	
1909	120,301	12	
1911	103,082	83	200

Sources: Aziatskaia Rossiia, Vol. I, (Petersburg, 1914), p. 318; Sbornik Statistiko-Ekonomicheskikh Svedenii po Sel'skomu Khoziaistvu Rossii i Inostrannikh Gosudarstv, Vol. IV, (Petersburg, 1910), p. 197, 214; Vol. V, (Petersburg, 1911), p. 235, 253; N.P. Oganovsky, Sel'skoe Khoziaistvo Rossii v XX Veke, (Moscow, 1923), p. 262-263.

Table 31: Pigs in Russia, Siberia, and Its Districts

Year	Russia	RSFSR	European Russia	Siberia
1860				564,000
1895				824,200
1901			11,680,900	
1908	14,441,479		11,389,000	1,123,317
1909	14,459,270		11,330,000	1,265,381
1910				1,368,700
1913			11,099,400	
1916		18,568,300	13,702,600	2,778,500
1917		20,679,000	16,153,100	2,573,900

Year	Western Siberia	Tobolsk	Tomsk	Yeniseysk
1901	430,200			
1905		236,888	266,877	116,177
1906		271,011	297,000	130,997
1907		200,588	379,741	130,291
1908		198,557	487,491	141,218
1909		242,993	552,171	139,250
1910		269,713	645,714	121,271
1911		154,786	508,253	123,307
1912		117,267	511,602	134,816
1913	686,400*	214,382	758,155*	134,371

*These figures are obviously contradictory; Tomsk gubernia is part of Western Siberia.

(Continued)

(Table 31 Continued)

Year	Western Siberia	Tobolsk	Tomsk	Yeniseysk
1914		262,548	876,548	140,669
1916		862,500	1,317,400	334,300
1917		638,700	1,300,100	377,100

Year	Irkutsk	Zabaikal	Yakutsk	Amur
1905	64,311			
1906	68,071			
1907	66,096			
1908	73,168	108,570	376	41,888
1909	66,653	115,784	708	47,512
1910	68,992			
1911	79,452	119,366	217	48,200
1912	79,444			
1913	76,908			
1914	83,154			
1916	263,200			
1917	256,900			

Year	Primorskaia
1908	72,046
1909	100,310
1911	91,187

(Continued)

Source: Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, (Leningrad, 1968-1969), p. 203; L.F. Skliarov, Pereselenie i Zemleustroistvo v Sibiri v Gody Stolypinskoi Agrarnoi Reformy, (Leningrad, 1962), p.490; Aziatskaia Rossiia, Vol. I, (Petersburg, 1914), p. 318; Sbornik Statistiko-Ekonomicheskikh Svedenii po Sel'skomu Khoziaistvu Rossii i Inostrannikh Gosudarstv, Vol. IV, (Petersburg, 1910), p. 197, 214; Vol. V, (Petersburg, 1911), p.235, 253; L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p. 381-382; N.P. Oganovsky, Sel'skoe Khoziaistvo Rossii v XX Veke, (Moscow, 1923), p. 262-263; P.I. Malakhinov, O Dvukh Tipakh Agrarnoi Evoliutsii v Rossii, (Ulan-Ude, 1962), p. 389; I.N. Novikov, Razvitie Sel'skogo Khoziaistva Sibiri v 60-90kh Godakh XIX Veka, (Omsk, 1965), p. 127.

Figure III.A.5: Pigs in Siberia and Its Districts
(Based on Appendix Table 31.)

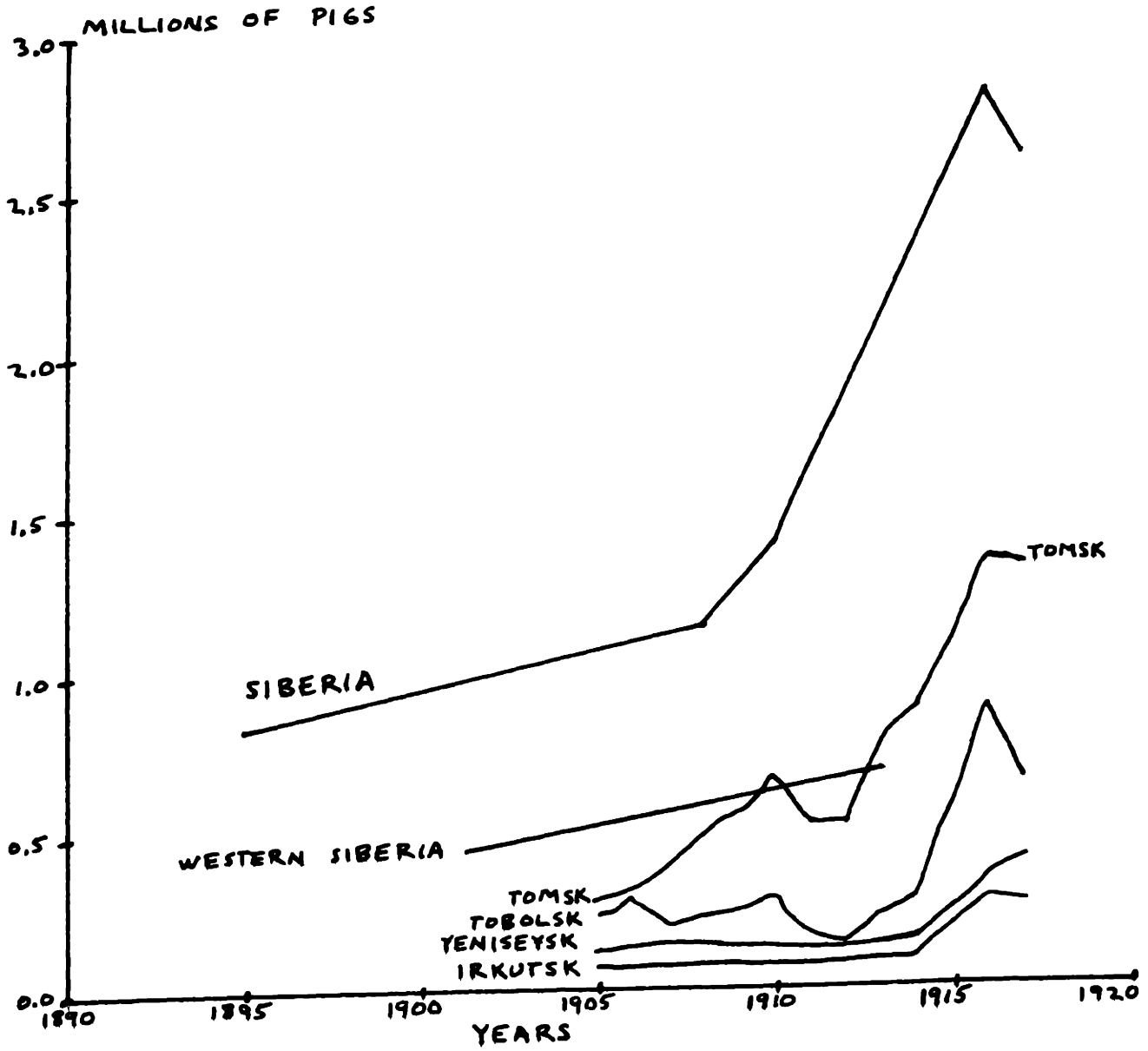

Table 32: Donkeys and Mules in Russia, European Russia, and Siberia

Year	Russia	European Russia	Siberia
1908	222,000	8,000	
1909	280,000	7,000	600

Sources: Sbornik Statistiko-Ekonomicheskikh Svedenii po Sel'skomu Khoziaistvu Rossii i Inostrannikh Gosudarstv, Vol. IV, (Petersburg, 1910), p. 214; Vol. V, (Petersburg, 1911), p. 253.

Table 33: Domesticated Reindeer in Russia, Siberia, and Its Districts

Year	Russia	European Russia	Siberia	Tobolsk
1906			564,860	95,360
1908	936,000	430,000	506,000	
1909	1,054,000	480,000	532,000*	
1910			1,100,000*	

*Note the difference between these two figures.

Year	Tomsk	Irkutsk	Zabaikal	Yakutsk
1906	2,000	2,400	2,000	287,000

Year	Primorskaia
1906	176,100

Sources: Aziatskaia Rossiia, Vol. I, (Petersburg, 1914), p. 327; Vol. II, p. 327; Sbornik Statistiko-Ekonomicheskikh Svedenii po Sel'skomu Khoziaistvu Rossii i Inostrannikh Gosudarstv, Vol. IV, (Petersburg, 1910), p. 214.

Table 34: Camels in Russia and Siberia

Year	Russia	European Russia	Siberia
1908	1,615,000	277,000	12,000
1909	1,726,000	260,000	12,000

Source: Sbornik Statistiko-Ekonomicheskikh Svedenii po Sel'skomu Khoziaistvu Rossii i Inostrannikh Gosudarstv, Vol. IV, (Petersburg, 1910), p. 214.

Table 35: Total Livestock Per 100 Inhabitants in European Russia and Siberia

Year	European Russia (38 gubernias)	Siberia	Four Siberian Gubernias
1864	44.6*		72.0*
1871	42.3*		
1904	34.0*		68.7*
1914	26.8*		65.6*
1917	140		316**

*These figures are for producing as opposed to working livestock.

**Alternative estimate: 284.

Sources: L.F. Skliarov, Pereselenie i Zemleustroistvo v Sibiri v Gody Stolypinskoi Agrarnoi Reformy, (Leningrad, 1962), p. 489; V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria, (Novosibirsk, 1966), p. 361.

Table 36: Horses Per 100 Inhabitants in the U.S.A., Russia, Siberia, and Its Districts

Year	U.S.A.	Russia	European Russia	Siberia
1908		20.8	17.6	54.9
1909		21.0	17.9	54.9
1910	25			
1913				53
1914			16.5	53.1

Year	Tobolsk	Tomsk	Yeniseysk	Irkutsk
1905	55.0	69.0	77.0	45.0
1906	55.0	68.0	74.0	45.0
1907	46.1	71.9	70.8	40.5
1908	43.6	60.9	69.3	36.5
1909	44.4	64.0	57.2	36.6
1910	47.1	68.7	48.8	36.3
1911	38.2	56.4	50.9	40.2
1912	35.9	61.6	53.6	34.9
1913	42.7	63.3	55.3	34.3
1914	42.9	67.9	54.6	30.4

Year	Zabaikal	Yakutsk	Amur	Primorskaia
1908	72.9	37.2	47.8	48.0
1909	71.1	34.9	44.7	39.4

Sources: L.F. Skliarov, Pereselenie i Zemleustoistvo v Sibiri v Gody Stolypinskoi Agrarnoi Reformy, (Leningrad, 1962), p.490; Sbornik Statistiko-Ekonomicheskikh Svedenii po Selskomu Khoziaistvu Rossii i Inostrannikh Gosudarstv, Vol.IV, (Petersburg, 1910), p. 197, 214; Vol. V, (Petersburg, 1911), p. 235, 253; V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria, (Novosibirsk, 1966), p. 358; L.M. Goriushkin, Sibirskoe Krestianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p. 156, 381-382; George Katkov, Erwin Oberlander, Nikolaus Poppe, and Georg Von Rauch, editors, Russia Enters the Twentieth Century, 1894-1917, (London, 1971), p. 146.

Figure III.A.6: Horses Per 100 Inhabitants
(Based on Appendix Table 36.)

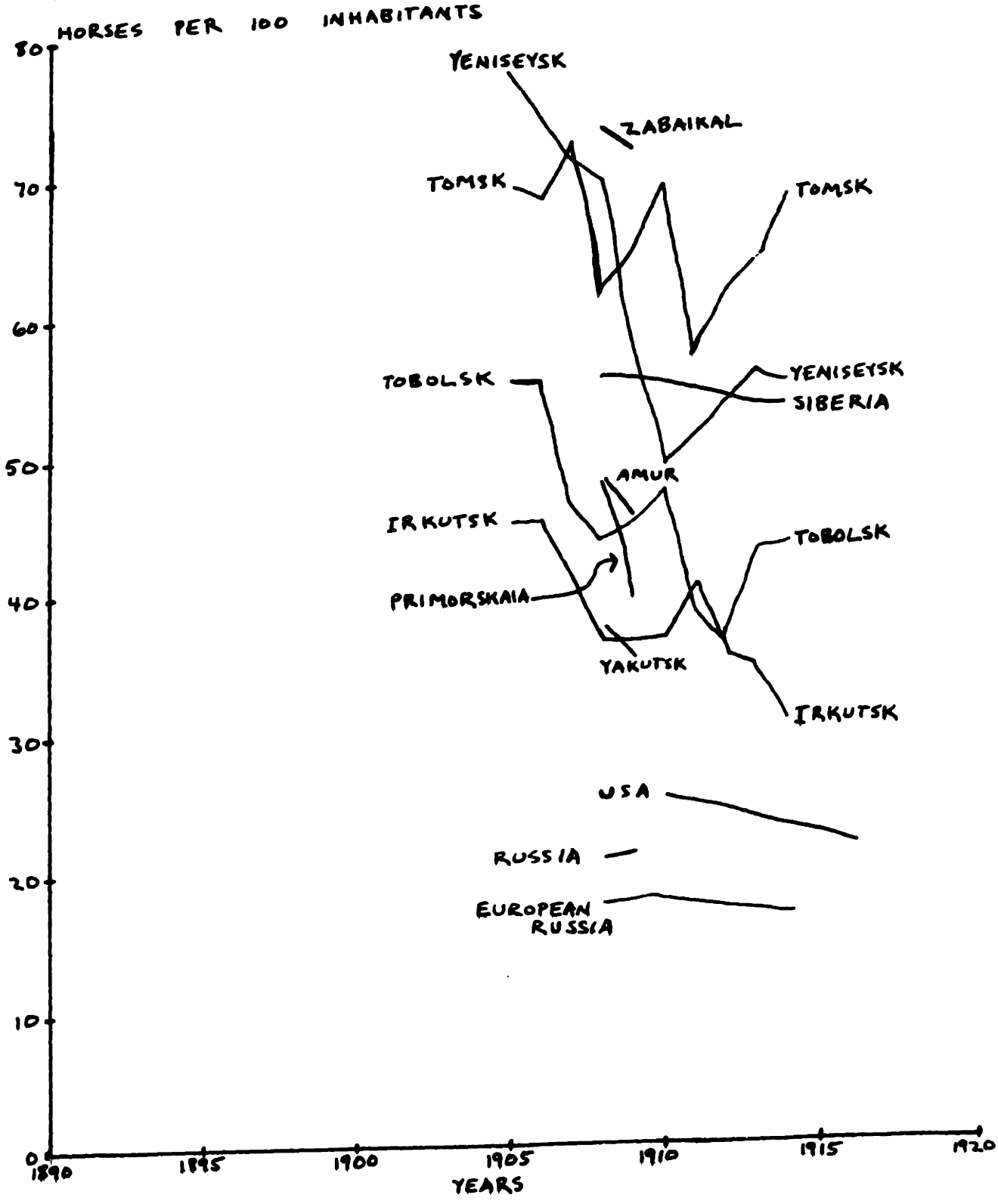

Table 37: Cattle Per 100 Inhabitants in the U.S.A., Russia, Siberia, and Its Districts

Year	U.S.A.	Russia	European Russia	Siberia
1908		31.2	25.5	68.2
1909		31.3	25.7	70.4
1910	82			
1913				63
1914			23.6	66.9
1916	62.2			
1917			17.5*	42*

*cows only.

Year	Tobolsk	Tomsk	Yeniseysk	Irkutsk
1905	81.0	82.0	86.0	68.0
1906	77.0	78.0	85.0	70.0
1907	59.1	82.9	70.1	58.0
1908	55.3	69.0	69.6	51.5
1909	57.9	72.7	61.1	54.6
1910	64.2	75.5	50.8	54.0
1911	45.9	64.0	51.5	49.6
1912	46.6	63.4	53.7	48.2
1913	56.2	70.8	57.3	47.4
1914	62.1	71.7	56.7	39.4

Year	Zabaikal	Yakutsk	Amur	Primorskaia
1908	110.1	103.7	33.8	49.1
1909	110.7	105.8	38.3	58.1

Sources: L.F. Skliarov, Pereselenie i Zemleustroistvo v Sibiri v Gody Stolypinskoi Agrarnoi Reformy, (Leningrad, 1962), p. 490; Sbornik Statistiko-Ekonomicheskikh Svedenii po Selskomu Khoziaistvu Rossii i Inostrannikh Gosudarstv, Vol.IV, (Petersburg, 1910), p. 197, 214; Vol. V, (Petersburg, 1911), p. 235, 253; V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria, (Novosibirsk, 1966), p. 358; L.M. Goriushkin, Sibirskoe Krestianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p. 156-157, 381-382; George Katkov, Erwin Oberlander, Nikolaus Poppe, Georg Von Rauch, editors, Russia Enters the Twentieth Century, 1894-1917 (London, 1971), p. 146.

Figure III.A.7: Cattle Per 100 Inhabitants
(Based on Appendix Table 37.)

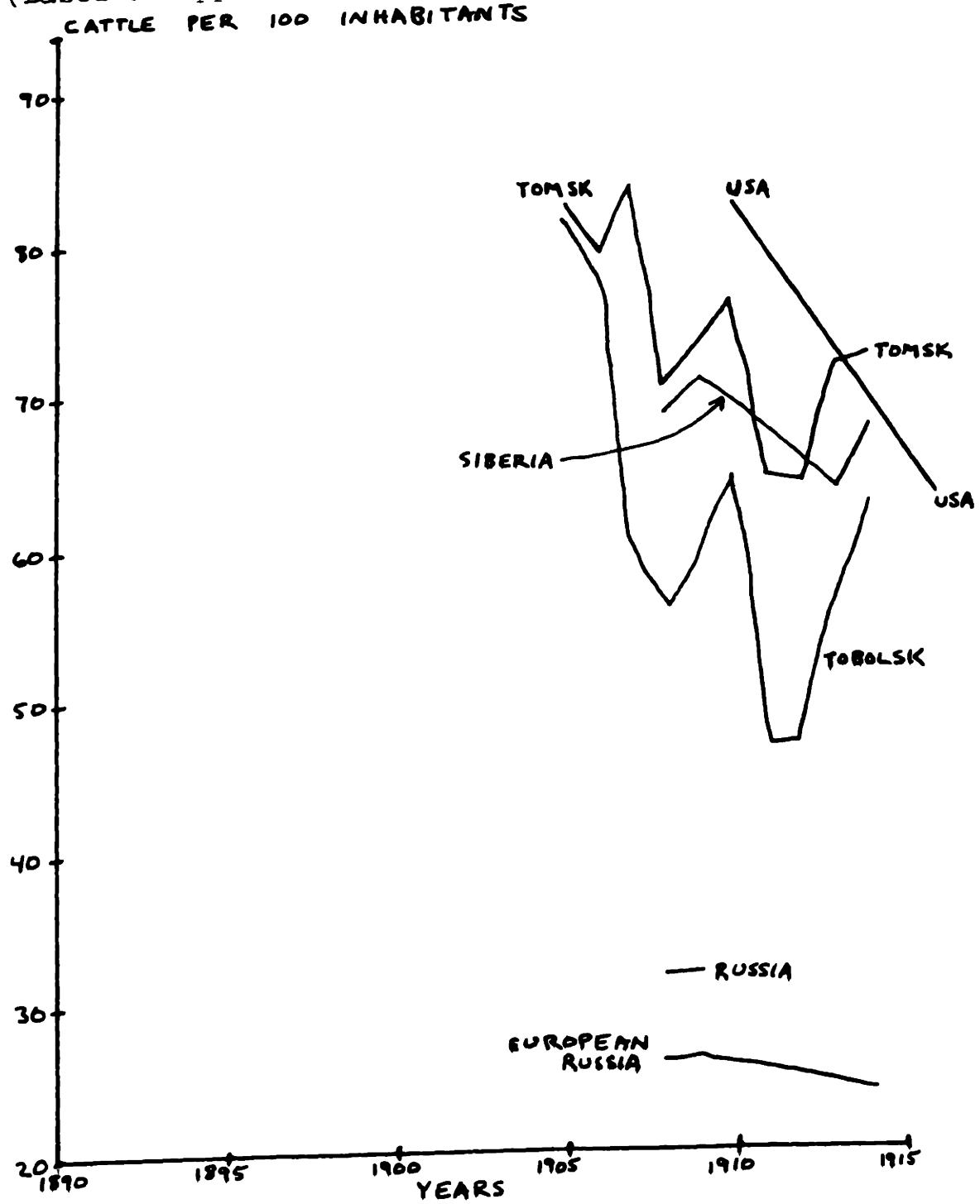

Figure III.A.8: Cattle Per 100 Inhabitants
(Based on Appendix Table 37.)

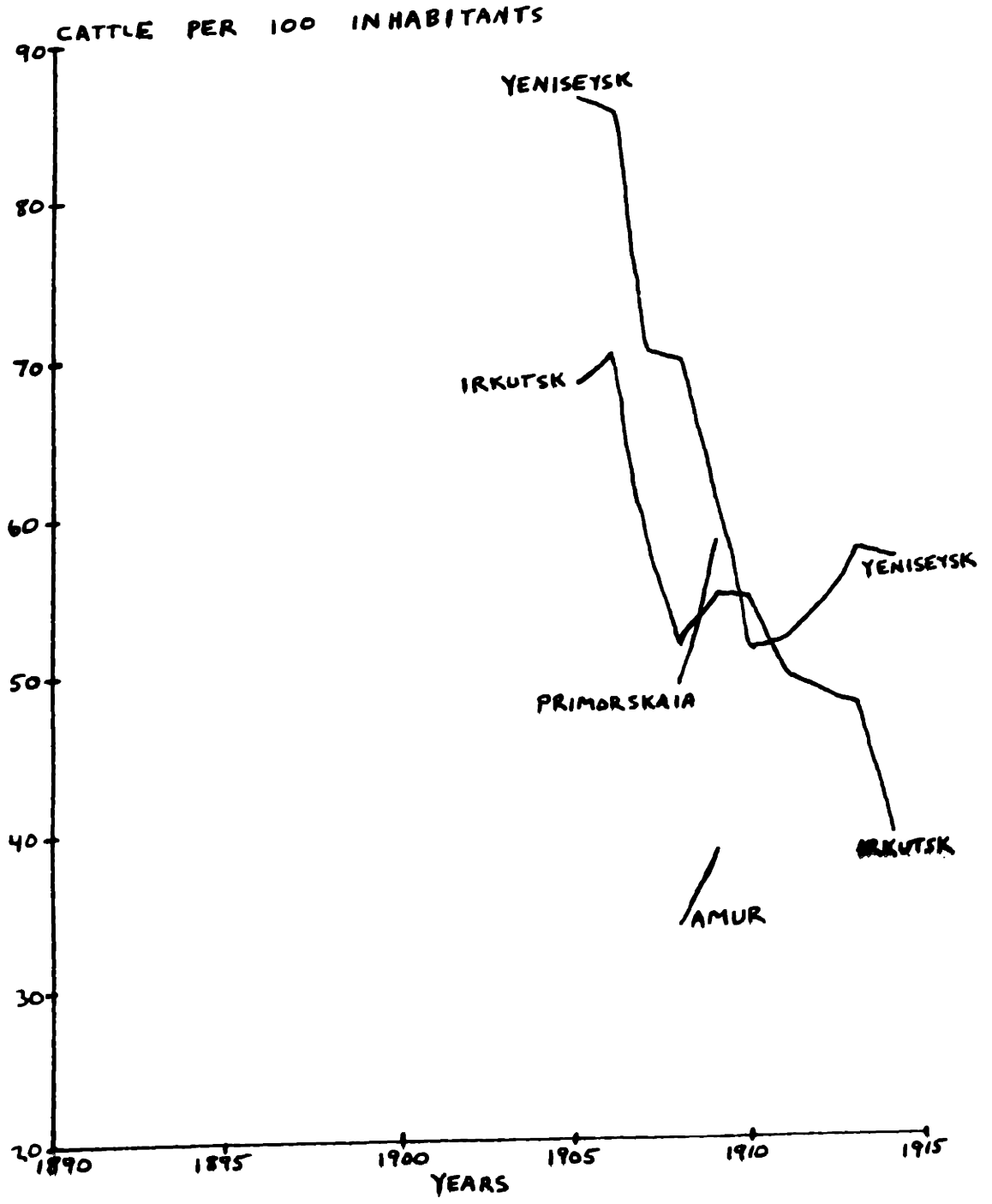

Table 38: Sheep Per 100 Inhabitants in U.S.A., Russia, Siberia, and Its Districts

Year	U.S.A.	Russia	European Russia (50 gubernias)	Siberia
1908		52.1	34.2	75.9
1909		50.6	33.6	74.2
1910	68			
1913				61
1914			30.2	60.3
1916	49.8			
1917			61*	84

*Refers to 38 gubernias.

Year	Tobolsk	Tomsk	Yeniseysk	Irkutsk
1908	47.3	92.7	103.6	33.1
1909	50.8	92.1	92.3	33.3
1914	47.3	73.8		

Year	Zabaikal	Yakutsk	Amur	Primorskaia
1908	159.9	0.0	4.3	3.7
1909	142.8	0.04	4.6	1.5

Sources: Sbornik Statistiko-Ekonomicheskikh Svedenii po Sel'skomu Khoziaistvu Rossii i Inostrannikh Gosudarstv, Vol. IV, (Petersburg, 1910), p. 197, 214; Vol. V, (Petersburg, 1911), p. 235, 253; V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria, (Novosibirsk, 1966), p. 358, 361; L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p. 156; George Katkov, Erwin Oberlander, Nikolaus Poppe, Georg Von Rauch, editors, Russia Enters the Twentieth Century, 1894-1917, (London, 1971), p. 146.

Figure III.A.9: Sheep Per 100 Inhabitants
(Based on Appendix Table 38.)

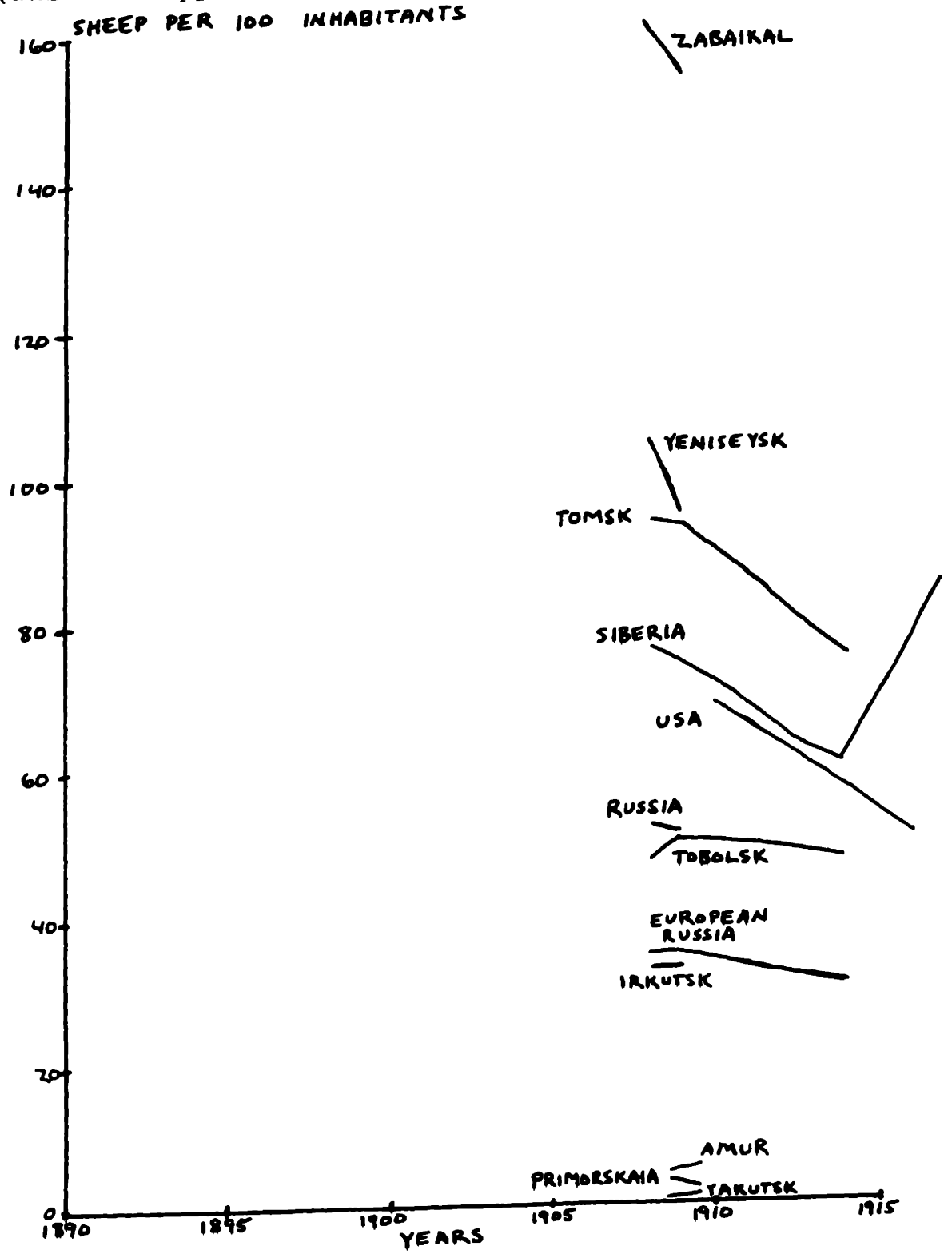

Table 39: Pigs Per 100 Inhabitants in U.S.A., Russia, Siberia, and Its Districts

Year	U.S.A.	Russia	European Russia (50 gubernias)	Siberia
1908		9.2	9.8	14.2
1909		9.0	9.5	15.5
1910	5.7			
1913				13
1914			10.1	17.0
1916	4.6			
1917			19*	35

*Refers to 38 gubernias.

Year	Tobolsk	Tomsk	Yeniseysk	Irkutsk
1905	15.0	12.0	20.0	13.0
1906	17.0	13.0	22.0	14.0
1907	11.9	14.9	18.8	11.5
1908	11.2	15.6	20.0	11.1
1909	13.4	17.4	16.2	9.9
1911	7.9	13.2	13.7	11.1
1912	5.9	13.0	14.9	10.6
1913	10.7	19.3	13.7	10.5
1914	12.8	21.9	14.2	11.1
Year	Zabaikal	Yakutsk	Amur	Primorskaia
1908	13.4	0.1	21.4	26.7
1909	13.9	0.2	21.8	35.7

Sources: L.F. Skliarov, Pereselenie I Zemleustroistvo v Sibiri v Gody Stolypinskoi Agrarnoi Reformy, (Leningrad, 1962), p. 490; Sbornik Statistiko-Ekonomicheskikh Svedenii po Sel'skomu Khoziaistvu Rossii i Inostrannikh Gosudarstv, Vol. IV, (Petersburg, 1910), p. 197, 214; Vol. V, (Petersburg, 1911), p. 253; V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria, (Novosibirsk, 1966), p. 358, 361; L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p. 156, 381-382; George Katkov, Erwin Oberlander, Nikolaus Poppe, Georg Von Rauch, editors, Russia Enters the Twentieth Century, 1894-1917, (London, 1971), p. 146.

Figure III.A.10: Pigs Per 100 Inhabitants
(Based on Appendix Table 39.)

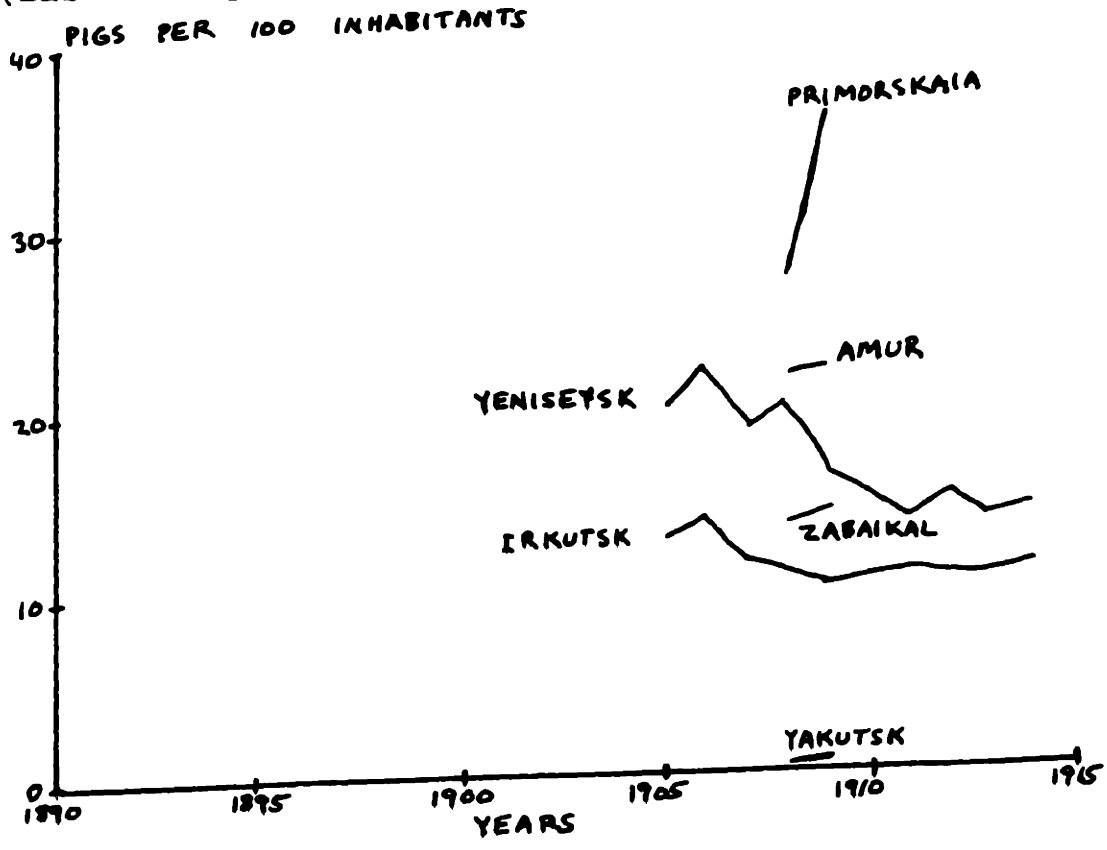

Figure III.A.11: Pigs Per 100 Inhabitants (continued)
(Based on Appendix Table 39.)

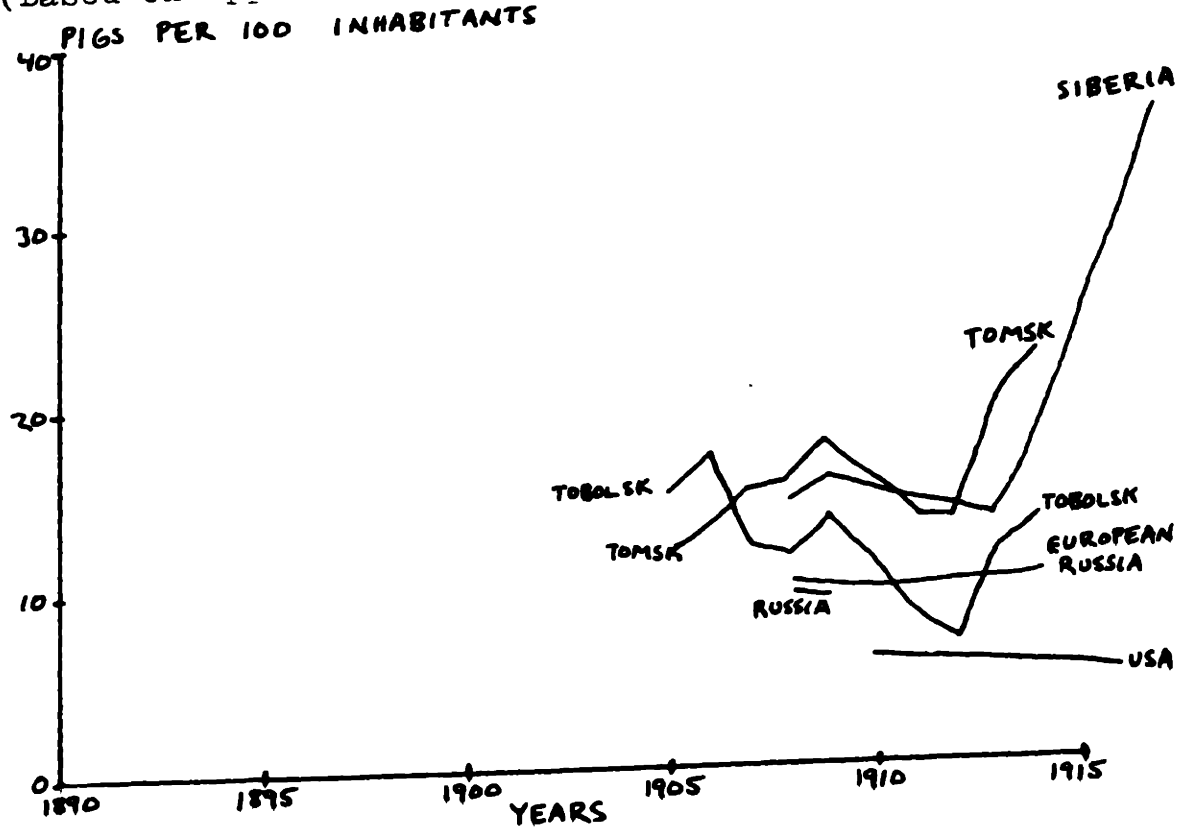

Table 40: Goats Per 100 Inhabitants in Russia, Siberia, and Its Districts

Year	Russia	European Russia	Siberia	Tobolsk
1908	2.9	0.6	5.1	1.6
1909	3.2	0.6	4.7	1.2

Year	Tomsk	Yeniseysk	Irkutsk	Zabaikal
1908	6.0	1.5	3.7	19.0
1909	6.5	1.4	2.9	14.4

Sources: Sbornik Statistiko-Ekonomicheskikh Svedenii po Sel'skomu Khoziaistvu Rossii i Inostrannikh Gosudarstv, Vol. IV, (Petersburg, 1910), p. 197, 214; Vol. V, (Petersburg, 1911), p. 235, 253.

Data Relating to Crop Yields

The measurement of yields per acre, seemingly a straightforward question, was answered in a number of ways by the statisticians of the Russian Imperial Government. Ideally, one would like accurate data on total area sown for each grain and total harvest for each grain, then average yield could be accurately computed with simple division. This was impossible, however, Sometimes, controlled random sampling was used and the average yield for an entire district projected from data pertaining to a few peasant households. At other times, the government agency making the estimate maintained its own fields in a district, worked them, and projected the yield to all the peasant households in the district. Another problem involves the question of what counted as yield. Should only clean grain count while chaff and straw (used as animal fodder) were disregarded? Should next year's seed be considered part of the yield? Should the quantity of seed used for a crop be subtracted to give a net yield? Should averages over time be taken to eliminate annual fluctuations? In order to dramatize the extreme differences which one can find in Russian statistics on crop yields, the following table is presented. The figures have not been converted to pounds per acre since only their relative values are of interest here.

Table 41: Harvests of Wheat and Oats in Uyezds of Siberia in 1907 in Poods of Cleaned Grain Minus Seed Retained for Next Crop Per Desiatina According to a) Data of Tax Collecting Agencies and b) Data Based on Volost Reports to the Central Statistical Agency

Uezd	a) Wheat	b) Wheat	c) Oats	d) Oats
Tobolsk Gubernia:				
Tobolsk	62	45	91	48
Tiumen	39	19	43	11
Kurgan	38	45	26	30
Ishim	57	29	53	10
Yalutorovsk	49	22	45	7
Turinsk	44	21	58	30
Tarsk	48	38	61	34
Tiukalinsk	39	18	34	6
Tomsk Gubernia:				
Tomsk	37-67	51	51-56	64
Barnaul	50	47	66	42
Biisk	66	53	79	88
Kuznets	86	52	89	42
Zmeinogorsk	56	47	55	42
Kainsk	73	51	93	69
Marinsk	65	59	73	76
Yeniseysk Gubernia:				
Krasnoyarsk	52	72	65	68
Kansk	57	52	85	52

(Continued)

(Table 41 Continued)

Uezd	a) Wheat	b) Wheat	c) Oats	d) Oats
Achinsk	69	54	87	63
Minusinsk	68	42	68	45
Yeniseysk	36	47	54	44
Irkutsk Gubernia:				
Irkutsk	38	46	48	51
Nizhniudinsk	44	41	44	48
Balagansk	42	35	45	34
Verkholensk	35	34	57	43
Average for All	53	43	62	44

Source: V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria, (Novosibirsk, 1966), p. 318.

Table 42: Yields of Chief Crops in Four Gubernias of Siberia in Pounds of Cleaned Harvest Per Acre on a) Peasant Land, b) Land Owned by Non-Peasant Individuals, c) Both Types Taken Together

Group	Years	Winter Rye	Spring Wheat	Oats
Tobolsk Gubernia:				
Peasant	1901-1905	-	629	629
Non-Peasant	1901-1905	-	789	723
Peasant	1906-1910	642	615	589
Non-Peasant	1906-1910	736	803	602
Both	1911-1915	656	669	789
Both	1916	562	656	736
Both	1917	896	977	1,030
Tomsk Gubernia:				
Peasant	1901-1905	-	549	642

(Table 42 Continued)

Group	Years	Winter Rye	Spring Wheat	Oats
Non-Peasant	1901-1905	-	522	575
Tomsk Gubernia:				
Peasant	1906-1910	669	763	816
Non-Peasant	1906-1910	696	789	830
Both	1911-1915	763	696	763
Both	1916	709	696	682
Both	1917	803	803	1,044
Yeniseysk Gubernia:				
Peasant	1901-1905	-	776	682
Non-Peasant	1901-1905	-	883	856
Peasant	1906-1910	642	696	763
Non-Peasant	1906-1910	776	990	803
Both	1911-1915	736	656	682
Both	1916	923	1,151	1,097
Both	1917	789	696	830
Irkutsk Gubernia:				
Peasant	1901-1905	-	428	549
Non-Peasant	1901-1905	-	508	589
Peasant	1906-1910	589	615	709
Non-Peasant	1906-1910	682	669	709
Both	1911-1915	709	642	736
Both	1916	-	-	-
Both	1917	642	549	656

Group	Years	Barley	Buckwheat	Millet
Tobolsk Gubernia:				
Peasant	1901-1905	656	308	468
Non-Peasant	1901-1905	749	375	482
Peasant	1906-1910	696	321	415
Non-Peasant	1906-1910	696	321	294
Both	1911-1915	696	308	-
Both	1916	629	-	-
Both	1917	1,004	455	803
Tomsk Gubernia:				
Peasant	1901-1905	776	455	468
Non-Peasant	1901-1905	642	495	642
Tomsk Gubernia:				
Peasant	1906-1910	789	468	602
Non-Peasant	1906-1910	870	749	830
Both	1911-1915	736	468	-
Both	1916	669	615	-
Both	1917	830	709	696
Yeniseysk Gubernia:				
Peasant	1901-1905	736	401	522
Non-Peasant	1901-1905	696	-	-
Peasant	1906-1910	682	375	562
Non-Peasant	1906-1910	696	-	-
Both	1911-1915	696	415	-
Both	1916	1,111	856	-
Both	1917	789	562	629

(Table 42 Continued)

Group	Years	Barley	Buckwheat	Millet
Irkutsk Gubernia:				
Peasant	1901-1905	642	268	308
Non-Peasant	1901-1905	455	-	-
Peasant	1906-1910	682	361	321
Non-Peasant	1906-1910	749	-	-
Both	1911-1915	763	388	-
Both	1916	-	-	-
Both	1917	656	401	535
Group	Years	Potatoes	Flax Seed	Hemp Seed
Tobolsk Gubernia:				
Peasant	1901-1905	5,018	-	-
Non-Peasant	1901-1905	4,937	-	-
Peasant	1906-1910	4,442	268	401
Non-Peasant	1906-1910	4,777	375	348
Both	1911-1915	-	321	401
Both	1916	-	361	375
Both	1917	7,239	321	468
Tomsk Gubernia:				
Peasant	1901-1905	4,870	-	-
Non-Peasant	1901-1905	4,308	-	-
Tomsk Gubernia:				
Peasant	1906-1910	5,579	401	482
Non-Peasant	1906-1910	4,188	535	508
Both	1911-1915	-	428	442

(Table 42 Continued)

Group	Years	Potatoes	Flax Seed	Hemp Seed
Both	1916	-	455	415
Both	1917	7,600	522	455
Yeniseysk Gubernia:				
Peasant	1901-1905	7,934	-	-
Non-Peasant	1901-1905	7,760	-	-
Peasant	1906-1910	5,218	361	495
Non-Peasant	1906-1910	5,914	-	629
Both	1911-1915	-	321	442
Both	1916	-	428	388
Both	1917	8,523	334	442
Irkutsk Gubernia:				
Peasant	1901-1905	5,686	-	-
Non-Peasant	1901-1905	7,560	-	-
Peasant	1906-1910	6,837	388	562
Non-Peasant	1906-1910	6,891	-	-
Both	1911-1915	-	321	535
Both	1916	-	-	-
Both	1917	8,938	348	281

Source: N.P. Oganovsky, Sel'skoe Khoziaistvo Rossii v XX Veke, (Moscow, 1923), p. 146-147.

Table 43: Yields in Pounds of Cleaned Harvest Per Acre Sown for Ten Major Agricultural Crops in the Four Siberian Gubernias, European Russia, and the Area Which Became the RSFSR After the Revolution (1923)

Crop	Years	Siberia	European Russia	RSFSR
Winter Rye	1901-1905	-	709	723
	1906-1910	642	629	629
	1911-1915	723	789	789
	1916	816	843	843
	1917	789	575	575
Winter Wheat	1901-1905	-	789	843
	1906-1910	-	736	763
	1911-1915	-	937	883
	1916	-	950	910
	1917	-	669	669
Spring Wheat	1901-1905	602	602	589
	1906-1910	669	589	562
	1911-1915	669	669	629
	1916	963	589	656
	1917	763	455	535
Oats	1901-1905	629	656	656
	1906-1910	749	682	669
	1911-1915	749	736	776
	1916	883	749	749
	1917	896	508	562
Barley	1901-1905	709	682	682
	1906-1910	709	682	682
	1911-1915	723	749	763
	1916	870	789	763
	1917	816	602	602

(Table 43 Continued)

Crop	Years	Siberia	European Russia	RSFSR
Buckwheat	1901-1905	361	375	388
	1906-1910	388	415	428
	1911-1915	401	495	522
	1916	562	669	669
	1917	535	575	575
Millet	1901-1905	442	562	589
	1906-1910	549	589	615
	1911-1915	-	696	682
	1916	-	682	642
	1917	669	589	562
Potatoes	1901-1905	5,874	5,339	5,232
	1906-1910	5,526	5,606	5,499
	1911-1915	-	6,623	6,636
	1916	-	6,222	6,222
	1917	8,082	4,629	5,633
Flax Seed	1901-1905	-	361	334
	1906-1910	361	375	348
	1911-1915	348	415	348
	1916	415	348	321
	1917	388	281	281
Hemp Seed	1901-1905	-	401	401
	1906-1910	482	428	482
	1911-1915	455	468	508
	1916	388	415	401
	1917	415	321	334

Source: N.P. Oganovsky, Sel'skoe Khoziaistvo Rossii v XX Veke, (Moscow, 1923), p. 157-158.

Table 44: Clean Harvest of Various Grains for Siberia, the U.S.A. and Germany Measured in Pounds Per Acre Sown

Crop	Years	Siberia	U.S.A.	Germany
Wheat*	1901-1905	602	830	1,686
	1906-1910	669	883	1,793
	1911-1915	669	926	1,947
Rye**	1901-1905	?	896	1,392
	1906-1910	642	910	1,512
	1911-1915	723	902	1,599
Oats	1901-1905	629	990	1,512
	1906-1910	749	990	1,753
	1911-1915	749	982	1,693
Barley	1901-1905	709	1,298	1,646
	1906-1910	709	1,231	1,753
	1911-1915	723	1,295	1,869
Buckwheat	1901-1905	361	789	?
	1906-1910	388	883	?
	1911-1915	401	963	?

*For Germany and U.S.A., spring and winter wheat; for Siberia spring wheat only.

**For Germany and U.S.A., spring and winter rye; for Siberia, winter rye only.

Source: L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p. 379.

Table 45: Clean Yield of Grain Products in Pounds Per Person in the Rural Population by Years for Each of the Four Siberian Gubernias and for the 72 Gubernias and Oblast's of European Russia

Region	1896	1897	1898	1899
Tobolsk	1,253	1,217	1,112	1,635
Tomsk	1,396	1,531	1,190	1,363
Yeniseysk	976	1,002	596	1,482
Irkutsk	941	822	522	1,196
European Russia	961	780	925	1,053
Region	1900	1901	1902	1903
Tobolsk	440	310	777	1,379
Tomsk	453	237	734	1,183
Yeniseysk	561	260	798	1,028
Irkutsk	519	586	409	648
European Russia	835	693	989	918
Region	1904	1905	1906	1907
Tobolsk	695	736	493	449
Tomsk	444	722	920	957
Yeniseysk	768	798	749	889
Irkutsk	774	608	680	661
European Russia	805	666	566	634

Source: Osobennosti Agrarnogo Stroia Rossii v Period Imperializma, (Moscow, 1962), p. 167-168.

This table is included only for the sake of completeness. The reader is warned against interpreting these figures as output-labor ratios. The figures refer to the entire rural population, not only to those engaged in agriculture. Nevertheless, a comparison of grain output per person between the Siberian gubernias and European Russia may be of some interest.

IV. The Factors Affecting the Agricultural Development of Siberia

The factors affecting the agricultural development of Siberia were numerous, complex, of varying degrees of importance, and often conflicting. In order to separate them for systematic study and analysis, they will be grouped under four headings: exogenous non-human factors, exogenous human factors, government policy and its effects, and market related human factors. Admittedly, these categories are not mutually exclusive and are somewhat arbitrary; nevertheless, they do allow a systematic approach to the study of these factors. They also allow for explicit recognition of important non-economic factors before the central question of this work -- the role of government versus that of private peasant enterprise -- is engaged.

Exogenous non-human factors include Siberia's climatic and soil conditions and the limitations which they imposed on agricultural expansion, the special burden imposed by the great distances both within Siberia and between Siberia and its markets in European Russia and beyond, the supply of arable land, and the peculiarities of Siberian livestock. These factors are not of direct interest here but serve to set the stage upon which the factors in the other categories played out their roles. None of these factors is time-specific, that is, there were no changes in these factors which caused the agricultural expansion of Siberia to occur

when it did.

The second category, that of exogenous human factors, is much more controversial. Under this category I have included the massive migration of European Russian peasants into Siberia, the characteristics of the Siberians and the migrants which distinguished them from European Russian peasants, the absence of a gentry class and a serf tradition in Siberia, the social and economic structures of Siberian peasant society, and other "human" factors such as technical progress, war, and revolutionary disruptions. The "timing" in the cccurence of all of these factors was important except for the absence of the gentry class and serf tradition and the social and economic structures of Siberian peasant society. These two factors were not "time-specific". This category is controversial because some of the factors under its heading have clearly economic aspects. There can be no doubt that the peasant migration into Siberia was to a significant degree motivated by peasant perception of economic opportunity and that government policy had a very real effect on it. Likewise, the social and economic structures of Siberian peasant society evolved largely to fulfill economic functions and to mediate between the government and the peasant. Nevertheless, these factors will be treated as exogenous for the following reasons. (1) The subject of this work is agricultural development, and migration, social

structure, and technical progress will be discussed only to the extent that they bear on this central concern; thus, factors such as migration, social structure, and technical progress are largely explanatory factors here, not phenomena to be explained. Readers interested in studying these subjects are referred to other works.[1] (2) Although these phenomena have definite economic aspects, it is not clear to what extent studying them would involve sociological, anthropological, or political analysis. For example, political and religious freedom were also motivations for migrating to Siberia, and peasant economic and social structures certainly had some basis in custom. The choice then is between labeling these factors exogenous and discussing their economic effects wherever relevant or considering them endogenous and leaving their non-economic aspects unanalyzed.[2] (3) Both the effects of these "human exogenous factors" on government policy and peasant initiative and effects of government policy and peasant initiative on these factors will be fully discussed under the last two headings (government policy and its effects and market-related factors).

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[1]See especially D.W. Treadgold, The Great Siberian Migration (Princeton, 1957).

[2]The third choice, including lengthy discussions of non-economic aspects of these phenomena would both alter the economic nature of this thesis and distract attention from the central concern -- agricultural development.

The third category covers the role of government actions and policies in Siberia's agricultural development. It includes government policy relating to Siberian development in general -- migration, the Trans-Siberian Railway, and the tax burden on the Siberian peasantry -- and government policy concerned with agricultural development in particular -- the system of land tenure and the Stolypin reforms, the opening up of the Siberian market for agricultural equipment, and the provision of technical and veterinary assistance. All these factors were important not only for their effects on the growth of Siberian agriculture but also in that their timing helped determine when that growth occurred. The general development of Siberia and its attendant problems will also become evident. The Tsarist government attempted to involve itself thoroughly in all aspects of Siberian agricultural development through either aid or regulation. Government regulation, however, was often ineffective -- especially when opposed to peasant interests. In such cases and whenever enforcement was difficult (government regulations concerning migration, for example), the peasants merely ignored the law and did whatever suited them. The only way for the government to prevent violation then was to legalize peasant practices. In such instances government policy followed peasant practice with a lag. Another problem was that government policy was often of a "schizophrenic" character

-- promoting agricultural development by one means while inhibiting it with another. Occasionally this was due merely to lack of coordination among different government departments. More often, however, it was brought on by a partial response to some pressure group which sought to retard Siberian development. Finally, there was often the common problem that even successful execution of government policy did not produce the desired effect.

The fourth and final category of factors affecting the agricultural development of Siberia covers market-related human factors. This category is largely concerned with the peasant response to economic opportunities and problems. These responses were important not only for their effects on the growth of Siberian agriculture but also in that their timing helped determine when that growth occurred. This category included the markets for Siberian agricultural products, cost advantages of Siberian producers, the land tenure system, the labor supply mechanism, the agricultural capital distribution system, techniques of crop rotation and fertilization, peasant agricultural information and experimentation, and the economic rewards for agricultural activity -- peasant income and wealth.

The following chapters will discuss the factors determining the agricultural development of Siberia organized into the four categories outlined above: non-human exogenous,

human exogenous, government, and market-related. Under each of these categories those factors affecting agricultural development in general (the railroad and migration, for example) will be discussed first, followed by discussion of more specialized or product-specific factors (such as the mechanical separator used for butter-making). A final chapter will then compare the contributions of government and peasant enterprise to the agricultural development of Siberia in an effort to determine whether Siberian development was typically Russian, a product of government development efforts, or more similar to American frontier development, the product of private enterprise and peasant or independent farmer initiative.

V. Non-Human Exogenous Factors

The non-human exogenous factors which affected the agricultural development of Siberia were climate, soil, extremes of distance, the supply of arable land, and peculiarities of Siberian livestock.[1] Of these factors, climate and distance were no doubt the most serious constraints on Siberian agricultural development with soil characteristics and the supply of arable land much less crucial. The peculiarities of Siberian livestock were even less important.

A. Climate

Siberian climate is typically continental and is marked by extreme differences between winter and summer temperatures and little precipitation. It is generally similar to the climate in European Russia at similar latitudes but is subject to longer and colder winters. Vegetation usually appears in May and disappears in October. Over this period the mean temperature is about 56 degrees in Western Siberia and is between 53 and 60 degrees in Eastern Siberia. In September temperatures fall rapidly. Both spring and fall are extremely short seasons.[2]

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[1] Brief comments on topography, climate, and distance have already been presented in Chapter II, Section A.

[2] A Handbook of Siberia and Arctic Russia, Vol. I, General, (London, n.d.), p. 28.

Precipitation over the year is quite low. In the far north, it is only about eight inches per year. As one moves south, however, it gradually increases to eighteen inches or more in the southern parts of Western Siberia. The Pacific coast does not follow this pattern: the Amur region in the south usually gets twenty inches or more per year, while the Kamchatka Peninsula receives forty inches or more from the monsoons. On the average 50% to 55% of annual precipitation throughout Siberia falls between June and August. Winters are customarily dry. Drought is not uncommon throughout Siberia, yet much of Siberia, especially the northern half of Western Siberia, is bog throughout the summer. This paradox is explained by a number of factors: (1) Siberia is well-laced with rivers which have sources in the mountains along the southern frontier; (2) these rivers are frozen for over six months out of the year which slows drainage; (3) the gentle gradient of the Western Siberian lowland plain also slows drainage; (4) Siberia's generally frozen subsoil can absorb little water, so it will collect in pools and ponds to be dissipated only by evaporation.[3]

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[3] A Handbook of Siberia and Arctic Russia, Vol. I General, p. 32-33.

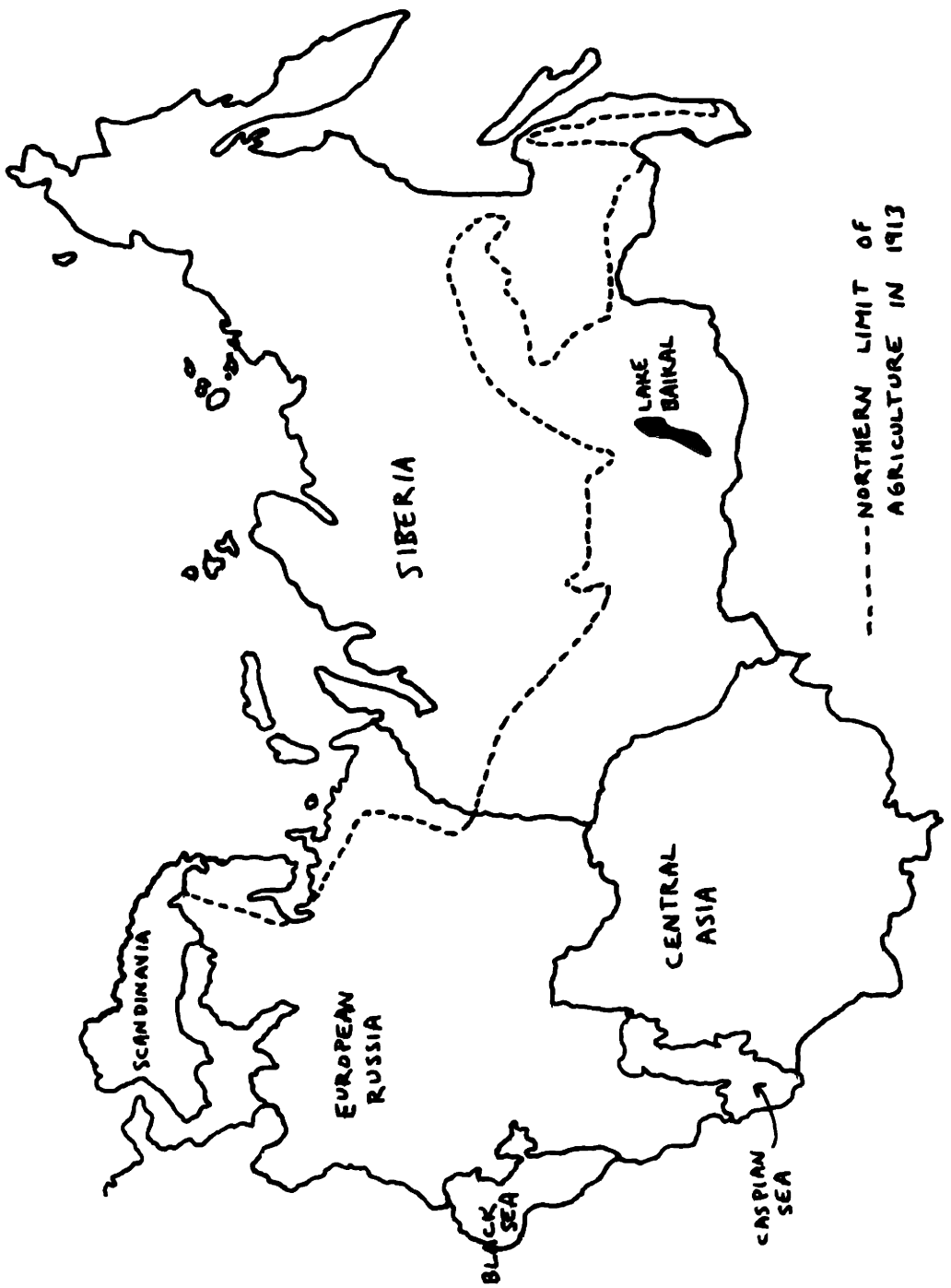

FIGURE V.1: NORTHERN LIMIT OF AGRICULTURE IN SIBERIA IN 1913

The effect of climate on Siberian agriculture is first and foremost to limit it to the southern part of the region. Figure V.1 on the following page gives an outline map of Russia as it was in 1913. The dotted line reflects the northernmost limits of agricultural activity in that year.[4] While climate denied a sufficient growing season to a relatively small proportion of the total area of European Russia, its effect on Siberia was much more severe, closing more than two thirds of the region to agriculture. It should also be noted that the areas immediately south of the dotted line were areas in which agriculture, though possible, was both difficult and risky.

Figure V.2 is provided as a further illustration of the role of climate in Siberian agriculture.[5] It matches weather stations in Siberia with their thermally analogous regions on the North American continent for the May through September spring crop growing season. It should be noted that these matchings are approximate and do not indicate similarities in other climatic conditions such as pressure, wind, or precipitation. Nevertheless, Figure V.2 serves to impress upon the reader more familiar with North American conditions

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[4]Figure V.1 is derived from Harold Fullard, ed., Soviet Union in Maps: Its Origin and Development, (London,,1965), p. 17.

[5]Figure V.2 is derived from Michael Y. Nuttonson, Agricultural Climatology of Siberia, Natural Belts, and Agro-Climatic Analogues in North America, (Washington, D.C., 1950).

FIGURE V.2: THERMALLY ANALOGOUS AREAS IN SIBERIA AND NORTH AMERICA DURING THE SPRING CROP GROWING SEASON

the limitations which temperature alone places on Siberian agriculture. Along the southern portion of the map, the most numerous names are Alberta, Saskatchewan, and Manitoba. As one moves north and east, however, the names of Alaska and Northwest Territory become predominant. The climatic constraint on Siberian agricultural development should be apparent from Figures V.1 and V.2.

There are also, however, certain aspects of Siberia's climate which are favorable to agriculture. Although the growing season may be limited, conditions during that season are close to ideal. Summer temperatures from June through August are quite warm, but clouds and rainfall protect the crops from what would otherwise be disastrous heat. Rainfall is usually very evenly distributed, so crops receive the maximum benefit from it. Yet under these conditions, less than normal cloud cover and rainfall may be severely damaging.

The sparse winter snowfall in Eastern Siberia is not sufficient to insulate the land against the severe cold; thus, the ground freezes to great depths even in the south. Over the summer months, the surface may thaw only up to a few feet down. This forces Eastern Siberian trees to spread their root systems out laterally rather than penetrate further down. The frozen subsoil actually has some advantage in the cultivation of crops. Where summers are sufficiently long,

the short roots of crops do not reach the frozen subsoil, but this frozen subsoil inhibits drainage and helps to provide water for the crops in case of drought. The other side of the coin is, of course, that poor drainage may lead to swampy soil and also prevent run-off of fertilizer. This makes it quite easy to "burn out" a crop by over-manuring. In the southern reaches of Western Siberia, greater winter precipitation and warmer temperatures prevent this permanent freezing of the subsoil which is common in the north and east.

Frosts are also an ever-present danger to crops since they may occur in early summer or even late August and September. In some areas along the northern limit of agriculture in Figure V.1, July is the only frost-free month.[6] In conclusion then, climate limits Siberian agriculture chiefly through cold by imposing a short growing season and threatening frosts. Also of importance, however, are drought due to low precipitation or bog due to poor drainage caused by both topography and climate.

B. Distance

There can be little doubt that after climate distance was the most important natural factor affecting Siberian development. A glance at any map of Russia reveals both the immense size of Siberia and its isolation from the rest

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[6] A Handbook of Siberia and Arctic Russia, Vol.1, p. 33-34.

of the world. In the west Siberia is separated from European Russia by the Ural Mountains. These low mountains, however, are not a barrier to passage. The barrier is the bog and swamp which predominates in the northern two thirds of Western Siberia east of the Urals. This region is not only impassable in the summer but also uninhabitable. Footing is treacherous in the swamp and the urman--swamp covered by dense thickets--prevents passage. Water is often saline or brackish. Mosquitoes and other blood-sucking pests are so thick that even wild reindeer and caribou are driven north to the tundra. The dimensions of this swampy area are quite impressive: almost a thousand miles from the Urals to the Yenisey River at its widest and approximately 700 miles from north to south.[7] To the north, Siberia is bordered by the Arctic Ocean which is ice-locked for six months of the year. To the east lies the Pacific Ocean. Unfortunately however, even this outlet is not as promising as it might seem at first. All of the Pacific coastline is ice-locked at least part of the year, and Vladivostok is the only port of significance. The hinterland of the Pacific coast produced little of value before World War I, and the mountain range along the coast made transport to the sea extremely difficult. To the south, Siberia is bordered by Mongolia and Russian Central Asia. Trade with these regions was

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[7]See Fullard, p. 15.

usually conducted by means of caravans, but such transport was quite expensive and limited. These natural barriers cutting Siberia off from its neighbors served to magnify the effects of the great distances both within Siberia and between Siberia and the rest of the world.

The effect of the immense distances within Siberia (over 4,000 miles from the Urals to the Pacific) were also magnified by two internal factors. First, Siberia's great rivers almost all flow north into the Arctic Ocean and are ice-locked six months of the year; thus, they are of little use in connecting Siberia with the rest of the world. Second, climate confined most agricultural activity and therefore most productive activity in Siberia to the southern edge of the region. As agriculture expanded, it could only expand eastward increasing the distance to markets in European Russia. Only the introduction of the railroad was finally able to partially overcome this burden of increasing distance which accompanied expansion. In fact, commercial agricultural production in Siberia was huddled in a narrow band extending on the average from 100 to 150 versts (66.29 to 99.44 miles) on either side of the Trans-Siberian Railway, which hugged the southern border of Siberia. This doesn't sound like much but that narrow band was so long that its total area exceeded the areas of Germany, Austria-Hungary, Holland, Belgium, and Denmark put together. Yet this was

less than 20% of the total area of Siberia.[8]

Thus, climate, distance, and natural barriers all combined to isolate Siberia from the rest of the world and made trade even with European Russia costly and difficult. Natural barriers left the southern route by rail through European Russia as Siberia's only viable link with the rest of the world. As we shall see later, this allowed the Tsarist government to turn Siberian trade on and off like a faucet. Transport costs were also increased by immense distances, the effect of which was magnified by having all significant economic activity strung out in a narrow band stretching 4,000 miles from the Urals to the Pacific. Even trading patterns within Siberia were splintered by distances: Tomsk in Western Siberia was closer by rail to Moscow than it was to the only Siberian port of Vladivostok; in fact, the Baltic ports of Riga and Petersburg were not much farther from Tomsk than Vladivostok. The important role of transport costs will be discussed later.

C. Soil Characteristics[9]

Surprisingly enough, soil characteristics were of relatively minor importance in limiting the agricultural

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[8] L.M. Goriushkin, Sotsialno-Ekonomicheskie Predposylki Sotsialisticheskoi Revoliutsii v Sibirskoi Derevnie (The Socio-Economic Preconditions of the Socialist Revolution in the Siberian Village), (Novosibirsk, 1962), p. 81.

[9] Derived from A Handbook of Siberia and Arctic Russia, Vol. I, p. 232-247.

development of Siberia before the Revolution. The rigors of the climate generally left any constraint which might be imposed on agriculture by soil conditions ineffective. There can be little doubt that the peasant took soil conditions into account when he decided what crop to sow, but even in this decision he was more likely to be worried about beating the frost or bearing the cost of transporting his harvest to market than about impoverishing the soil. Land was so abundant that long periods of fallow were common in most districts right up to the War. Nevertheless, a brief description of Siberian soil is in order here.

The most desirable soil in Siberia was naturally black soil rich in humus. Siberia, however, had two kinds of black soil. The more fertile, on high ground, was marked by a significant clay content. The less fertile black soil, on lower ground, was poor and barren with a high peat content. It was suitable only for growing oats. The black soil on high ground was reasonably well-drained, while the black soil on low ground was improperly drained, suffered from a build-up of nutrients, and would "burn out" all but a few crops. Climate played a role here since it affected the depth at which the subsoil was permanently frozen and, thus, partially determined the quality of drainage.

Also common in Siberia were <u>bieliks</u>. These were areas in which as little as two or three inches of black soil held

in place by grass or plant roots covered a stratum of unproductive light gray soil heavy with clay. This light gray soil usually extended downwards another nine or ten inches until it hit a red-yellow clay. Bieliks can be sown with cereal crops only with heavy use of manure and fallow periods as long as twenty-five years after only three or four crops. Using them as pasturage generally made better sense.

In the south of Siberia (especially Western Siberia) the predominant soil is dark brown, crumbly, heavy with clay, and mixed with white sand. The subsoil is red clay. Black soil is also common in the wooded steppe of Western Siberia. The best soil in Western Siberia, however, is to be found along the route of the Trans-Siberian Railway. It has a surface layer of black earth fourteen to twenty-four inches deep which is almost stoneless; below that is a substratum rich with loam.

Crops naturally vary somewhat according to soil conditions. Wheat predominated in southwest Tobolsk gubernia, the Kainsk and Mariinsk uezds of Tomsk gubernia, the Altai, and some parts of Akmolinsk oblast' which have a sandy black soil. Barley and spring rye were especially suitable to the brown soils of central Tomsk gubernia where the ground is less fertile. Winter rye was particularly common in the extreme southern portions of Yeniseysk and Irkutsk gubernias. Winter corn was predominant in the more

northern districts of Siberia, while spring corn was more important than the winter variety in the rest of Siberia. In Eastern Siberia generally, livestock-raising based on good grasslands predominated over the sowing of cereal crops.

D. The Supply of Arable Land

Statistics concerning the supply of useful land in Siberia have already been presented in Chapter III, Section B.[10] Nevertheless, some further comment on the effectiveness of this factor as a constraint on Siberian agricultural development is in order. Land shortage is a common constraint on agricultural expansion and the "land hunger" was a popular topic in European Russia before the Revolution. The supply of usable land in Siberia is of note, however, only because it was not an important constraint on agricultural development. Even after the turn of the century, places could be found in which at least certain types of land were virtually a free good; parcels belonged to whoever worked them until they were abandoned. True enough, some land prices in Western Siberia approached European Russian levels just before the War, but this was because the land was especially fertile and well located. Even in Western Siberia, large numbers of unoccupied parcels of agricultural land could be found as late as 1916. The Tsarist government's attempts

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[10] See especially Table III.5. Data on area sown to specific crops are in the Appendix to Chapter III.

to install peasants on the plentiful and productive land in the Russian Far East failed. Good land east of Lake Baikal was too far from European Russian markets to attract many peasant immigrants. Once again, the constraints of climate and distance were the really effective ones.

In specific districts in which the supply of arable land seriously constrained peasant agriculture, the problem was usually grounded in the extreme nature of local topography and vegetation. Mountainous districts naturally could not support agriculture, nor could the often swampy lowlands. Agriculture was also difficult in areas with extremes in natural vegetation. The true steppe in the extreme south of Western Siberia and the north of Central Asia was virtually treeless. Shortages of timber and firewood presented definite problems to peasants settling on this steppe. The opposite problem was faced by peasants settling in the taiga--the forest zones of Siberia. There arable land was extremely valuable since every acre had to be laboriously cleared of trees and stumps. Around 1900, the cost of clearing a single acre of pine forest in Eastern Siberia was 26.75 rubles.[11] By comparison, the average price for Siberian agricultural land involved in officially sanctioned land sales between 1908 and 1910 varied from 9.63 to 17.77

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[11]Goriushkin, p. 13.

rubles per acre.[12]

To repeat, although natural conditions often increased the costs of using some lands or even closed them to use, the supply of arable land was not a serious constraint on Siberian agricultural development.

E. Siberian Livestock

Few characteristics of Siberian livestock were of much significance in their effects on Siberian agricultural development, the high butterfat content of Siberian milk being the most outstanding exception. Nevertheless, some discussion of livestock characteristics is in order both for completeness and to remove any misconceptions the reader may have. The most important domestic animals to be found in Siberia were horses, milk cows, beef cattle, sheep, goats, and pigs. There were also significant numbers of less conventional stock--camels, yaks, reindeer, and other types of deer. Each will be discussed briefly below.

Most of the horses found in Siberia between 1890 and 1917 were native breeds. There were five major breeds of horses native to Siberia. The most important breed was the Kuznets or Tomsk horse. It was quite versatile and could be ridden, used to pull a load, and was also adopted by the Siberian military. The Tomsk horse had an excellent reputation and was even exported to European Russia. It

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[12]See Table III.8 in Chapter III.

was also used in the Russo-Japanese War. The average price for a three-year-old ranged between 100 and 200 rubles; a pedigree brought 300 to 400 rubles and the value of a prize-winner could reach 1,000 rubles. A good rider could make 70 to 100 versts (46.4 to 66.3 miles) in a day on one of these horses. Herds of horses spent the summer on pastureland: they spent the winter huddled together for warmth in pens, while exceptionally valuable animals were kept in heated sheds. The usual winter food was dry hay; oats or barley were added on days when the animals were worked. In the summer months in taiga (forest) districts, horses were kept in the village during the day and let out to forage in the cool of night in an effort to protect them from voracious Siberian mosquitoes.[13]

The other major types of horses found in Siberia were the Kirghiz, Buryat, Amur, and Abakan or Minusinsk breeds. The Kirghiz horse was mainly a saddle horse and was found chiefly in steppe regions. The Buryat horse, usually found in Irkutsk gubernia and Zabaikal oblast' was also chiefly a riding horse. The Amur horse, raised along the Amur River, was a husky breed suitable for heavy work. The Abakan or Minusinsk breed was raised in Yeniseysk gubernia, where horse-breeding had become quite developed. This horse was

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[13] Aziatskaia Rossiia, Vol. I, Liudi i Poriadki za Uralom (Asiatic Russia, Vol. I, Peoples and Customs Beyond the Urals), (Petersburg, 1914), p. 301-303.

suitable for riding yet was powerful enough to pull heavy loads.[14] The first stud stables were opened in Tomsk gubernia in 1897. Their purpose was to cross-breed Siberian stock with imported horses. One of the most popular imported studs was the English saddle horse which brought 400 to 450 rubles in Siberia. By 1914, stud farms were dotted across Siberia and the new cross-breeds were beginning to appear.[15]

Siberian cattle were largely of native breeds, but some imported stock could be found. The number of native breeds was large with almost one breed for every important tribe. Siberian cattle were generally smaller than their European Russian counterparts. This was probably due more to harsh conditions and poor care than to heredity. The average weight for a live cow was 16 to 18 poods (577.8 to 650.0 pounds); the slaughtered weight of 7 to 8 poods (252.8 to 288.9 pounds) included 4.5 poods (162.5 pounds) of meat.[16] The weight of a bull averaged between 22 and 26 poods (794.5 to 938.9 pounds) live and 10 to 14 poods (361.1 to 505.6 pounds) slaughtered.[17] Altai stock is generally larger with live cows

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[14]Aziatskaia Rossiia, Vol. I, p. 304-306.

[15]Aziatskaia Rossiia, Vol. I, p. 306-308.

[16]Aziatskaia Rossiia, Vol. I, p. 308; Goruishkin,p.65.

[17]Aziatskaia Rossiia, Vol. I, p. 308.

weighing in at 19 to 20 poods (686.1 to 722.3 pounds).[18]

Cattle were not as well cared for as were horses. Even in the Siberian winter they were usually kept in outdoor pens with only their long fur as protection from the cold. The natives usually expended the least effort in providing for their herds with the Buryats probably taking worse care of their cattle than other native tribes. The Buryat breed, found in Irkutsk gubernia and Zabaikal oblast', was usually in extremely poor condition. Its saving grace was that the Buryats could make a weak vodka-like drink from the milk called "tarasoon." Buryat stock kept by the Cossacks of Zabaikal oblast' reflected their better care in their larger size and better health. The best cared-for cattle were to be found in the possession of Russian immigrant peasants. The immigrants often kept (at least) milk cows in heated sheds in the winter and stored up more winter feed per animal. Successful Russian peasants often became full-time cattle raisers and maintained herds of 50 to 300 head. The chief enemies of the cattle in Siberia were Siberian ulcer--a sore which could be checked only be destroying contaminated animals--and cattle plague for which a vaccine had been developed.[19]

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[18] Aziatskaia Rossiia, Vol. I, p. 309.

[19] Aziatskaia Rossiia, Vol. I, p. 309-312.

Meat cattle predominated in steppe regions especially in Western Siberia, which was closer to the urban markets of European Russia. The average annual slaughter of meat cattle was 10% of the total stock.[20] The raising of milk cows, on the other hand, was concentrated in wooded-steppe and mountain-taiga districts.[21] Milk yields varied greatly depending on breed and condition of the stock. The milk yield of the Siberian cow, however, was quite low in general. The average annual yield of the Siberian cow was between 900 and 1,000 kilograms.[22]

The mixed breeds (Koryak or Manchurain with Zabaikal, other Siberian, or a European Russian breed) of the Priamur region yielded an average of only 459 kilograms per year.[23] By comparison, Danish cows gave 2,600 kilograms of milk per year per head. The fact that the low yields of Siberian cows was due mostly to neglect was established in the Kainsk uezd (of Tomsk gubernia) school of animal husbandry in 1913. Cows chosen at random from local stock were given good care and proper diet. Their average annual yield reached 2,240

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[20]Goriushkin, p. 65.

[21]Goriushkin, p. 62.

[22]V.G. Tiukavkin, Sibirskoe Derevnia Nakanune Oktiabria (The Siberian Village on the Eve of October), (Novosibirsk, 1966), p. 355.

[23]Aziatskaia Rossiia, Vol. I, p. 312.

kilograms (86% of the Danish average) with a maximum yield of 3,600 kilograms in one year.[24] Siberian milk cows made up for their low yields by producing milk with higher butterfat and sugar content. A study of milk of local cows in Tomsk gubernia, Nizhniudinsk uezd of Irkutsk gubernia, and European Russia in 1913 revealed the following percentages.

Table V.I: Butterfat and Solid Content of Milk Tested in 1913 Survey[25]

	Tomsk	Nizhniudinsk	European Russia
Butterfat Content	4.56%	6.26%	4.2%
Solid Content	14.25%	16.2%	13.05%

From these figures it is clear that the milk of Siberian cows, especially those which grazed on the lush pastures of Eastern Siberia, was of a higher quality than that of other Russian cows. Nor was the livestock of Nizhiudinsk uezd highly exceptional since the butterfat content of milk from Siberian cows normally ranged between 4% and 7%.[26] This high butterfat content meant that less milk was needed to produce a given amount of butter, and, as has been noted in Chapter III, butter was one of Siberia's most important exports. The

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[24] Tiuakvkin, p. 355.

[25] Tiukavkin, p. 353.

[26] Aziatskaia Rossiia, Vol. I, p. 309.

Siberian Union of Butter Artels estimated that approximately 21 pounds of Siberian milk was required to make one pound of butter. In comparison, one pound of butter required 27 pounds of milk from Danish cows of Jutland stock; Denmark was Siberia's greatest competitor in the world butter market. The difference in quality of milk was probably due to the fact that Siberian cows were fed mostly green fodder while Danish stock subsisted to a large extent on oilcakes imported from Russia.[27] If we accept the figures of average milk yield per cow given above, then the Siberian cow could yield in one year sufficient milk to produce between 42.8 and 47.6 kilograms of butter. The Danish cow could yield in one year sufficient milk to produce 96.3 kilograms of butter--twice the butter productivity of the Siberian cow despite the higher butterfat content of Siberian milk.

In summary then, the average product of the Siberian dairy cow was between 900 and 1,000 kilograms of milk or between 42.8 and 47.6 kilograms of butter per year. The average product of a beef cow (at 10% average slaughter per year) was between 25.28 and 28.89 pounds of usable material per year including 16.25 pounds of meat.

Sheep were also an important type of livestock kept in Siberia. The predominant breed of sheep in all of Asiatic Russia including Siberia was the Kirghiz sheep. (The native

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[27]Tiukavkin, p. 353.

people known as Kazakhs today were called Kirghiz at the turn of the century in an effort to avoid confusing them with the Cossacks.) The sheep produced wool, milk, meat, and fat. A live Kirghiz sheep weighed between 108.4 and 162.5 pounds when fully grown with males being somewhat heavier. The live sheep were sheared twice a year, each time yielding 3.6 to 5.4 pounds of coarse uncleaned wool per head. Part of this wool was used by the shepherds and the rest was sent to factories to be used in making valenki--warm felt boots. Sheep's milk was consumed whole and was also used to make cheese. Each slaughtered sheep yielded 36.1 to 108.4 pounds of usable material including 36.1 pounds of meat.[28] One curious fact about this sheep was that a considerable portion of its useful slaughtered weight was in its tail. The Kirghiz sheep stored fat in their tails much like a camel stores fat in its hump. Thus, the fatty tail of a Kirghiz sheep might weigh anywhere from 4.5 to 36.1 pounds. The shepherds made use of some of the fat while the remainder was sent to Russian candle factories. Native shepherds were usually nomadic and drove their flocks from pasture to pasture. The sheep ate whatever they could find and, if they couldn't find anything, they didn't eat. Russians usually took much better care of their flocks. They often maintained them in some type of

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[28]Usable material always included the meat. It might or might not include fat, hide, bone, entrails, and so forth depending on the condition of the animal and the local uses for these other parts.

protective enclosure during the winter and other times of bad weather and stored up straw to be used as winter food.[29]

There were other types of sheep of less importance in Siberia. The Mongolian breed was found in the Siberian Far East. It was similar to the Kirghiz breed but gave only 1.8 to 2.7 pounds of wool at a shearing.[30] The valuable Astrakhan sheep from which Persian lamb (fur) is obtained was not to be found in Siberia. However, some fine-fleeced sheep were raised in the more hospitable districts of Siberia and northern Central Asia--on the Cossack lands of Akmolinsk and Semipalatinsk oblast's, on Kabinet (Crown) lands in Zmeinogorsk uezd of Tomsk gubernia, and in southern Yeniseysk gubernia. These sheep yielded an average of 11.7 pounds of wool per head at each shearing.[31]

In summary then, the Siberian sheep over the period of our concern yielded between 7.2 and 10.8 pounds of coarse uncleaned wool per head per year.[32] Since the average annual slaughter covered approximately 25% of the stock each year,[33] the yield of usable material after slaughter

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[29] Aziatskaia Rossiia, Vol. I, p. 312-313.

[30] Aziatskaia Rossiia, Vol. I, p. 313.

[31] Aziatskaia Rossiia, Vol. I, p. 314-315.

[32] They were clipped twice a year and yielded 3.6 to 5.4 pounds at each clipping.

[33] Goriushkin, p. 65.

was 9.0 to 27.1 pounds per head per year including approximately 9 pounds of meat.

Goats and pigs were also important elements in the agricultural economy of Siberia. Goats were raised for meat, milk, and wool; pigs were meat producers only. Both of these animals were imported from European Russia and were raised by Russian peasants. Some settled natives also kept goats and pigs. Moslem natives, of course, would not raise pigs. Almost all goat products were retained for local use and were not marketed extensively.[34] The raising of pigs, on the other hand, developed rapidly along commercial lines. It followed in the wake of butter-making plant construction throughout Siberia. This was because the pigs could be fed the whey and other byproducts of butter production. Extensive commercial pig-raising first appeared in Kurgan uezd of Tobolsk gubernia and spread eastward across Siberia. The industry boomed in Kurgan uezd where almost 25,000 hogs were kept to satisfy local demands for pork as early as 1900. By 1908, refrigeration and sausage plants had been built by a Danish firm. In 1909, 26,000 hogs were slaughtered and processed in Kurgan uezd alone; the figure for 1910 was 34,000.

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[34] Aziatskaia Rossiia, Vol. I, p. 315.

Bacon, sausage, and canned meat were exported both to other parts of Siberia and over the Urals to European Russia. In 1910, Kurgan uezd derived an income of 1,729,000 rubles from its large butter industry. The pork industry there, which had originally developed as a satellite of the butter industry, brought an income in that same year of 1,478,000 rubles or 85% of the income from butter-making.[35] English hogs were imported in the decade before the War to improve the Siberian breeds and pig-raising showed promise of further expansion throughout Siberia.[36] The average meat yield from a Siberian pig was 144.5 pounds and the annual rate of slaughter of the stock was approximately 50%.[37] Thus, for each pig maintained in Siberia for a given year, approximately 72.25 pounds of meat was produced in that year. This compares quite favorably with the figures of annual meat output per animal for other livestock in Siberia: 16.25 pounds per head for cattle and 9 pounds per head for sheep.

Siberia also had substantial numbers of less conventional livestock. They were mostly ignored in livestock statistics because they were raised almost entirely by

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[35]Tiukavkin, p. 377-378.

[36]Aziatskaia Rossiia, Vol. I, p. 315.

[37]Goriushkin, p. 65.

native nomads who were hard to find or raised by settled natives who lived in northern Siberia--they could be found only with considerable inconvenience and hardship. Chief among these often forgotten types of livestock were camels, yaks, reindeer, and other types of deer.

Camels were raised extensively by the Buryats and Kazakhs; they raised both the single and double-humped varieties. The single-humped camels are bigger and stronger. Both varieties were given much the same treatment as horses and cattle. They were raised for milk, wool, and to provide transportation services. They were vital both to military expeditions and to railroad construction since they were the chief means of transporting supplies. Camels shed their heavy coats of hair immediately after winter; hence, about 10.8 pounds of hair could be pulled in tufts from each camel in the spring.[38]

Yaks were raised extensively by the natives of Turkestan but could also be found in southern Siberia--notably in the southern uezds of Irkutsk gubernia. They were raised for meat and milk and were exceptionally easy to care for. They are obedient and gentle animals and their shaggy fur makes them invulnerable to the dreaded Siberian mosquito. Their meat sold for only slightly less than good beef.[39]

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[38] Aziatskaia Rossiia, Vol. I, p. 315-317.

[39] Aziatskaia Rossiia, Vol. I, p. 317-318.

The reindeer was the base on which virtually every northern Siberian tribe depended for its livelihood. It served the same purposes as did the horse, the cow, and the sheep in more temperate climates. The reindeer was to the northern Siberian native what the buffalo was to the plains Indian of North America. The reindeer provided milk with a high butterfat content which was used to make cheese. Its meat, internal organs, fat, brains, and blood were used as food; even the antlers were used to prepare a meat-jelly. Hides were used both for clothing and for construction of dwellings. Antlers and bones provided the raw materials for tools. Reindeer wool was used to make thread; intestines were used to make sausages; candles were made from reindeer lard. Reindeer products were also sold commercially. The hides were used to make gloves, wallets, and purses. Hides of baby reindeer, covered with a soft down-like fur, were especially valued for hats, warm gloves, and stoles. Smoked reindeer meat was also sold commercially. The reindeer also served as an important means of transportation. In marshy tundra areas, it even replaced the horse. The reindeer can travel for ten to twelve hours at a stretch without stopping to rest or eat; in this way it can cover 100 <u>versts</u> (66.29 miles) per day without a rest. But if the reindeer is rested for a few minutes every 10 <u>versts</u> (6.629 miles), it can easily cover 200 <u>versts</u> (132.58 miles) in a

single day. They can maintain this pace for up to five days on practically no food at all. The reindeer can also be hitched to a sleigh--usually two or more, one in front of the other. Castrated males were usually used as draft animals. They cross streams easily since they are good swimmers even when pulling a heavy load; the flat-bottomed sleds they pull usually float.

Reindeer are migratory animals and natives who herd them follow the same migratory patterns as do the wild animals. They winter in the southern parts of the tundra which are still far north of the populated agricultural zones of Siberia. In the summer they move north even as far as the Arctic Ocean. This is necessary because in the summer the southern tundras turn marshy and are covered with clouds of blood-sucking pests. The chief food of the reindeer is Cladonia rangiferina or "reindeer moss." Siberian reindeer herders used dogs extensively both to herd the reindeer and to protect the animals from wolves. Reindeer herders in European Russia and Siberia were unique in that they kept their animals in pens at night. Reindeer are not nearly as tame as more conventional domestic animals; thus, the pens were necessary for milking--the animal must still be tethered inside the pen. The average herder ran from 15 to 20 head of reindeer, but wealthy natives were known to maintain herds of up to 2,000. Herds were built

up both through natural reproduction and by capturing wild reindeer.

The greatest enemy of the reindeer-herding peoples were the diseases and pests which attack their animals. Epidemics often wiped out herds and a formerly rich family found itself destitute. At the turn of the century, this problem was further complicated by the fact that Siberian reindeer herders did not trust the government veterinarians who wanted to innoculate their animals. Their next most dangerous enemies were the Siberian wolves which travelled in huge packs and killed in the early 1900's an average of 10,000 domesticated reindeer per year in Siberia.[40]

Some suggestion of the importance of reindeer-herding in Siberia is given in the following table.

Table V.2: Total Numbers of Domesticated Reindeer in Districts of Siberia in 1906[41]

District	Reindeer	District	Reindeer
Tobolsk	95,360	Irkutsk	2,400
Yakutsk	287,000	Zabaikal	2,000
Primorsky	176,100	Total	564,860
Tomsk	2,000		

Other types of wild animals were also bred in Siberia, some for very odd purposes as the following example indicates. The "maral" was a small species of reindeer bred by Russians

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[40] Aziatskaia Rossiia, Vol. I, p. 319-327.

[41] Aziatskaia Rossiia, Vol. I, p. 327.

in the Altai and parts of Semipalatinsk and Zabaikal oblast's and Irkutsk and Yeniseysk gubernias. They were kept in pens and fed straw in winter while the males were fed wheat in the spring to promote antler growth. The "maral" has neither commercial nor domestic value except for its antlers which were highly prized by the Chinese for making various medicines and aphrodisiacs. Depending on the state of the market and their quality, "maral" antlers sold for 7.8 to 11.1 rubles per pound; the average weight of an antler is 4.5 to 5.4 pounds. In 1913, there were counted 10,000 head of "maral" in Siberia.[42]

F. Final Remarks

Conspicuous by its absence is any mention of special characteristics of Siberian crops or seed types. Siberian peasants generally planted the same crops as their European Russian counterparts albeit in different proportions.[43] Nor have I found a single reference to any seed types peculiar to Siberia throughout this period. This is not terribly surprising for the following reasons. (1) Advanced commercial agriculture in Siberia was quite young, having received its first real impetus with the coming of the railroad. There had been little time to develop new seed

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[42] Aziatskaia Rossiia, Vol. I, p. 329.

[43] See Chapter III, Section A and accompanying Appendix.

types. (2) There were few attempts to develop new strains since other projects were considered more important and government agronomic aid was pitifully inadequate anyway. (3) The growing conditions in the agricultural areas of Siberia were not terribly different from those in agricultural areas in European Russia at similar latitudes, so seed types used in European Russia usually adapted to Siberian conditions reasonably well.

This concludes our review of the non-human exogenous factors which affected the agricultural development of Siberia. As noted at the beginning of this chapter, climate and sheer distance were the most important natural factors limiting Siberia's agricultural expansion before the REvolution. All other factors were of relatively minor importance but have been discussed here both for the sake of completeness and to dispell any misconceptions the reader may have had concerning them.

VI. Exogenous Human Factors

There were four largely exogenous human factors which were of major importance in their effects on the agricultural development of Siberia: migration into Siberia, the Siberian social structure, technical progress, and the economic disruptions of World War I. The first two of these factors, migration and social structure, will be discussed in further detail in the later chapters concerned with government policy and peasant response to economic opportunity; nevertheless, the basic facts and exogenous aspects of these two factors may appropriately be covered here.

A. The Great Siberian Migration[1]

The great Siberian migration was a mass movement of Russians eastward across the Urals from European Russia. In many ways it was quite similar to the westward expansion in the United States, which took place in the nineteenth century. Both movements involved expansion into frontier areas. Both were initially motivated largely by the economic gains to be had first from fur-trapping and trading and later from mining, especially of gold and silver. In both cases the farmer followed after the

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[1]Much more thorough coverage of this topic can be found in D.W. Treadgold, The Great Siberian Migration, (Princeton, 1957).

trapper, trader, and prospector with agriculture undergoing its most impressive expansion after the completion of a transcontinental railway. (In the Siberian case the continent crossed was Asia.)

There were two major groups involved in the nineteenth century migration into Siberia: exiles and prisoners who were sent to Siberia in punishment and peasants who migrated there on their own volition. The relative importance of these two groups in reflected in the table given below.

Table VI.1: Russian Migrants Reported as Settling in Asiatic[2] Russia Between 1801 and 1914

Years	Peasants, Exiles, and Prisoners	Annual Average	Exiles and Prisoners	Per Cent Exiles and Prisoners
1801-1850	375,000	8,000	251,000	67
1851-1860	191,000	19,000	99,000	52
1861-1870	254,000	25,000	140,000	55
1871-1880	248,000	25,000	179,000	72
1881-1890	419,000	42,000	138,000	33

(Continued)

[2] V.V. Obolensky (Osinsky), Mezhdunarodnye i Mezhdukontinental'nye Migratsii v Dovoennoi Rossii i SSSR (International and Intercontinental Migrations in Pre-War Russia and USSR), (Moscow, 1928), p. 84; percentages calculated by me. Obolensky-Osinsky also states that unreported migrants did not exceed 700,000 over the entire period 1801-1914; this implies an absolute maximum of migration of 6,400,000. Asiatic Russia includes Central Asia and the Russian Far East as well as Siberia, but Siberia received the overwhelming majority of migrants to Asiatic Russia. See the appendix to this chapter for further discussion of these figures.

(Table VI.1 Continued)

Years	Peasants, Exiles, and Prisoners	Annual Average	Exiles and Prisoners	Per Cent Exiles and Prisoners
1891-1900	1,208,000	121,000	133,000	11
1901-1910	2,282,000	229,000	23,000	1
1911-1914	723,000	180,000	29,000	4
Total	5,700,000	50,000	992,000	17

The importance of Siberia's well-known prisoners and exiles as a factor in migration dropped dramatically beginning in the 1890's; thus, the Siberian migration after 1890 is established as largely a voluntary movement of peasants from European Russia to Siberia. The reasons for peasant migration were naturally many and varied, but two were most important: Siberia's great expanses of unoccupied land in European Russia and the great personal freedom to be found in the far reaches of Siberia.[3] Contrary to the popular picture of Siberia as a vast and forbidding penal colony, the scholar G.T. Robinson went so far as to say that "among the peasants west of the Urals, Siberia was regarded as a kind of Utopia."[4] Yet almost a fifth of the people who went there did so only under duress as prisoners or exiles. Siberia's vast expanse had been open to colonization

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[3]The extent of unoccupied land in Siberia has already been discussed in Chapter III, Section B. More will be said on personal freedom in Siberia in Chapter VM, Section B below.

[4]G.T. Robinson, Rural Russia Under the Old Regime, (New York, 1949 reprint), p. 251.

for a long time and talk of land shortage had been prevalent in European Russia even immediately after the emancipation of the serfs in 1861. Then why did the great expansion of peasant migration come only in the 1890's? The chief reason for this sudden interest in Siberia was the construction of the Trans-Siberian Railway. The land had always been there, but a peasant could eat only so much of its fruits. He had to have a market in which he could sell his excess products in exchange for the manufactured goods he wanted. The railroad provided the Siberian peasant with access not only to European Russia but to world agricultural markets.

Data on Siberia's population has already been presented.[5] In order to give some idea of the importance of migration for total Siberian population growth, the following table is presented. It should be noted that this table is based on official statistics and is of questionable accuracy; therefore, only the most general conclusions may safely be drawn from it.[6]

Table VI.2: Migrants as Percentage of Total Population Growth in the Four Siberian Gubernias[7]

Gubernia	1897-1905	1906-1914	1897-1914
Tobolsk	43.4%	35.0%	37.9%
Tomsk	69.1%	59.7%	61.8%

(Continued)

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[5]See Tables III.10 to III.12 in Chapter III.

[6]See text at the beginning of the Appendix to this Chapter.

[7]See Table 1 in the Appendix to this Chapter.

(Table VI.2 Continued)

Gubernia	1897-1905	1906-1914	1897-1914
Yeniseysk	135.5%*	45.9%	59.6%
Irkutsk	32.8%	29.8%	30.2%
Total	67.6%	50.7%	54.6%

*Official statistics imply that immigration exceeded total population growth in Yeniseysk gubernia in 1897-1905. This is theoretically possible but highly unlikely, since it would require a forbiddingly high death rate.

The contribution of migration to total population growth according to these statistics did not drop below 25% for any of the four Siberian gubernias and remained above 50% for the group as a whole. Two more statistics may be of help in establishing the relative magnitude of Siberian population growth and migration. Between 1897 and 1923, the total population growth of the area which became the USSR was 34.7%; that for Siberia and the Russian Far East was 74%. Evan in 1926, the census of Siberia revealed that 23% of the population had not been born in Siberia. This 23% does not include most of the children and grandchildren of those who had migrated in the peak years of 1907-1909 or before.[8]

The influx of migrants did nothing to even out Siberia's concentration of population in Western Siberia. This region, with only two fifths of Siberian territory, received four fifths of the immigrants; Eastern Siberia, with three fifths

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[8]Treadgold, p. 35.

of Siberian territory, received the remaining one fifth.[9]

Figures reflecting the contribution of migration to Siberian population growth, however, do not indicate the full importance of migration for Siberian agricultural expansion. Migration involved not merely population growth but also expansion into previously unsettled frontier areas. A rough indicator of the magnitude of this expansion is the increase in the number of villages and volost's (the smallest administrative units) in Siberia and its surrounding regions. This is only a rough indicator since villages and volost's could differ greatly both in population and land area encompassed. The following table gives the percentage increase in their numbers between the years 1898 and 1912 for all the gubernias and oblast's of Asiatic Russia subject to colonization except Turkestan.

Table VI.3: Percentage Increase in Numbers of Villages and Volost's in Asiatic Russia Between 1898 and 1912[10]

Gubernia or Oblast'	Percentage Increase from 1898 to 1912	
	Villages	Volost's
West of Siberia		
Uralsk	47	45
Turgai	80	150

(Continued)

[9] V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria (The Siberian Village on the Eve of October), (Novosibirsk, 1966), p. 28; Treadgold, p. 227.

[10] L.F. Skliarov, Pereselenie i Zemleustroistvo v Sibiri

(Continued next page)

(Table VI.3 Continued)

Gubernia or Oblast'	Percentage Increase from 1898 to 1912	
	Villages	Volost's
South of Siberia		
Semipalatinsk	71	45
Akmolinsk	108	96
Siberian Far East		
Amur	203	185
Primorskaia	90	109
Siberia Proper		
Zabaikal	94	28
Tobolsk	65	25
Tomsk	128	113
Yeniseysk	17	142
Irkutsk	75	45
Four Siberian Gubernias	59.8	60.7
Total	79	70

These figures suggest that the four Siberian gubernias (Tobolsk, Tomsk, Yeniseysk, Irkutsk) received a less than proportional share of expansion of number of settlements in comparison to the border regions to the west, south, and east of them. This is probably true. In 1898, the 4 Siberian

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10(Continued)
v Gody Stolypinskoi Agrarnoi Reformy (Migration and Land Use Structure in the Years of the Stolypin Agrarian Reform), (Leningrad, 1962), p. 471.

gubernias (Tomsk, Tobolsk, Yeniseysk, and Irkutsk) had 63.5% of the villages and 60.3% of all the volost's in the districts listed in the above table. By 1912, these shares had dropped to 61.9% and 58.4% respectively.[11]

The reasons for this are fairly obvious. The advantage of the oblast's west of Siberia proper was their proximity to European Russia; migrants did not have to travel as far to reach them. The districts south of Siberia proper held the rich steppe soil of Akmolinsk and Semipalatinsk oblast's. The districts to the east of Siberia proper give a false appearance of expansion in the table because they were so sparsely settled to begin with. They were all but inaccessible till the eastern sections of the Trans-Siberian Railway were opened between 1898 and 1900.

Now that we have established the general characteristics and significance of the migration movement, we may turn to the individual migrant himself and to his viewpoint on migration. The typical migrant was a peasant most likely from either the central agricultural region of European Russia--the provinces of Kursk, Tambov, Voronezh, and the fringes surrounding them--or from the middle Volga region chiefly Perm, Viatka, and Samara provinces.[12]

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[11]Skliarov, p. 471.

[12]Treadgold, p. 90.

There seems to have been an even chance that he had been a state peasant. "In Tomsk gubernia in 1894, 51.2% of immigrants had been state peasants; in the Altai okrug, 67.4%."[13]

If he migrated between 1889 and 1898, roughly four fifths of his fellow migrants had been members of self-sufficient peasant housholds with horses, cows, and other livestock.[14] Among migrant families surveyed by the contemporary investigator Kuznetsov, landholdings in European Russia were disposed of as follows: about 50% of the land was sold; about 21% had been rented out; and about 29% had reverted to the communes of which they had been members.[15]

There are a number of theories about the wealth levels of those who migrate. Briefly, one theory states that the poor migrate to new territories because they have the least

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[13]A.A. Kaufman, Pereselenie i Kolonozatsiia (Migration and Colonization), (Petersburg, 1905), p. 183. A state peasant was one who worked state-owned land and paid rent for the privelege.

[14]L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX (The Siberian Peasantry on the Edge of Two Centuries: The End of the Nineteenth-The Beginning of the Twentieth), (Novosibirsk, 1967), p. 68.

[15]V.K. Kuznetsov, compiler, Sbornik Statisticheskikh Svedenii ob Ekonomicheskom Polozhenii Pereselentsev v Sibiri (Collection of Statistical Information About the Economic Position of Migrants in Siberia), (Petersburg, 1912), Part I, p. 148.

to lose and the most to gain. Another theory suggests that the middle income and wealthy migrate successfullly because they have the means at their disposal. It is the former theory which is applicable to the "great Siberian migration." There can be little doubt that the migrants were land-poor and that land was the chief motivating economic factor in the migration. The following table gives a breakdown of the migrants of 1895 and 1896 into categories by their holdings at home in European Russia. Comparison of the figures for the migrants with the sample of non-migrants shows clearly that the migrants had less land than the neighbors which they left behind in European Russia.

Table VI.4: Share of Migrant Households in Categories of Landholding in European Russia.[16]

Landholding Category	1895 Migrants	1896 Migrants	Sample of Non-Migrants Remaining in European Russia
Landless	15.7%	18.9%	
0 to 2.7 acres	16.5%	13.8%	
2.7 to 8.1 acres	36.5%	31.8%	
8.1 o 13.5 acres	15.0%	17.4%	
0 to 13.5 acres	83.7%	81.9%	24.1%
13.5 to 27 acres	12.8%	14.4%	38.9%
over 27 acres	2.4%	3.1%	36.0%
Not Indicated	1.1%	0.6%	1.0%

[16] Treadgold, p. 93, 254; N.P. Oganovsky, compiler, Sel'skoe Khoziaistvo Rossii v XX Veke (The Rural Economy of Russia in the Twentieth Century), (Moscow, 1923), p.68-73. The sample of non-migrant households consists of all peasant households in the ten gubernias and oblast's of European Russia which had supplied the greatest number of migrants to Asiatic Russia up to 1897. The percentage figures for

These migrants had worked extremely small holdings at home. The 1895 migrants had worked an average of only 7.56 acres; those who arrived in 1896 had worked on average 8.1 acres back home. At this time the average allotment for all of European Russia was 29.7 acres. Migrant holdings of other agricultural assets had also been extremely small. For 1895 and 1896 migrants respectively, 22% and 24% had owned no livestock; 35% and 36%, no working stock; 43% and 46% had owned only one horse; and 18% and 21% had owned two or more horses.[17] Yet they were not completely without assets as the following table indicates.

Table VI.5: Percentages of Migrant Households Categorized by Cash Realized From Liquidation at Home in European Russia[18]

Sum Raised	1895 Migrants	1896 Migrants
0 to 50 rubles	12.8%	9.0%
50 to 100 rubles	26.3	23.1
100 to 200 rubles	30.2	38.6
200 to 300 rubles	13.8	16.0
over 300 rubles	16.9	13.3

16 (continued)
the non-migrants refer to 1905. The ten European Russian gubernias and oblast's in order of descending contribution to the migration to Asiatic Russia are as follows: Perm, Poltava, Kursk, Tambov, Voronezh, Chernigov, Samara, Viatka, Penze, and Riazan.

[17]Treadgold, p. 93.

[18]Treadgold, p. 94.

It should be apparent that, although the migrants were land-poor and with little livestock (since they did not have the land to support livestock), their other assets were not negligible. It should also be noted that less than a fifth of the migrants of 1895 and 1896 had the 300 ruble minimum needed to migrate and settle successfully before the railroad opened.[19] Yet the failure rate was certainly not anywhere near 80%. This suggests that the migrants were able to work their way to their destination and earn or borrow enough to set up an independent agricultural household. (On the other hand, it may only suggest that the migrants consistently understated their assets.)

The following table taken from the contemporary investigator Kuznetsov gives the capital held by migrants at home before they migrated and in Siberia at the time of settlement for those households studied by him. It should be noted that these figures are strongly biased upwards since Kuznetsov studied only established migrant households; some of them had been in Siberia for as long as 18 years. Those which had failed and returned to European Russia simply were not around to be interviewed, and these are precisely the ones most likely to have brought

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[19] See below.

the least capital with them. This group was probably of considerable size since Kuznetsov reports that one third of the migrants entering Siberia had no money.[20]

Table VI.6: Average of Assets Per Migrant Household by[21] Region of Settlement

Region		Ruble Value of Assets at Home	Ruble Value of Assets at Time of Settlement
I.	Steppe	196	162
II.	Wooded Steppe of Western Siberia	293	188
III.	Wooded Steppe of Eastern Siberia	250	168
IV.	Taiga	203	143

At the time of settlement, about half of these assets was in cash and half in the form of equipment and livestock. The American scholar Treadgold reports that migrants entering Siberia and the Far East in 1911 and 1912 had on average total assets of not quite 100 rubles per household including personal possessions and livestock.[22] The only apparent way to make these figures consistent with those in Table VI.6 above is to draw a distinction between "time of settlement" and "entering into Siberia." This would suggest that many cash-poor migrant families worked as agricultural laborers in Siberia to build up a stake before they actually settled on an allotment.

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[20]Kuznetsov, Part I, p. 46.

[21]Kuznetsov, Part I, p. 153.

[22]Treadgold, p. 30.

The cost of migration, of course, varied enormously with the size of the family, number of possessions, and distance to be travelled. In 1881, Mr. Iadrintsev, a government official, calculated the cost of migration as follows: 50 to 70 rubles for a wagon, 300 rubles for a pair of oxen, 40 to 50 rubles for enrollment in a Siberian commune, and 25 to 50 rubles for construction of a dwelling. There would also be further expenditures for seed, breeding stock, agricultural implements, plow-horses, and food before the first harvest. The total cost then came to between 300 and 500 rubles.[23] The total, I think, would more often approach 500 rubles, a large part of which would be spent on transport--a cart and a pair of oxen to pull it. All this changed drastically with the opening of the railway. In 1896, Kolumzin, a high-ranking Tsarist official, reported that a new-settler had to spend about 160 rubles on his homestead in Siberia: 40 rubles for a house, 80 rubles for a pair of horses and a cart, 15 rubles for a cow, 5 rubles for a plow, and 20 rubles for a sledge, harness, and other gear.[24] If we assume that transport costs by rail did not change much between 1896 and 1911-1912, then we may use Kuznetsov's claim that 78 rubles was spent in transit.[25] This suggests

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[23]Treadgold, p. 98.

[24]Treadgold, p. 118.

[25]Treadgold, p. 219.

that a peasant family given a free government allotment in Siberia could relocate and start farming with 238 rubles.[26] This free land allotment became increasingly important. In 1860, a family could join an old-settler commune for between 4 and 10 rubles per male; in the 1870's, the figure rose to 15 rubles; by the 1880's, 35 to 50 rubles; in the 1890's, it hit 70 rubles. In Tomsk gubernia in 1906, payment for one soul's allotment ranged between 40 to 60 rubles; between 1907 and 1912, the range was 100 to 200 rubles.[27]

In summary then, the financial requirements for migration and start-up costs were probably 300 to 500 rubles before the railroad and 250 rubles afterthe opening of the railroad provided a free government land allotment could be obtained. If land had to be purchased or a family with two males had to buy their way into an old-settler commune, another 140 to 400 rubles would be required (at 70 rubles per male soul allotment in the 1890's and up to 200 rubles per male soul allotment from 1907 to 1912.) These figures exceed the official estimate of the Migration Administration, which was 310 rubles. Local migration organizations set their estimates more realistically, I think, at 400 to 500 rubles

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[26]Compare this figure with those in Table VI.6 above.

[27]Skliarov, p. 436-437. "One Soul's Allotment" was the land allotment which each male commune member was allocated.

per family.[28] It should be noted, however, that these figures include the cost of obtaining an allotment or joining a peasant commune (which carried land allotment privileges) as well as purchase of the agricultural capital needed for independent farming. A comparison of these costs with migrant assets summarized in Table VI.6 above strongly suggests that in general migrant families could not take up indepencent farming upon arrival; thus, they had to offer their services on the agricultural labor market.

With these figures in mind, it is not surprising that some migrant families could not successfully establish themselves and were forced to return home. In 1882-1883, only fifteen out of every one thousand migrants returned to European Russia. In 1896, however, the share of returners rose to 11% and in 1897 to 18% of that year's officially recorded total of migrants. Of those who returned in 1897, 69% said that they had not had permission to migrate. Other reasons for returning were economic failure, death of the family head, or other calamity.[29] It would be reasonable to assume that those without permission to migrate had probably not registered for fear of detection; hence, their chances of obtaining a government allotment were greatly

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[28] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei (History of Siberia from Ancient Times to Our Days), Volume III: Sibir'v Epokhu Kapitalizma (Siberia in the Epoch of Capitalism), (Leningrad, 1968-1969), p. 304.

[29] Treadgold, p. 103.

reduced. If this was the case, then the jump in proportion of returners was probably due to the opening of the railroad, which provided a cheap means of escape from Siberia. Up to 1896 then, these unfortunates may have been "locked in" the old-settler communes as unenrolled and, therefore, landless laborers and sharecroppers.

The following table gives the Migration Administration's estimates of the percentage of migrants who moved within Siberia or returned to European Russia after they had received land allotments. It indicates considerable mobility even among supposedly settled migrants.

Table VI.7: Estimated Percentage of Migrants Who Moved After Receiving Allotments[30]

Gubernia	1910	1911
Tobolsk	6%	4.4%
Tomsk	5.3	2.2
Yeniseysk	12.6	9.2
Irkutsk	9.3	8.9

The investigators of the period evidently expended considerable energy searching for "the" factor which determined migrant success in setting up a viable household. The American scholar Treadgold presents a table of land tilled per migrant household and share of horse-owning

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[30] Skliarov, p. 445.

migrant households both at home and in Siberia by years.[31] The degree of improvement after migration increases noticeably for those who migrated after 1896. Treadgold attributes this improvement to increased government aid which was greatly extended in 1897. He seems to ignore the fact that 1897 was the first full year in which migrants could travel by rail. This factor alone decreased transport costs from 350 rubles (300 rubles for oxen and 50 rubles for a wagon) to 78 rubles per family. Treadgold goes on to review other factors which were offered as candidates for "the" most important factor determining migrant success. The contemporary investigator Kaufman, in a survey of Tomsk gubernia covering 1880 to 1894, demonstrated the importance of cash brought from European Russia for success in agriculture.

Table VI.8: Area Sown and Horses Owned by Migrant Households in Tomsk Gubernia in 1880-1894[32]

Category by Cash Brought from European Russia	Average Acres Sown	Share of Households Sowing Less Than 2.7 Acres	Share of Households Sowing More Than 27 Acre	Share With 0 or 1 Horse
None	7.6	35.5%	2.7%	43.2%
0-25 rubles	10.0	21.1	3.1	31.6
25-50 rubles	13.0	13.3	8.5	23.4
50-100 rubles	16.2	5.6	10.9	11.9
100-200 rubles	19.4	5.9	19.9	11.9
over 200 rubles	23.9	2.2	38.7	7.4

[31] Treadgold, p. 101.

[32] Treadgold, p. 102.

The Committee of the Siberian Railway, after studying the evidence, concluded that "the most important factor" determining migrant success was the amount of labor power available in the family as the following table demonstrates.

Table VI.9: Extent of Migrant Tillage by Number of Full-Time Workers Per Family[33]

Number of Workers	Average Sown Acres	Share Sowing Less Than 2.7 Acres	Share With 0 or 1 Horse
0-0.5 workers	5.1	56.7%	64.7%
1 worker	7.3	33.1	44.5
1.5-2.5 workers	13.8	13.2	19.8
3 or more workers	23.5	5.8	5.6

What the investigators failed to notice was the degree to which the various factors were both complementary and substitutable. They were complementary in that they tended to appear together; thus, a family with more workers was more likely to have more cash to bring to Siberia simply because it could earn more at home. The various factors were also substitutable in that a small but ambitious family could hire workers provided it had the money. There was no single factor which determined migrant success; rather, a large number of factors such as number of workers, money assets, government aid, availability of allotments, and

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[33]Treadgold, p. 102.

luck all contributed to the success or failure of the migrant family with the abundance of some factors compensating for the absence of others.

The effects of the "great Siberian migration" are intertwined with other factors in a complex chain of cause and effect; nevertheless, it may be useful to review the most obvious effects to impress upon the reader the importance of this phenomenon. The significance of the migration for population growth has already been chronicled. Agriculture underwent a tremendous expansion since the migration was largely a rural phenomenon. The immigrants occupied a large area of formerly empty land--almost 81 million acres between 1906 and 1910 alone.[34] Old-settlers, on the other hand, had lost a quarter of their land to the immigrant land fund.[35] Between 1907 and 1911, the increase in livestock and sown area for Asiatic Russia had been twice as large as the increase in population.[36] This suggests that agriculture changed qualitatively as well as expanded. This, indeed, seems to have been the case. Figures for sown area and land productivity were 20% to 30% higher for established migrants than for old-settlers as a group.[37] New crops such as flax and hemp were introduced; fertilizing

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[34]Treadgold, p. 206.

[35]Treadgold, p. 174.

[36]Treadgold, p. 228.

[37]Treadgold, p. 175.

with manure became more widespread; techniques of livestock breeding were advanced; and crop rotation schemes were introduced to replace the old system of working the land until it had to be abandoned to fallow.[38] In addition, the migrants brought with them between 1896 and 1916 not less than 150 million rubles.[39] They had also left behind some 5.4 million acres of good farmland in European Russia which became available to their land-poor neighbors.[40]

B. The Siberian Social Structure

There were three important factors in the Siberian social structure which contributed greatly to the agricultural development of the region: the peasant mir or "commune" in Siberia, the almost complete absence of a gentry class and serf tradition in Siberia, and the social and economic mobility which to a significant degree was made possible by the other two factors combined with the economic potential of Siberia.

1. The Peasant Mir

The Russian term mir is usually translated into English as "commune." This is unfortunate since the mir did not function as a commune. Peasants usually did not work in common fields or satisfy their needs from common storehouses.

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[38] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 310.

[39] M.I. Altshuller, Zemstvo v Sibiri (The Zemstvo in Siberia), (Tomsk, 1916), p. 68.

[40] Treadgold, p. 228.

The literal meaning of mir is "world," and, indeed, the mir was often as not the entire world for the peasant. He was born into it, lived, worked, and paid his taxes in it, and finally died in it.

Opinions about the Russian peasant mir or "commune" range from high approval to complete condemnation. Some intellectuals saw it as a yoke about the peasants' necks which prevented any one peasant from rising above the miserable state of his fellows; others saw it as a supremely Russian institution protecting the peasant from foreign influences. Up to the Revolution of 1905, the State considered the mir as an essential means of keeping the peasants on the land, taxing them, and keeping track of their movements. After 1905, the government reversed itself and condemned the mir as a hotbed of revolution and communism.

Whichever of these opinions may be true for the European Russian case, the mir in Siberia appears to have been a model of flexibility if not always of efficiency. Its influence on the lives of its members varied enormously with their needs and desires. At one extreme the mir might exist in name only with its members working their own parcels independently of each other much like North American homesteaders of the nineteenth century. At the other extreme the mir might be involved in almost every facet of village economic life. In almost all cases, however, the mir, under

local control, responded only to local needs and desires and was sufficiently flexible to respond quickly to changes in those needs and desires.

There were five major economic functions which the mir fulfilled in Siberia. (1) The mir acted as tax collector and adjuster for the Tsarist government. Taxes were usually levied as a lump sum on the entire mir on some basis such as the number of males or the area of arable land. It was then up to the mir to allocate the tax burden among its individual members. (2) The mir might also act as a mutual insurance society with the mir extending aid to any of its members who had suffered misfortune. (3) The mir also acted as a buffer between the local government bureaucracy and the individual peasant. This may not sound very important, but one must remember that the peasant was usually illiterate and at the mercy of government officials who were no strangers to corrupt practices. Nor was it uncommon for a peasant to be beaten for failing to pay his taxes. For these reasons, the buffer function of the mir was a very important one for its members. (4) Another function of the mir was the allocation of land, but the mir did not allocate all the land within its boundaries. In Siberia at least, the chief function of the mir in land allocation was to correct gross inequities in land holdings. As certain types of land became scarce, they reverted to mir control. The mir then either allocated it to the use of individual peasant households or

relegated it to common use depending on the needs of the community. Thus, in a crowded village almost all land might be allocated by the mir while another mir in a sparsely populated area with plenty of good land might not be involved in land allocation at all. (5) The mir also allowed small peasants to combine their resources to take advantage of economies of scale when the opportunity presented itself. Thus, the butter-making cooperatives which were the backbone of Siberia's butter industry were largely an outgrowth of the mir. The mir could also more easily obtain loans or purchase and use specialized agricultural machinery much more easily than could the individual peasant. Nor could the mir in Siberia fulfill those undesirable functions (from the points of view of personal freedom or factor mobility) which it apparently did in European Russia. The Siberian mir could not restrict peasant movements. In fact, Siberia was just too vast for any authority to restrict peasant movement within the region. Besides, the great migration brought an influx of immigrant peasants willing to buy membership in a mir. Nor could the mir effectively impose uniform planting schedules or crops on its members. A peasant who wished to experiment could do so as long as he did not use scarce lands needed by his fellow members. Besides, he could always move.

In summary then, the mir in Siberia was a very flexible institution highly responsive to local needs and conditions. And in Siberia the acute problem of land shortages, which had led to criticism of the mir in European Russia, had not yet appeared. The mir in Siberia had not yet been presented with problems it could not handle.

2. Absence of Serf Tradition

The mir was an important part of the Siberian social structure, but the mir was also a common institution in European Russia. The single most important feature of Siberian society which distinguished it from European Russian society was the complete absence of a serf tradition in Siberia. All but a handful of Siberia's peasantry had never known serfdom unless they had been serfs in European Russia. And without the serfs to support them, there could be no gentry class of noble-landowners.

There are at least two possible explanations for this phenomenon. The simplest is that Siberia was too forbidding for the Russian nobility. According to this theory, Siberian estates could have supported a leisure class, but the Russian gentry could not take the bitter cold and isolation. Alternatively, one might assert that opportunities for wealth and a good life in European Russia were a stronger pull to the Russian aristocracy than the economic opportunities to be found in Siberia. There is considerable validity in this

explanation, especially since there were plenty of state lands and peasants in European Russia which could be given to new nobles. But there is also the possibility that Siberia would have developed its own landed gentry.

A much more interesting explanation for the absence of serfdom and a gentry class in Siberia can be found in an hypothesis advanced by E.D. Domar.[41] Stated briefly, the hypothesis asserts that there are three factors which cannot exist simultaneously: a leisure class which draws its income from the surplus produced by a land-working class, free land, and mobility of labor--specifically, mobility of those who work the land. In other words, in order to be able to extract a surplus from a laboring group, one must be able to restrict their movements sufficiently to take it away from them or deny them free access to some productive factor--in this case, land. Neither of these alternatives was generally possible in the Siberia of the early nineteenth century. In many districts land was quite literally a free good: a peasant "owned" whatever land he used and lost ownership only by discontinuing use. As for the alternative of tying the peasants down and restricting their movements--this was quite impossible. Siberia was ready-made for the fugitive. Sparsely settled and with immense distances, it

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[41] E.D. Domar, "The Causes of Slavery: A Hypothesis," The Journal of Economic History, Vol. XXX (March, 1970), p. 18-32.

could easily and often did swallow up whole groups or even villages of peasants. For these reasons, a Siberian leisure class living off a surplus extracted from the peasantry simply was not viable.

The history of Tsarist attempts to establish the nobility in Siberia bear out the above theory. Such attempts date from the eighteenth century at least and were all miserable failures. Sources differ on the exact number of serfs present in Siberia at any one time; however, even the largest estimates I have come across are extremely small. The Russian scholar Golovachev, writing in 1905, claims that Siberia held at a maximum some 3,700 serfs. Nine hundred of these were household servants while the remaining 2,800 lived as peasants on 36 estates. Twenty-eight of these estates were in Tobolsk gubernia; 6 in Tomsk; and 2 in Yeniseysk gubernia.[42]

But even these figures are open to question since they are apparently based on official statistics dealing with official status. Because of the availability of land and the safety from pursuit afforded by the great distances in Siberia, it is doubtful that even these 2,800 peasant "serfs" would have remained on the 36 estates if they had actually been treated as serfs. One of the few tourists to cross Siberia in the middle 1800's reported that he had heard of

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[42]L.M. Golovachev, "Chastnoe Zemlevladenie v Sibiri" (Individual Landownership in Siberia), Sibirskie Voprosi (Siberian Questions), Vol. I, (Petersburg, 1905), p.133-134.

only one pomeschik (noble landowner) in Siberia who had actually exercised his legal right to levy payments from his "serfs." The pomeschik was promptly murdered.[43]

The consequences of this failure of serfdom to take hold in Siberia were substantial. Siberia had no aristocracy of landed gentry. Its upper classes were composed of government officials, soldiers, and a few businessmen. The peasantry then did not have to contend with paternalism, benign or otherwise, in the field of agriculture. This freedom combined with Siberia's demanding conditions for survival meant that Siberian society "... came to represent a freer and more democratic social system than the one across the Urals and to exhibit certain qualities of sturdiness and independence often associated with the American frontier."[44]

3. Economic Mobility in Siberia

It is difficult to classify the question of economic mobility in Siberia as either a facet of the general economic development of the region or as part of the social fabric upon which agricultural development of necessity was based. Economic mobility was certainly a function of government aid to those at the bottom of the economic ladder and the willingness and ability of those at the bottom to raise themselves up economically. These aspects of the question

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[43]Michie, The Siberian Overland Route from Peking to Petersburg, (London, 1864), p. 324.

[44]Nicholas V. Riasanovsky, A History of Russia, (New York, 1963), p. 215-216.

definitely belong to following chapters on the government and peasant roles in Siberian agricultural development. There is also the question, however, of whether or not migration to Siberia was completely successful for the new-settler. Was he allowed to blend into his social environment by his neighbors after a few years--much like a Canadian immigrant to the United States would be? Or would it take two or three generations for the peasant family from European Russia to become Siberian--just as it took that long for Eastern European immigrants to the United States to become Americanized? To this extent, the question of economic mobility has an exogenous element since there could have been non-economic factors which provided a basis for discrimination and, thus, prevented upward economic movement for many new-settlers. For this reason, it is appropriate at this point to investigate the extent and means of upward economic mobility open to new-settlers.

There was little reason to expect any kind of discrimination in Siberia against immigrant peasants from European Russia. They were of the same race, nationality, and religion as the old-settler residents in Siberia. They also spoke the same language and followed generally the same customs and occupations. Nevertheless, there has been some concern over the ability of new-settlers to adapt to Siberian conditions and prosper. Contemporary

Russian scholars produced a number of studies commissioned by the Tsarist government to determine how successfully migrants to Siberia were adapting to their new physical and social environments.[45] The government was very much afraid that the flood of migrants would overwhelm the ability of the Siberian agricultural sector to absorb them and result in a large pool of unattached and unemployed peasants who might prove politically disruptive. A few contemporary Soviet scholars have also addressed themselves to the

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[45]See especially the following: A.A. Kaufman, Khoziaistvennoe Polozhenie Pereselentsev, Vodvorennikh na Kazennikh Zemliakh Tomskoi Gubernii (Economic Position of Migrants Installed on State Lands of Tomsk Gubernia), (Petersburg, 1896); A.A. Kaufman, Pereselenie i Kolonozatsiia (Migration and Colonization), (Petersburg, 1 1905); A.A. Kaufman, Sbornik Statei: Obschina, Pereselenie, Statistika (A Collection of Articles: The Community, Migration, Statistics), (Moscow, 1915); V.K. Kuznetsov, Sbornik Statisticheskikh Svedenii ob Ekonomicheskom Polozhenii Pereselentsev v Sibiri (Collection of Statistical Information About the Economic Position of Migrants in Siberia), (Petersburg, 1912); V. Ia. Nagnibed, Sbornik Statisticheskikh Svedenii ob Ekonomicheskom Polozhenii Pereselentsev v Tomskoi Gubernii (Collection of Statistical Information About the Economic Position of Migrants in Tomsk Gubernia), (Tomsk, 1913).

question of the conomic mobility of new immigrants to Siberia before World War I.[46]

Their general conclusion, however, was that most migrants from European Russia to Siberia were trapped at the bottom of the economic ladder. Unable to accumulate the capital necessary to become independent farmers, they had no alternative but to subsist as agricultural laborers and submit to economic exploitation by their kulak old-settler employers. The validity of this claim will be investigated below by looking as much as is possible at the agricultural labor force participation rate and agricultural capital accumulation of new-settlers as compared to that of old-settlers. The Siberian agricultural labor market, wages, and accumulation of agricultural capital in general will be discussed in following chapters.

Especially before the opening of the railroad, many new settlers supplied labor on the Siberian agricultural

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[46]See especially the following: L.F. Skliarov, Pereselenie i Zemleustroistvo v Sibiri v Gody Stolypinskoi Agrarnoi Reformy (Migration and Land-Use Structure in the Years of the Stolypin Agrarian Reform), (Leningrad, 1962); V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria (The Siberian Village on the Eve of October), (Novosibirsk, 1966); L.M. Goriushkin, Sibirskoe Krestianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX (The Siberian Peasantry on the Edge of Two Centuries: The End of the Nineteenth-The Beginning of the Twentieth), (Novosibirsk, 1967); L.M. Goriushkin, Sotsialno-Ekonomicheskie Predposylki Sotsialisticheskoi Revoliutsii v Sibirskoi Derevnie (The Socio-Economic Preconditions of the Socialist Revolution in the Siberian Village), (Novosibirsk, 1962).

labor market.[47] In 1894, a study was made of 18,521 new-settler households in the Altai okrug. 10,633 of those studied had registered and presumably received the full benefits of government aid; 6,233, on the other hand, had not registered for undisclosed reasons. Of those who had registered, 10.4% had members who had hired out as agricultural laborers; the same figure for the unregistered households was 22.3%[48] When the same housholds were grouped by term of residence in Siberia, it was found that 23.1% of those households in residence from 0 to 3 years supplied workers for hire; of those which had been settled for 3 to 5 years, 14.3% supplied laborers; of households which had been established for at least 5 years, only 6.6% sent workers onto the market.[49] The same pattern in the middle 1890's could be seen in neighboring Tomsk gubernia. There, on Kabinet lands, the share of migrant households supplying agricultural labor on the market was 61% for those registered and 64% for the unregistered which had been settled in their new homes for a year or less. For those households which had been established at least 5 years, the figures dropped

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[47]This is consistent with the fact that the costs of migration were much higher before the opening of the railroad than after. Since more assets were used up in transit before 1896, the need to work for ready cash upon arrival was greater ceteris paribus.

[48]A.A. Kaufman, Pereselenie i Kolonozatsiia, p. 293.

[49]A.A. Kaufman, Pereselenie i Kolonozatsiia, p. 292.

to between 56% and 39% for registered and to between 52% and 47% for unregistered households. As high as these figures may be, they are exceeded by counterpart figures for migrant households settling on State lands. 81% of households in the first 2 years of residence supplied agricultural laborers to the market; even after 8 years of residence, the figure was 53% for combined registered and unregistered migrant households.[50]

Unfortunately, no counterpart figures are available for old-settlers which may be compared with those in the preceding paragraph. However, a study was made in 1886-1887 of 2,477 peasant households located in 60 villages of Turinsk okrug in Tobolsk gubernia. So its figures are for an area well northwest of Altai okrug and Tomsk gubernia and for a time 7-8 years before the figures cited above; nevertheless, some comparison may be enlightening. This study revealed that out of every 100 peasant households, regardless of time of settlement, 4.4 supplied workers hired for a year or more; 8.3 supplied workers hired for shorter terms; 18.7 supplied workers hired by the day or to complete a specific task; and 5.4 had to send workers outside their

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[50] A.A. Kaufman, Khoziaistvennoe Polozhenie Pereselentsev, Vodvorennikh na Kazennikh Zemliakh Tomskoi Gubernii, Vol. II, Part I, p. 238, 334.

own volosts to find suitable employment.[51] Assuming that all these workers were employed in the agricultural sector, the total still adds up to only 36.8% of peasant households supplying laborers on the agricultural labor market. A similar study for Tiukalinsk okrug, which is adjacent to Tomsk gubernia, revealed that some 33% of all peasant households supplied workers on the labor market.[52]

Although it is dangerous to rest conclusions on such slender evidence as that presented in the above paragraphs, the temptation is too much for me since the conclusion is so reasonable: new-settlers entered the agricultural labor market almost solely to earn enough to purchase the inventory needed to become self-employed peasants working their own plots. If one reads the above 2 paragraphs again, a number of patterns emerges. First, there is a geographical pattern. In the fertile steppes of the Altai where the least inventory is needed to set up an independent peasant houshold, less than a quarter of new-settler households sell their labor power since it is much easier to work one's own land soon after settlement. As we move farther north into the wooded steppe of Tomsk gubernia, the growing season is a little

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[51] L.M. Goriushkin, Sibirskoe Krestianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, p. 79.

[52] L.M. Goriushkin, Sibirskoe Krestianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, p. 80.

shorter and the land a little harder to work: at least half of even established new-settler households must still hire out laborers since they lack the equipment necessary to completely employ their members on their own allotments. Second, there is a pattern in the supplying of labor by registered and unregistered households--a distinction which corresponds roughly to eligibility for government aid and the government's assessment of their ability to migrate successfully (assuming that many failed to register to avoid detection since they had left European Russia without official permission). A slightly larger proportion of the unregistered households supply workers on the agricultural labor market. This difference in behavior between registered and unregistered households can most reasonably be explained by postulating the same goal for both types--the establishment of independent self-employing peasant households--but different advantages in achieving this goal. The registered households had easier access to whatever government aid was available at the time. The third pattern is a pattern over time. In any given area, there is evident an inverse relation between term of residence and participation as suppliers in the agricultural labor market: the longer any group of households has been settled, the smaller the proportion of its members which supply labor to other households. The participation rate of households as suppliers in the labor

market reaches its lower limit in the old-settler group (or in studies which failed to distinguish between old and new-settlers), which by definition has been established the longest. We can add to these figures the personal impressions of many of the investigators of the migration movement into Siberia. In all the sources which have come to my attention dealing with the motivations for migration, 2 reasons appear over and over again: personal freedom and the availability of land. Not once have I seen higher wages given as an important motive for migrating to Siberia. The conclusion seems (to me) inevitable: new-settlers entered the agriculuural labor market to obtain a fixed sum--whatever they needed to buy the inventory necessary to become self-employed peasant farmers.

There is not sufficient information available to determine the shares of old-settlers, voluntary new-settlers, and exiles in the Siberian market for hired agricultural labor. However, some sources do comment on the shares of these groups. One source notes that half of all the workers in Yeniseysk gubernia in 1917 were migrants.[53] Tiukavkin, the Soviet scholar, claims that most of the agricultural laborers were new-settlers. In Yeniseysk gubernia they

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[53]L.M. Goriushkin, Sotsialno-Ekonomicheskie Predposylki Sotsialisticheskoi Revoliutsii v Sibirskoi Derevnie, p. 76.

made up half of the agricultural labor force while an additional 40% was composed of old-settlers. The remaining 10% or so were migrants from other gubernias of Siberia. He further notes that in Tomsk gubernia in 1914 an absolute majority of hired agricultural laborers was supplied by new-settler households.[54]

On the other hand, old-settler agricultural laborers are said to have predominated in Tobolsk and Irkutsk gubernias where their share in the agricultural labor force was roughly commensurate with the old-settler share in the total population.[55] I have not been able to arrive at a satisfactory explanation for this difference.

Data on the participation of Siberian households grouped by sown area in the market for hired agricultural labor would also be of interest. Unfortunately, such data are limited to intensive studies of small areas and usually cover only a year or two. Nevertheless, two examples are included here. Such data are of interest since they provide at least a partial test of the hypothesis that new-settlers (and even some old-settlers) hired themselves out only to accumulate sufficient capital to become independent farmers.

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[54] V.G. Tiukavkin, Sibirskaia Derevnia Nakanunee Oktiabria, p. 284.

[55] V.G. Tiukavkin, Sibirskaia Derevian Nakanunee Oktiabria, p. 285.

If this was the case, then one would expect to find some peasant households in the transitional phase between agricultural proletariat and independent farming households. Such transitional households would sow an area of intermediate size and yet hire out some agricultural labor. The existence of such intermediate households is not proof that there was upward economic mobility for new-settlers working as hired laborers since these intermediate households might not be in transition, but merely households stationary in a middle-class economic position. Yet the absence of such intermediate households would be strong evidence that the transition from agricultural proletarian to independent farmer was a very rare phenomenon.

The first of the two examples included here involves a sample of households from Slavgorod uezd in the extreme west of Tomsk gubernia in 1911-1912. The table below is self-explanatory.

We are further provided with the information that the poor households (averaging 10.8 sown acres) averaged 1.6 working members per household. These workers were employed outside their own households 4.5 months out of the year; this is the approximate term of the busy agricultural season in Siberia.[56] Another study of peasants -- in the Altai in 1917 -- showed similar relations between area sown and the supply of labor for hire.

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[56]Goriushkin, Sibirskoe Krest'ianstvo, p. 123.

Table VI.10: Labor Supplied by Households of Slavgorod[57] Uezd of Tomsk Gubernia in 1911-1912 Grouped by Average Sown Area Per Household

Average Sown Area Per Household	Number of Households in Group	Per Cent of Households in Group	Per Cent of Group Supplying Labor	Average Number of Workdays Supplied Per Household
10.8 acres	147	43.4	75.7	201
21.6 acres	166	48.7	30.1	78
42.9 acres	18	5.3	-	-
90.2 acres	10	2.6	-	-
Total	341*	100.0*	47.5*	125*

(*Calculated by me.)

Table VI.11: Percentages of Hired Workers Supplied by[58] Households in Altai Gubernia in 1917 Grouped by Area Sown

Sown Area Per Household	Per Cent of Hired Workers Supplied by Households in This Group
0-10.8 acres	83.3
10.8-27 acres	12.0
over 27 acres	4.7

Both these tables indicate the expected result: an inverse relation between work to be done in one's own household (represented by sown area per household) and the labor for hire supplied by that household. It should also be

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[57] Goriushkin, Sibirskoe Krestianstvo, p. 123.

[58] Goriushkin, Sibirskoe Krestianstvo, p. 108; Goriushkin, Sotsialno-Ekonomicheskie Predposylki, p. 100. Tomsk gubernia was subdivided in 1917; roughtly the southern third became Altai gubernia.

noted that a middle group of households (supplying some hired labor and sowing a respectable area of land) did exist. Their presence is at least consistent with the above claim that new-settlers hired themselves out almost solely to accumulate the price of inventory necessary for agricultural self-employment. This middle group is, thus, interpreted to represent the transitional stage from agricultural laborer to self-employed peasant. The absence of this middle group would be serious evidence against my hypothesis.

Data on agricultural wage levels will be presented and discussed in detail in Chapter IX, Section D below; nevertheless, it is appropriate here to briefly discuss wage levels with particular reference to the laborer's ability to save. The Soviet scholar, Sklyarov, addressing himself directly to the problem of the start-up costs of a new peasant household, assures his readers that in the 1880's and 1890's a migrant and his wife could by hiring themselves out as agricultural laborers earn between 120 and 150 rubles in a single summer. By fall, such a family could accumulate some inventory and be ready to sow a small area.[59]

Goriushkin, another Soviet scholar, reports further that the average pay for a male farm laborer in 1913 in

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[59]Skliarov, p. 414.

Siberia was 180 rubles per year; for a woman, 135 rubles per year; and for a youth, 124 rubles per year. A man could maintain himself and another adult at that wage level.[60]

The evidence in favor of a substantial savings capacity for hired agricultural labor in Siberia is strong. Not even Soviet sources claim that the agricultural laborer was paid a "subsistence" wage. Reports on labor supply in both official and unofficial sources generally refer to a labor shortage, not to the glut of wage laborers one would expect if many of the new-settlers were unable to set up independent agricultural households. In summary, all the evidence which has come to my attention points to the conclusion that employment in the Siberian agricultural labor market was for most both temporary and a stepping-stone to the establishment of independent agricultural households--not a pit of despair from which escape to a better life was virtually impossible.

More evidence for this conclusion may be had by comparing the distributions of agricultural capital among new-settlers and old-settlers. As usual, data of the type desired are unavailable and we must be staisfied with an intensive study of an extremely small area. The results

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[60]Goriushkin, Sibirskoe Krest'ianstvo, p. 100.

of such a study are recorded in Table 2 in the Appendix to this Chapter. It covers the distribution of agricultural capital among old-settler and new-settler peasants grouped by sown area in four uezds of Tomsk gubernia in 1912-1913. New-settlers were those who arrived in Siberia after 1896. The Soviet scholar Tiukavkin, who put Appendix Table 2 together, intended it to show that the kulak class (by his definition, those sowing more than 24.3 acres) among both old and new-settlers had amassed in their possession shares of agricultural capital much larger than either their shares of peasant households or of peasant population. The following table (Table VI.12) and approximate Lorenz curves (Figures VI.1 to VI.4) are derived from Appendix Table 2. Two conclusions should be clear from them. 1) Table VI.12 shows that although old-settlers had a larger share of sown area and agricultural capital than their shares of total households or population warranted, new-settlers as a group were by no means impoverished. 2) Figures VI.1 to VI.4 show that the distribution of sown area and agricultural capital among new-settlers was extremely similar to that among old-settlers. This suggests that new-settlers were in the process of falling into the old-settler patterns of capital and sown area distribution and, indeed, had made remarkable progress in that direction considering that migration had peaked in 1908--only four years earlier.

Figure VI.1: Lorenz Curves Showing Comparative Distribution of Sown Area Among Old-Settlers and New-Settlers in Four Uezds of Tomsk Gubernia in 1912-1913. (Based on Appendix Table 2.)

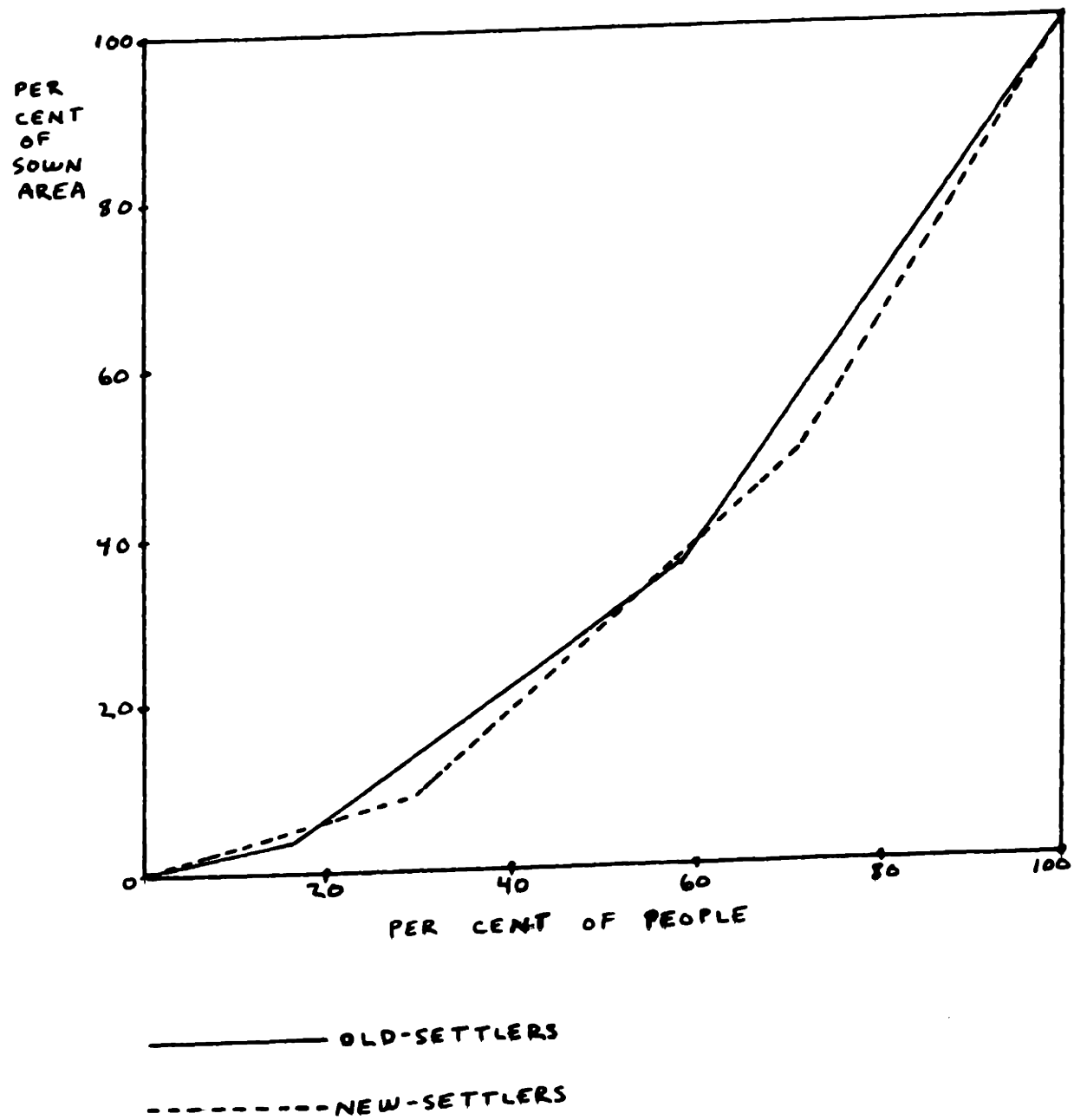

Figure VI.2: Lorenz Curves Showing Comparative Distribution of Working Horses Among Old-Settlers and New-Settlers in Four Uezds of Tomsk Gubernia in 1912-1913 (Based on Appendix Table 2.)

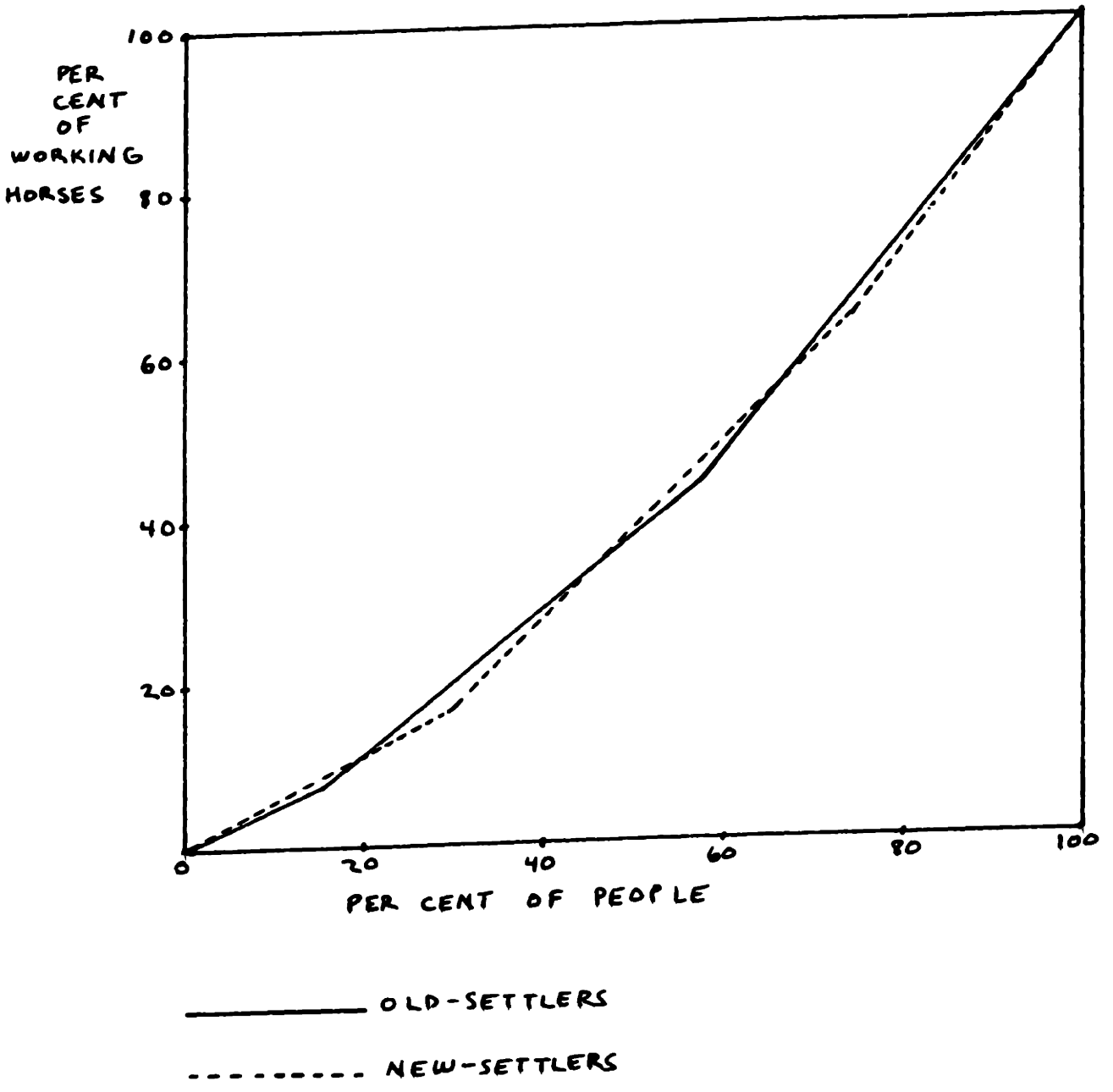

Figure VI.3: Lorenz Curves Showing Comparative Distribution of Milk Cows Among Old-Settlers and New-Settlers in Four Uezds of Tomsk Gubernia in 1912-1913 (Based on Appendix Table 2.)

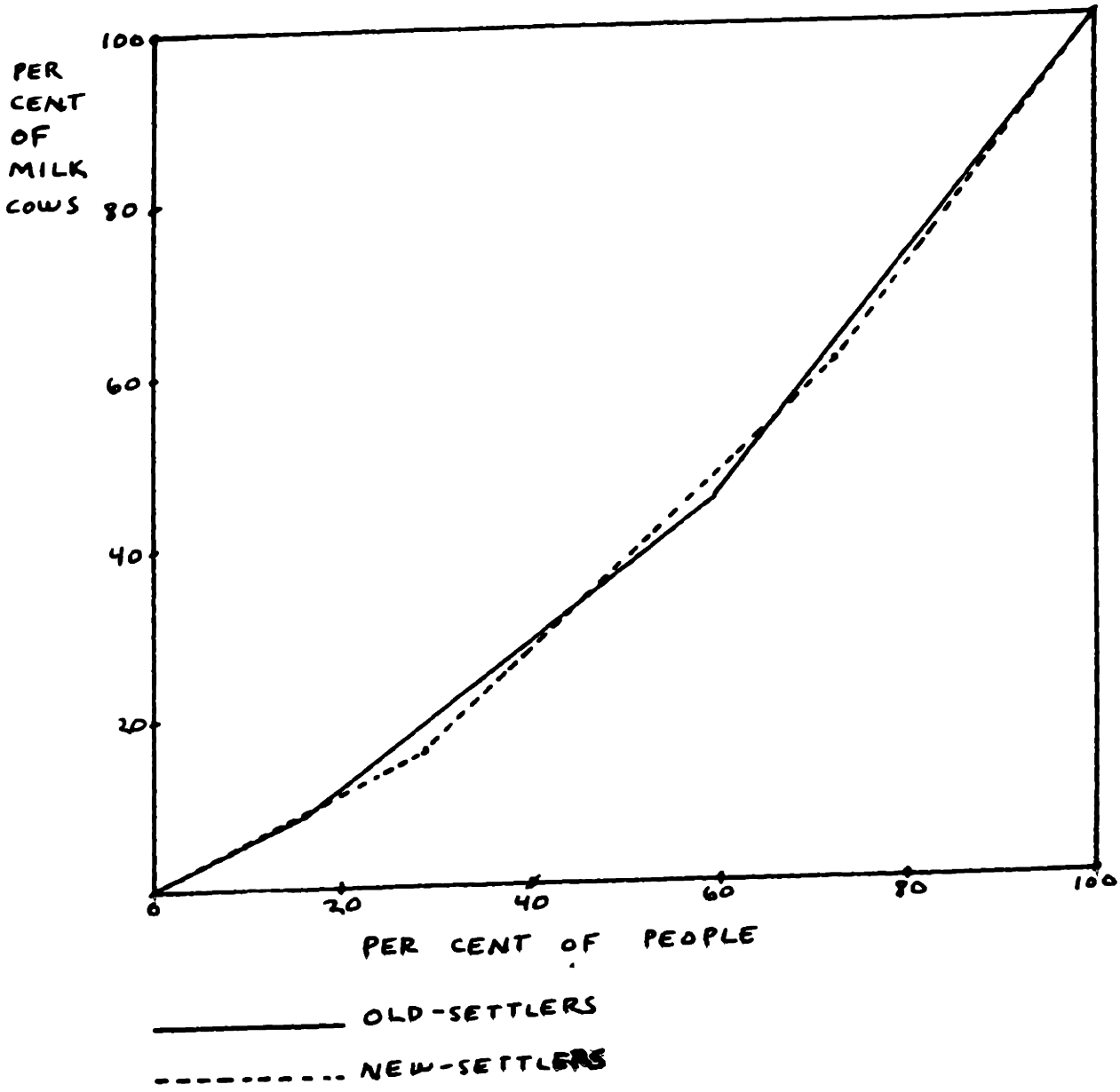

Figure VI.4: Lorenz Curves Showing Comparative Distribution of Agricultural Equipment Among Old-Settlers and New-Settlers in Four Uezds of Tomsk Gubernia in 1912-1913 (Based on Appendix Table 2.)

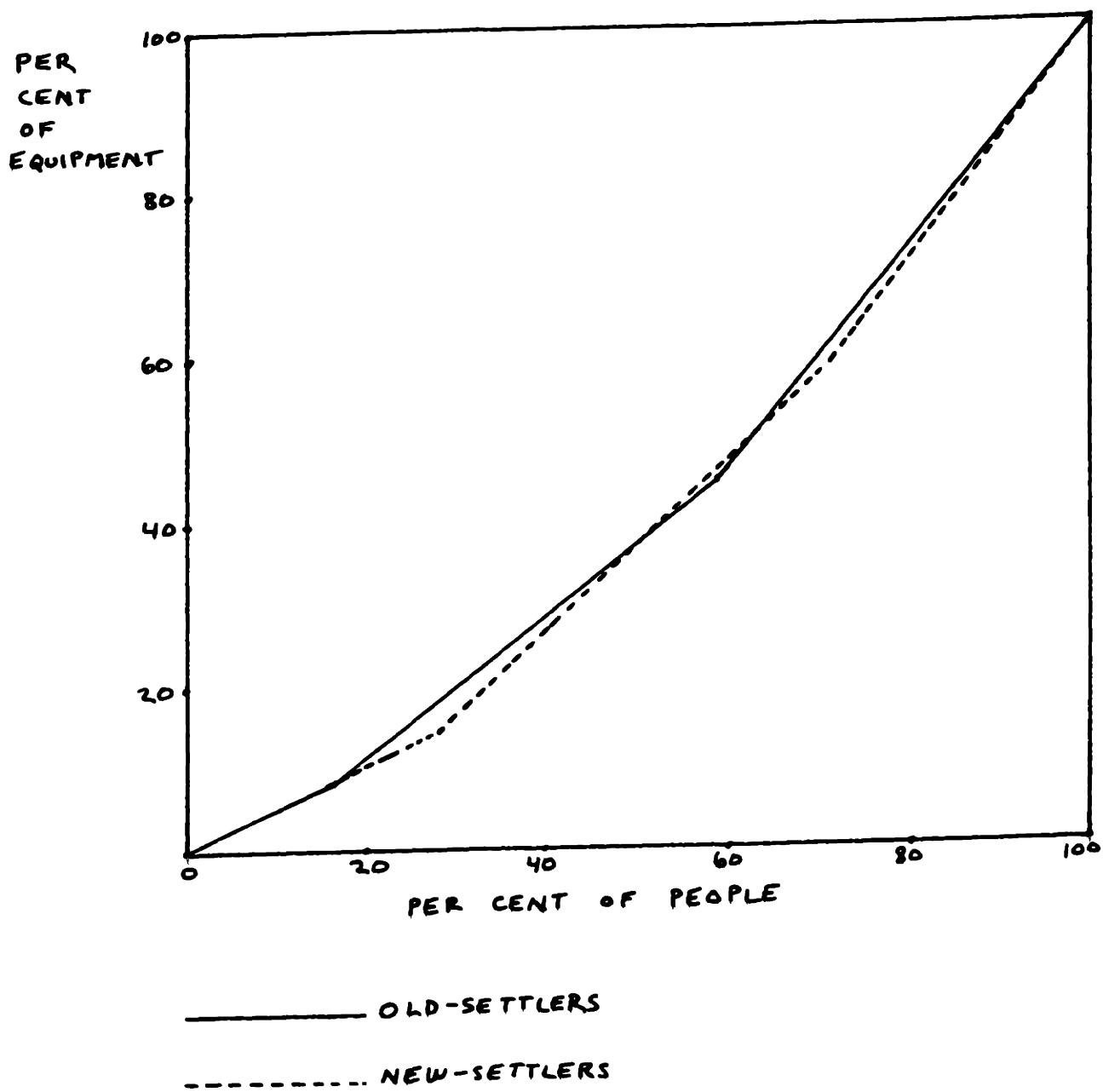

Table VI.12: Shares of Households, Population, and Agricultural Capital Among Old-Settlers and New-Settlers in Four Uezds of Tomsk Gubernia in 1912-1913[61]

Item	Old Settler Share	New-Settler Share
Households	52%	48%
Population	51%	49%
Area Sown to Crops	60%	40%
Working Horses	63%	37%
Milk Cows	65%	35%
Pieces of Agricultural Equipment	61%	39%

Appendix Table 2 is also of interest, however, since it is one of the few available which includes totals of sown area for each class division of peasant households. Thus, figures for population, livestock, and equipment per unit of sown area may be calculated. These figures are reported in Appendix Table 3.

One is strongly tempted to call the figures in Appendix Table 3 labor-land and capital-land ratios, but this would be misleading since all three factors were rented or hired across the lines separating the peasants into groups. Nevertheless, the figures are not without interest. The old-settler group has fewer people per sown acre except in

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[61]See Appendix Table 2.

the group sowing 0 to 8.1 acres. One would naturally expect old-settlers in general to have higher per capita incomes than new-settlers since the former have been established longer. Sown area per head is a good proxy for per capita income except in those groups which planted little; these groups derived a larger proportion of their income from non-agricultural activities. In other words, old-settlers in the 0-to-8.1-acre group were not poorer than new-settlers: they merely farmed less. Old-settlers, regardless of sown area group, also had more working horses, cows, wooden plows, and hay-mowing machines than new-settlers. The old-settlers' advantage over the new-settlers in capital-land ratios is not so uniform in transport vehicles and reaping and binding machines, and they are actually at a net disadvantage to the new-settlers in iron plows and threshing machines. Thus, the theory that new-settlers were capital-starved and obliged to rent from old-settlers who had a virtual monopoly on expensive agricultural capital cannot be accepted at face value. Admittedly, Appendix Table 3 refers to only four uezds of Tomsk gubernia for 1912-1913 and conclusions drawn from it cannot be applied to the rest of Siberia for the entire period from 1890 to 1917. Nevertheless, the theory of old-settler supremacy in capital ownership has at least one counterexample.

However, this counterexample combined with all the other information supplied in this section is strong evidence

that economic mobility in Siberia was not a problem for the new-settler. He was evidently afforded the same opp opportunities as the old-settler and these opportunities were sufficient to allow him to become an independent farmer within a few years after his arrival and settlement in Siberia.

C. Technical Progress

There were a number of technical factors originating outside the agricultural sector which deserve particular mention for their contribution to Siberian agricultural development. Most of these will be discussed in greater detail in later chapters, but they are mentioned here because of their essentially exogenous character.

The most obvious of these technical factors was the Trans-Siberian Railway. It is still the longest railroad in the world and its construction under Siberian conditions was no mean feat of technology. The railroad connected Siberia with world markets and allowed both the export of grain, butter, meat, and other products and the import of agricultural and other machinery and equipment. It also greatly facilitated migration. The introduction in 1899 and extensive use of the finest refrigerator cars in Europe was especially important for the increase in Siberian exports of butter and frozen meat.

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[62]Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria, p. 353.

Technical progress was also an important feature in grain growing--specifically with regard to agricultural capital. During the period from 1890 to 1917 agricultural capital was improved in two basic ways. One was the introduction of new types of equipment such as the reaping and binding machine. The new machinery not only saved labor, but also allowed specific tasks to be completed in a shorter period of time. This increased the effective length of the growing season--a very important consequence for Siberian agriculture. The other way was the replacement of home-made often wooden implements and parts with factory-machined iron and steel ones. This cut down drastically on replacement needs and maintenance costs. The multiple-plowshare, steel-tipped iron plow is a good example of both these advantages. It needed repairs and new parts less often than the old wooden sokha (a popular Russian plow). It also made the first plowing of virgin soil much easier and faster since it was subject to less friction or "drag" with the ground. In addition, the peasant could adjust the depth of the furrow to the needs of each particular field.

The Siberian butter industry also received an important stimulus from technical innovation. This was the introduction of the mechanical separator which was used in the first

butter-making plant opened in Tiumen okrug of Tobolsk gubernia in 1886.[63] Butter-making was changed from a cottage industry to a factory-plant operation, although a crude one. Working at home, the Siberian peasant could produce approximately one pound of butter from 40 pounds of milk.[64] The yield from the mechanical separator was approximately one pound of butter from twenty-one pounds of milk depending on the butterfat content of the milk.[65] This almost doubled the butter productivity of milk. Butter-making received a second stimulus when it was found that it was a joint-product activity. The "waste"--buttermilk and sour milk--generated in butter-making were used in Siberia to fatten hogs. Thus, Siberian butter-making had a large and prosperous satellite industry--pig raising.[66]

These were the chief technical advances which contributed greatly to Siberian agricultural development: the Trans-Siberian Railway and the refrigerator car, new

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[63]Goriushkin, Sibirskoe Krestianstvo, p. 158.

[64]Goriushkin, Sibirskoe Krestianstvo, p. 158

[65]Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria, p. 353.

[66]Goriushkin, Sibirskoe Krestianstvo, p. 167; Treadgold, p. 179.

agricultural machinery and the use of factory-machined metal parts and implements, the mechanical separator, and the use of butter-making waste to fatten hogs.

D. The Disruptions of War and Revolution

The political events of the period 1914 to 1922 affected Siberian agriculture in three ways: the commandeering of Siberian human and material resources for the war effort, the breakdown of Siberia's trade link with the outside world, and finally the disruption of agriculture in Siberia during the Civil War.

Some information on the commandeering of Siberian resources for the war effort has already been presented.[67] The Russian demand for Siberian agricultural products increased markedly with the outbreak of World War I, most of the increase stemming from the needs of the military. Needless to say, such an increase in demand for output alone would have been a blessing for Siberian agriculture. It was, however, accompanied by a need for manpower. According to the Ministry of Internal Affairs and the Rural Economic Census of 1917, almost 50% of the working men of Siberia were drafted.[68] There was also a rapid

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[67] See Chapter III.

[68] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 440.

inflation which affected relative price levels. The average wage for agricultural labor in Siberia is reported to have jumped 13% to 20% over 1915 alone. The increase in prices for agricultural products for the same year was 40% to 80%. The inflation continued into 1916.[69]

Of greater consequence for Siberian agriculture was the cutting of its trade link with the outside world. This link involved rail transport from Siberia to ports in European Russia and then shipment by sea. The German namy controlled the Baltic Sea and shipment through the Black Sea was impossible when Turkey joined the Central Powers in autumn, 1914.[70] Butter was the commodity which suffered the most precipitous decline. Before the War, about 80% of Siberia's total production was shipped to Western Europe via the Baltic ports.[71] After the opening of hostilities the basic markets were Petrograd (from which some butter was shipped to Finland), Kotlas (from which some was shipped to England), and the army.[72] From 1913 to 1914, Siberia's butter exports to foreign countries declined by more than 42%.[73] Total sales rebounded in 1915

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[69] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 447.

[70] Riasanovsky, p. 464.

[71] Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria, p. 365.

[72] Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria, p. 378.

[73] See Table III.2 in Chapter III.

with the surge in domestic demand only to fall again in 1916 when transport to European Russia also broke down. The breakdown was due to overloading of the single-track Trans-Siberian Railway and the extensive use of it and the European Russian network for military needs as well as to the polical turmoil of the times. The seriousness of the breakdown is reflected in the price differential between Siberia and European Russia.

Table VI.13: Prices for One Pood (36.113 pounds) of Siberian Butter in Rubles[74]

Month and Year	Omsk	Petersburg
April 1916	18.50	35.50
September 1916	28.50	71.50

Siberian butter was never to recover its former position of prominence in the world market.

Rail shipments of Siberian grain westward also declined between 1913 and 1914, but by a relatively moderate (when compared to butter) 23%.[75] The effect of the War on the Siberian grain industry was not nearly as bad as it was on the Siberian butter industry. Table 15 in the Appendix to Chapter III shows that grain exports to the west by rail peaked in 1915 and then declined to slightly below their

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[74] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 443.

[75] See Table 15 in the Appendix to Chapter III.

their 1911 level. Siberian grain had been heavily dependent on foreign markets. Although about a third of the grain which left Siberia also went to foreign markets, the increased demands of the military easily absorbed this amount. The breakdown in shipping after 1915, however, led to heavy stockpiling of grain in Siberia. In 1916, Siberian grain reserves totalled 11,532,600 tons or more than twice the total 1913 harvest. After the 1917 harvest, these surpluses increased further to 12,132,000 tons.[76]

Data on shipments of meat and animals from Siberia for the War years do not allow one to calculate percentage changes in annual shipments. One must look instead at livestock totals in Siberia for the years in question. The available information on these totals has already been reported in Tables 26 through 34 in the Appendix to Chapter III. Figures in Table 26 indicate that between 1912 and 1916 the total number of animals in Siberia increased by 113%. The total declined in 1917, but was still 73% more than the 1912 level. One would expect a nation to run down its capital stock including domestic animals in time of war. However, in the Siberian case animals and animal products could not reach their markets in European Russia and beyond, so herds were simply allowed to increase naturally until, it was hoped, stability returned.

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[76]Goriushkin, Sotsial'no-Ekonomicheskie Predposylki, p. 61.

While the breakdown in rail transport led to the accumulation of livestock in Siberia, it must have had the opposite effect on the stock of agricultural equipment. Unfortunately, the only equipment totals available for Siberia as a whole including the War and Revolution are for the years 1910 and 1920. Between these years, stocks of factory-made agricultural equipment in Siberia roughly doubled.[77] Much of this increase must have occurred before the War, however. After the Revolution, the Commissariat of Agriculture of the RSFSR estimated that in 1917 only 63% of Siberia's agricultural equipment was in full working order and that those pieces that were in good repair were less than half the total number needed.[78] This figure indicates the unavailability of spare parts.

The effects of the War on the distribution of agricultural capital in Siberia are difficult to determine. Information is incomplete, sometimes conflicting, and often obviously edited to prove a point. Alferov, a Soviet scholar, paints a picture of disaster. He reports a survey of some 600 migrant households conducted in 1917 which registered 41% of families with no dwellings, 70% with no livestock,

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[77] See Table III.15 in Chapter III.

[78] Goriushkin, Sibirskoe Kresti'ianstvo, p. 117.

[79] M.S. Alferov, Krest'ianstvo Sibiri v 1917 Godu (The Peasantry of Siberia in 1917), (Novosibirsk, 1958), p. 10.

and 94% with no agricultural equipment of any kind.[80]

This capital-poor group was supposedly counterbalanced by a small capital-rich kulak class. The 1917 census estimated that of some 1,657,000 peasant households in Siberia and in the Far East only 3.5% (58,000) owned multiple-plowshare iron plows, 3.2% owned seeding machines, 7.5% owned reaping machines, and 9% owned hay-mowing machines.[81] One could reasonably expect the War to lead to greater inequality in the distribution of agricultural capital among the Siberian peasantry simply because of the breakdown in transport services. Peasants who were in a position to buy factory-made equipment for the first time could obtain it only with great difficulty. Livestock herds, as noted above, were simply allowed to increase (provided their owners could feed them) since they could not reach their European Russian markets. Hence, few of those who did not own machinery before the War could obtain it while those who owned large numbers of animals before the War could not market them and they allowed their herds to increase naturally if they could support them.

The last table to be presented in this section refers to a census conducted in 1920 involving 171,900 households of Western Siberia and 132,000 households of Eastern Siberia.

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[80] Alferov, p. 18.

[81] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 445.

Table VI.14: Percentages of Households Grouped by Acres Sown Without Cows and Working Stock in Western and Eastern Siberia in 1920

Limits of Sown Area in Acres	Western Siberia: Per Cent of Households	Per Cent with No Working Stock	Per Cent with No Cows
0-2.7	19.2	71.3	52.7
2.7-10.8	29.6	15.3	19.0
10.8-27	36.3	2.2	7.6
27-43.2	10.5	0.3	1.6
43.2-67.5	3.4	0.4	1.1
over 67.5	1.0	0.1	0.3
0 or more	100.0	9.4	8.4

Limits of Sown Area in Acres	Eastern Siberia: Per Cent of Households	Per Cent with No Working Stock	Per Cent with No Cows
0-2.7	26.6	62.7	53.8
2.7-10.8	42.2	5.9	12.4
10.8-27	26.4	0.6	3.5
27-43.2	4.0	0.2	1.0
43.2-67.5	0.7	0.4	1.4
over 67.5	0.1	-	-
0 or more	100.0	9.3	9.3

These figures do not suggest as bleak a picture as Alferov does.

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[82] Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria, p. 173.

The percentage shares of households without working stock and cows drops dramatically as we cross from the 0-2.7 acre group into the other groups. It should be remembered that peasant households with little sown acreage were not necessarily destitute; many of them simply were not farmers. One curious phenomenon which I cannot explain is the temporary increase in percentages of households without working stock (in both Western and Eastern Siberia) and without cows (in Eastern Siberia only) as sown area increases from 27-43.2 acres to 43.2-67.5 acres.

As bad as the draft, disruption of transport, and loss of markets had been for Siberia, the region had been lucky up to the Bolshevik Revolution in that it had not sustained direct damage. The Bolshevik Revolution brought confusion to Siberia, and the Civil War brought the actual fighting. In 1918 the Trans-Siberian Railway was captured by Czechoslovak prisoners of war who sought to escape Russia via the Pacific. The Czechs fought the Bolsheviks along the railroad. At the same time, an anti-Bolshevik government was established at Omsk in Western Siberia and taken over by Admiral Kolchak. In addition, interventionist forces from fourteen countries including Japan, Great Britain, France, and the United States landed at Vladivostok. Japanese troops occupied the Russian part of Sakhalin Island and much of Siberia east of Lake Baikal. In October 1919 the Red Army took the offensive against

Kolchak's forces east of the Urals and by the end of 1920 had gained control of most of Siberia east of Lake Baikal. Allied intervention also ended in that year with only the Japanese remaining in Amur and Primorskaia oblast's until 1922, on the Kamchatka Peninsula until 1923, and on northern Sakhalin until 1925.[83]

Over the quarter century before World War I, Siberia had become the world's leading exporter of butter and the dominant supplier of meat on the major urban markets of European Russia; Siberian grain production had been less important but still significant. The breakdown of transport, the disruption of civil war, and the permanent loss of world markets due to efforts to isolate Bolshevik Russia led to stagnation of Siberian agriculture from which the region was never to recover completely.

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[83]Riasanovsky, p. 532-536.

Appendix to Chapter VI

Estimates of Total Migration

The Soviet historian Obolenshky-Osinsky, as noted in footnote 2 in Chapter VI, Section A, estimates that unregistered migrants to all of Asiatic Russia did not exceed 700,000 for the entire period from 1801 to 1914. Thus, his maximum estimate for the migration into all of Asiatic Russia from 1801 to 1914 is 6,400,000. This figure includes prisoners and exiles since many of them settled down, lived normal lives, and remained in Siberia even after their sentences had expired. The American historian Treadgold constructs his own table from various sources; he gives the total number of migrants and scouts[1] entering Siberia between 1887 and 1913 as 5,375,353.[2] The modern Soviet historian Skliarov, using only official settlement data on the other hand, comes up with a total flow of migration into all of Asiatic Russia between 1896 and 1914 of only 3,982,268, of whom 683,869 or 17.1% are reported

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[1] A scout was a peasant sent by a group of peasants from European Russia to Asiatic Russia to find suitable parcels of land for the group.

[2] D.W. Treadgold, The Great Siberian Migration, (Princeton, 1957), p. 34.

to have given up and returned.[3] The most recent general history of Siberia published by the Soviet Academy of Sciences set migration into Siberia between 1906 and 1914 at 3,040,333 of whom 529,835 or 10.8% are said to have returned. In addition, over the same period 731,827 scouts are said to have entered Siberia of whom 235,039 supposedly never returned to report back to the peasant groups which had originally sent them. This gives a grand total for 1906 to 1914 of only 2,745,537 migrants and scouts who entered Siberia and remained there.[4]

The only fact clear from this litany of figures is that it is virtually impossible to fix the actual size of Siberian migration. If forced to set rough limits to its magnitude, I would say that the great Siberian migration from 1801 to 1917 involved between five million and seven million people. In spite of the apparent exactness of the figures in their tables, none of the sources can really be trusted. Russian peasants refused to move through bureaucratic channels and moved

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[3] L.F. Skliarov, Pereselenie i Zemleustroistvo v Sibiri v Gody Stolypinskoi Agrarnoi Reformy (Migration and Land-Use Structure in the Years of the Stolypin Agrarian Reform), (Leningrad, 1962), p. 453.

[4] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei (History of Siberia from Ancient Times to Our Days), Vol.III, Sibir'v Epokhu Kapitalizma (Siberia in the Epoch of Capitalism), (Leningrad, 1968-1969), p. 308.

in spite of bureaucratic obstacles. Many of them moved a number of times within Siberia; thus, at one point Treadgold says that half of the "returners" never returned to European Russia but relocated in Siberia. Also, two thirds of the "returners" between 1896 and 1909 had left European Russia illegally and many of these had never registered in Siberia.[5] So, according to official statistics, they were leaving Siberia without ever having entered it.

Table 1: Population Growth in Four Siberian Gubernias in Thousands

Years	Siberian Population Growth in Thousands Gubernias				
	Tobolsk	Tomsk	Yeniseysk	Irkutsk	Total
1. According to census of 1897:					
Urban	86.6	136.6	61.1	62.8	346.6
Rural	1,347.0	1,791.8	509.1	452.1	4,100.0
Total	1,433.6	1,927.9	570.2	514.9	4,446.6
2. On January 1, 1906:					
Urban	89.6	184.0	65.9	65.0	404.5
Rural	1,567.1	2,228.7	592.0	487.7	4,875.5
Total	1,656.7	2,412.7	657.9	552.7	5,280.0
Growth from 1897 to 1905	223.1	484.8	87.7*	37.8	833.4
Migrants in that number	96.9	335.4	118.8*	12.4	563.5
Migrants % of Total Growth	43.4	69.1	135.5	32.8	67.6

(Continued)

[5]Treadgold, p. 173.

(Table 1 Continued)

Siberian Population Growth in Thousands

Years	Gubernias				
	Tobolsk	Tomsk	Yeniseysk	Irkutsk	Total
3. On January 1, 1915:					
Urban	154.9	363.0	152.2	156.2	826.3
Rural	1,930.8	3,690.7	991.7	665.6	7,278.8
Total	2,085.7	4,053.7	1,143.9	821.8	8,105.1
Growth from 1906 to 1914	429.0	1,641.0	486.0	269.1	2,825.1
Migrants in that number	150.5	979.8	223.5	80.4	1,434.2
Migrants % of total growth	35.0	59.7	45.9	29.8	50.7
4. Total growth 1897 to 1914	652.1	2,125.8	573.7	306.9	3,658.5
Migrants in that number	247.4	1,315.2	342.4	92.8	1,997.8
Migrants % of total growth	37.9	61.8	59.6	30.2	54.6
5. Index of Population on January 1, 1906 (1897 = 100)					
Urban	103.4	135.1	107.8	103.5	116.7
Rural	116.3	124.3	116.2	107.8	118.9
Both sectors	115.5	125.0	115.3	107.3	118.7
6. Index of Population on January 1, 1915 (1906 = 100)					
Urban	172.8	197.2	230.9	240.3	204.2
Rural	123.2	165.5	167.5	136.4	149.2
Both sectors	125.8	168.0	173.8	148.6	153.5

(Continued)

(Table 1 Continued)

(*Footnote: These official statistics imply that immigration exceeded total population growth between 1897 and 1905. This is logically possible, but highly unlikely.)

Source: L.F. Skliarov, Pereselenie i Zemleustroistvo v Sibiri v Gody Stolypinskoi Agrarnoi Reformy (Migration and Land-Use Structure in the Years of the Stolypin Agrarian Reform), (Leningrad, 1962), p. 469.

Table 2: Distribution of Agricultural Capital and Sown Area Among Old-Settler and New-Settler Peasants Grouped by Sown Area in Four Uezds of Tomsk Gubernia in 1912-1913

Sown Area in Acres	Number of Households Absolute	Per Cent	Number of People Absolute	Per Cent
Old-Settlers:				
0-8.1	755	24	3,123	17
8.1-24.3	1,386	44	7,753	42
over 24.3	1,020	32	7,672	41
0 or more	3,161	100	18,548	100
New-Settlers:				
0-8.1	1,026	36	5,112	29
8.1-24.3	1,254	44	7,736	44
over 24.3	582	20	4,940	27
0 or more	2,862	100	17,788	100
All Settlers:				
0-8.1	1,781	29	8,235	23
8.1-24.3	2,640	44	15,489	42
over 24.3	1,602	27	12,612	35
0 or more	6,023	100	36,336	100

(Continued)

(Table 2 Continued)

Sown Area in Acres	Total Desiatinas Sown--- Absolute	Per Cent	Working Horses------ Absolute	Per Cent
Old-Settlers:				
0-8.1	892	4	969	8
8.1-24.3	8,049	32	4,446	37
over 24.3	16,104	64	6,511	55
0 or more	25,045	100	11,926	100
New-Settlers:				
0-8.1	1,567	9	1,107	16
8.1-24.3	7,109	42	3,249	46
over 24.3	8,367	49	2,743	38
0 or more	17,043	100	7,099	100
All Settlers:				
0-8.1	2,459	6	2,076	11
8.1-24.3	15,158	36	7,695	41
over 24.3	24,471	58	9,254	48
0 or more	42,088	100	19,025	100

Sown Area in Acres	Milk Cows---------- Absolute	Per Cent	Pieces Per Household Transport Vehicles	Wooden Plows
Old-Settlers:				
0-8.1	1,051	9	2.11	0.13
8.1-24.3	4,056	35	4.55	0.37
over 24.3	6,295	56	9.35	0.37
0 or more	11,402	100		
New Settlers:				
0-8.1	1,006	16	1.74	0.06
8.1-24.3	2,733	45	3.80	0.17
over 24.3	2,375	39	6.74	0.19
0 or more	6,114	100		

(Table 2 Continued)

Sown Area in Acres	Milk Cows		Pieces Per Household	
	Absolute	Per Cent	Transport Vehicles	Wooden Plows
All Settlers:				
0-8.1	2,057	12		
8.1-24.3	6,789	37		
over 24.3	8,670	51		
0 or more	17,516	100		

Sown Area	Pieces of Euipment Per Household			
	Iron Plows	Hay-Mowing Machines	Reaping and Binding Machines	Threshing Machines
Old-Settlers:				
0-8.1	0.11	0.003	0.01	0.004
8.1-243.	0.63	0.08	0.03	0.02
over 24.3	1.06	0.36	0.33	0.22
New-Settlers:				
0-8.1	0.20	0.003	0.005	0.001
8.1-24.3	0.80	0.06	0.04	0.06
over 24.3	1.25	0.25	0.34	0.30

Source: V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria (The Siberian Village on the Eve of October), (Novos-birsk, 1966), p. 149-150. A new-settler is one who arrived in Siberia after 1896.

Table 3: Population and Agricultural Capital Per Acre of Sown Area Among Old-Settler and New-Settler Peasants Grouped by Sown Area in Four Uezds of Tomsk Gubernia in 1912-1913

Limits of Sown Area in Acres	Settler Group	People	Working Horses	Milk Cows
0-8.1	old	1.296	0.402	0.436
0-8.1	new	1.208	0.261	0.237
0-8.1	both	1.240	0.312	0.309
8.1-24.3	old	0.356	0.204	0.186
8.1-24.3	new	0.403	0.169	0.142
8.1-24.3	both	0.378	0.188	0.165
over 24.3	old	0.176	0.149	0.144
over 24.3	new	0.218	0.121	0.105
over 24.3	both	0.190	0.140	0.131
0 or more	old	0.274	0.176	0.168
0 or more	new	0.386	0.154	0.132
0 or more	both	0.319	0.167	0.154

Limits of Sown Area in Acres	Settler Group	Transport Vehicles	Wooden Plows	Iron Plows
0-8.1	old	0.661	0.040	0.034
0-8.1	new	0.734	0.014	0.048
0-8.1	both	0.707	0.024	0.043
8.1-24.3	old	0.290	0.023	0.040
8.1-24.3	new	0.248	0.011	0.052
8.1-24.3	both	0.270	0.017	0.045
over 24.3	old	0.219	0.008	0.024
over 24.3	new	0.173	0.004	0.032
over 24.3	both	0.203	0.007	0.027
0 or more	old	0.257	0.014	0.030
0 or more	new	0.256	0.008	0.042
0 or more	both	0.257	0.012	0.034

(Continued)

(Table 3 Continued)

Limits of Sown Area in Acres	Settler Group	Hay-mowing Machines	Reaping and Binding Machines	Threshing Machines
0-8.1	old	0.000	0.003	0.001
0-8.1	new	0.000	0.001	0.000
0-8.1	both	0.000	0.001	0.000
8.1-24.3	old	0.005	0.001	0.001
8.1-24.3	new	0.003	0.002	0.003
8.1-24.3	both	0.004	0.002	0.002
over 24.3	old	0.008	0.007	0.005
over 24.3	new	0.006	0.008	0.007
over 24.3	both	0.007	0.008	0.006
0 or more	old	0.008	0.005	0.003
0 or more	new	0.004	0.005	0.005
0 or more	both	0.006	0.005	0.004

Source: Based on Appendix Table 2 above.

Chapter VII. Government Policies Concerning Siberian Development in General

The policies of the Tsarist government relating to Siberian agricultural development may be divided for the sake of convenience into two groups: general policies which had important effects on agriculture and policies instituted specifically to promote or direct agricultural development in the region. The former will be discussed in this chapter while the latter will be covered in Chapter VIII below.

There were three aspects of government policy which, although not directly aimed at agriculture, were important determinants in its development: migration policy, railroad policy, and the tax burden on the Siberian peasantry.

A. Migration Policy

Up until 1843, the movement of Russians into Siberia had involved soldiers, Cossacks, officials, prisoners, exiles, and miners--but few peasants. The peasantry, tied to the land as serfs or state peasants, had not been free to move at will. Beginning in 1843, however, peasants in land-poor villages in European Russia were permitted to migrate to Siberia with government approval. Upon arrival at their destination, they might qualify for 94.5 acres of land, monetary aid, temporary tax relief, and freedom

from conscription.[1] The process of obtaining permission to migrate was a long and arduous one. The peasant had to pay all his debts and his share of his commune's tax burden one year in advance. He then applied for permission to leave his commune. Once this was granted, he had to be accepted as a resident in a Siberian commune. Only then could he leave for Siberia. Those peasants with the patience and resources to go through this process were called "regular" migrants. They received the full advantages of the government's blessing: a government land allotment, financial aid, and temporary relief from tax and other obligations. Those who simply sold out and left for Siberia were called "irregulars," and the American scholar Treadgold even claims that their numbers almost equalled the number of regular migrants.[2] At first, irregulars were given neither land allotments nor aid of any kind. They did, however, have the advantage of squatting on as good a plot as they could find (and as large as they could use) and had effective tax relief until they were found out. Siberian officials eventually realized that their

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[1]D.W. Treadgold, The Great Siberian Migration, (Princeton, 1957), p. 29.

[2]Treadgold, p. 30.

cooperation with their fellow bureaucrats in European Russia only resulted in squatting and misery, which might be relieved if irregulars could apply for aid and government allotments. As early as 1842, 842 irregular migrants[3] were granted land allotments but no loans or exemptions from taxes in Siberia.

While a peasant was classified "regular" or "irregular" depending on whether he left his home in European Russia legally or illegally, he could be "registered" or "unregistered" upon his arrival in Siberia. By registering he made his presence known to the Siberian bureaucracy. Thus, he took on all the privileges and obligations of an officially recognized Siberian peasant. He might be eligible for a government land allotment, loans, and temporary exemption from certain taxes and the draft. On the other hand, he would have to pay full taxes and be subject to the draft eventually. The unregistered migrant had no privileges or obligations until he was found out. The only penalty for failure to register was immediate registration. Before 1885, Siberian officials had refused to register irregular migrants. Ostensibly, this was in

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[3]When referring to pre-1861, this is a sanitized term for "runaway serfs." This expression should impress upon the reader the significance of such aid being supplied by the Siberian bureaucracy. It would be akin to the granting of homesteads to runaway slaves by northern officials in the pre-Civil War United States.

cooperation with officials in European Russia--irregular migrants were not to be granted the rights and privileges of bona fide residents. Another motive may simply have been to hide from the eyes of the Tsarist government the degree to which Siberia had become a haven for runaways.[4] The only problem with this policy was that the Siberian bureaucracy was ignoring the very existence of approximately half of the new residents--even for tax purposes. Finally in 1885 all pretenses were dropped and Siberian officials began to register both regular and irregular migrants and made almost no ditinction in aid offered to the two groups. As a result, in 1890 and 1891, the migrant registration point at Tomsk reported that 70% and 66% respectively of all migrants were irregulars. For the same years the Tobolsk migrant registration point reported 80% and 70% of all registered migrants as irregulars.[5] There was also a sizable but uncounted group of migrants who were both irregular and unregistered. Such figures indicate the inability of the government to control the flow of migrants. They could not be prevented from leaving European Russia, and Siberian officials were finally forced simply to ignore the fact that they had broken the law and migrated illegally.

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[4]Before 1861, serfs; after 1861, peasants.

[5]Treadgold, p. 80.

Chapter VI, Section A and the Appendix to Chapter VI have already established the inability of the Tsarist government to count accurately the migrants entering Siberia, much less control or direct their movements. Peasants entered Siberia as scouts ostensibly looking for suitable sites for new villages; this decreased official restrictions on their movements. The "scouts" quite often then simply disappeared from official view. Peasants accepted government bonuses in European Russia for their willingness to settle in the isolated but politically important Far East. They then crossed the Urals by rail but left the train somewhere along the 4,000 miles between the Urals and their destination and were never officially heard from again. Government attempts to close certain areas to new migration (They were supposedly all filled up.) had little effect on the inflow of new migrants. Peasants might also ignore official allotment boundaries or simply squat on unsurveyed lands. In short, the peasants usually moved wherever they wished and whenever they wished. The government, unable to keep track of their movements, could neither direct nor regulate migration to any significant degree. It was quite common for laws concerning migration to be ignored by the peasantry from the outset. When attempts to enforce the law proved ineffective, penalties were minimized; later, infractions

were simply ignored. Finally, the law was repealed since it was feared that the peasants might become too accustomed to ignoring the law or that otherwise law-abiding peasants might be denied government aid for breaking a law that was generally ignored anyway. Such peasants, unable to become independent without a government loan or other assistance, then became permanent wards of the State. This is precisely the pattern which the laws regarding the registration of irregular migrants followed.

Although government efforts to regulate migration by simple fiat were largely ineffective, government aid to migrants was significant and was an important inducement for new migrants to register with the authorities in Siberia. This aid took three forms: exemption from conscription and certain taxes; eligibility for a government land allotment; and in some cases, government loans to aid individual peasant households to establish themselves in agriculture. Of course, none of these aids were available to the unregistered migrant household in Siberia.

The first form of aid, instituted in 1904, involved complete exemption from military conscription and the state-obrok tax for the first five years of residence in Siberia and fifty per cent exemption from the state-obrok tax for the second five years of residence.[6] The value of

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[6]More will be said on taxes, including definitions, in Section C below.

the tax exemptions to the new-settler household varied from region to region as the following table indicates.

Table VIII.1: Value of Exemption from State-*Obrok* Tax to[7] New-Settler Households in Various Regions of Siberia in 1911-1912

Region	*Obrok* Tax as Share of Total Tax Burden	Average Tax Burden Per New-Settler Household in Rubles	Average *Obrok* Tax in Rubles Per New-Settler Household
Steppe or Plains	17.7%	12.00	2.12
Western Siberian Wooded Steppe	32.5%	10.42	3.37
Eastern Siberian Wooded Steppe	8.8%	8.45	0.74
Taiga or Forest	12.0%	7.27	0.87
Average	19.2%		

While there can be little doubt that exemption from the draft was of great value to the new-settler, exemption from the state-*obrok* tax was not very significant. It involved at best less than two per cent of the gross annual income

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[7] V.K. Kuznetsov, *Sbornik Statisticheskikh Svedenii ob Ekonomicheskom Polozhenii Pereselentsev v Sibiri* (Collection of Statistical Information About the Economic Position of Migrants in Siberia), (Petersburg, 1912), Part I, p. 133.

of a male agricultural worker.[8] The variation in taxes apparent in Table VII.1 was the result of the imperfect tax allocation and collection system in Siberia.

The privilege of obtaining a free land allotment from the government was of very significant value, however. All that was required to obtain one was to be an officially registered new-settler in Siberia. It was also necessary, of course, that the government have an allotment available.

Most of those migrants who registered received allotments while those who failed to register most often had to either buy an allotment from another migrant or buy their way into an old-settler commune. Between 1910 and 1915 alone, the Migration Administration counted over 400,000 unregistered migrants who were granted no allotments.[9] Those peasants who could neither obtain a government allotment nor afford the enrollment fee of an old-settler commune apparently found themselves barely hanging on to the bottom rung of the economic ladder. Even in the late 1880's, a survey of Yeniseysk gubernia showed that those peasants who remained in old-settler villages without enrollment had 2 to 2 1/2 times fewer horses and 1 1/2 to 3 times fewer acres sown than those who had enrolled.

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[8]The average annual wage of a male agricultural worker in Siberia was reported to be 180 rubles in Chapter III, Section B above.

[9]L.F. Skliarov, Pereselenie i Zemleustroistvo v Sibiri v Gody Stolypinskoi Agrarnoi Reformy (Migration and Land-Use Structure in the Years of the Stolypin Agrarian Reform), (Leningrad, 1962), p. 440.

By 1893-94, the Altai district counted 150,000 unenrolled migrants tilling on the average 11.0 acres per family. At the same time, other new-settler families were averaging 31.3 acres of sown area.[10] These figures alone can tell us nothing of the economic possibilities of the unregistered landless migrant. He may have simply remained in the old-settler commune until he had worked long enough to save up the enrollment fee. Whatever the eventual outcome of his situation, there can be little doubt that the unregistered migrant would have been better off if he had been able either to obtain a free allotment from the government or move far enough out to be able to work unclaimed land.

Besides his own savings, the major source of capital available to the peasant migrant was the government loan. A comparison of the figures given in different sources suggests that there was a difference between the amounts of loans authorized by the ogvernment and the amounts acutally received by the peasants--the former being considerably higher than the latter. The law of July 13, 1889 set a loan maximum of thirty rubles per family without special approval. In cases of hardship, loans of up to one hundred rubles per family could be specially approved. These loans could be repaid without interest over a ten-

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[10]Treadgold, p. 103.

year period.[11] The American scholar Treadgold sets the average amount of loans granted in the middle 1890's at between sixty and seventy rubles per family.[12] The contemporary investigator Kaufman reported that the average in Tomsk gubernia was 83 rubles per family; in Tobolsk gubernia, 113 rubles; in Yeniseysk gubernia, 77 rubles; and in Irkutsk gubernia, 92 rubles.[13] In 1903, the maximum in Primorskaia oblast' (in the Far East) was raised to 150 rubles per family. In 1908, it was again raised to 200 rubles in the Far East and 165 rubles per family elsewhere.[14]

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[11] Treadgold, p. 79.

[12] Treadgold, p. 118.

[13] A.A. Kaufman, Pereselenie i Kolonozatsiia (Migration and Colonization), (Petersburg, 1905), p. 94. The 113 ruble figure for Tobolsk gubernia exceeds the 100 ruble limit imposed by the law of July 13, 1889. Obviously, either Kaufman was mistaken or the legal limit was ignored.

[14] Pereselenie i Zemleustroistvo za Uralom v 1906-1910 gg. (Migration and Land-Use Structure Beyond the Urals in 1906-1910), (Petersburg, 1911), p. 31.

The Soviet Academy of Science, in its most recent general history of Siberia, claims that loan operations were poorly organized and costly to the peasants. Loans were supposedly granted chiefly as travellers' aid, for church construction, surveying, and equipment. Many loans involved only 2 to 5 rubles. In 1906 to 1910, apparently due to a policy change, the average family loan totalled only 30 to 60 rubles and was granted in installments of 5, 10, or 15 rubles for which the peasant had to leave his work, travel to the administration center, and pay his keep in an inn while he waited for his money.[15] In 1911, the total amounts of such loans are reported to have jumped to 80 to 100 rubles per family.[16] In 1913, loan operations underwent a reform. Siberia was divided into 7 districts depending on soil and climate conditions and proximity to the railroad. The maximum amount of loans was then tied to residence in one of these districts. A resident in the first district close to the railroad and with good soil and favorable (for Siberia) climate could

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[15] Istoriia Sibiri s Drevneishikh Vremen do Nashikh Dnei, Vol. III, Sibir'v Epokhu Kapitalizma (History of Siberia from Ancient Times to Our Days, Vol. III, Siberia in the Epoch of Capitalism), (Leningrad, 1968-1969), p. 304.

[16] Istoriia Sibiri s Drevneishikh Vremen do Nashikh Dnei, Vol. III, p. 309.

get no loans at all. At the other extreme, a seventh district resident might be loaned a maximum of 400 rubles.[17] Thus, between 1909 and 1914, the average amounts of loans per family in the 4 Siberian gubernias were as follows: Tomsk, 67 rubles; Tobolsk, 93 rubles; Yeniseysk, 89 rubles; and Irkutsk, 98 rubles.[18] Thus, the government was absorbing part of the extra cost of settling in areas less suitable for agriculture or farther from the railroad. It should also be noted that these loans were made available only to migrants, not to relocating old-settlers or to old-settlers starting new households.

Although there is some conflict among the loan amounts in the above paragraphs, the general totals of peasant financial needs and available assets are roughly consistent. A peasant family which left home with 239 rubles, travelled cheaply by rail, received a government land allotment and a 30 ruble loan would have 269 rubles. The capital requirement for such a family was given as 250 rubles minimum in Chapter VI, Section A.

Thus, although the government loan program was not terribly generous, it apparently could mean the crucial

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[17]Skliarov, p. 352.

[18]Skliarov, p. 355.

difference between success and failure for the marginal migrant family attempting to establish an independent agricultural household in Siberia.[19]

Although the Tsarist government had little influence over the voluntary migration into Siberia, it completely controlled the movement of the involuntary migrants--prisoners and exiles. The share of prisoners and exiles in total migration from 1801 to 1914 has already been estimated at 17%.[20] These involuntary migrants played a significant role in Siberian agricultural development through their participation in the market for hired agricultural labor.

By the 1890's, Siberia held about 200,000 exile-settlers of which 60,000 lived in Tobolsk gubernia, 30,000 in Tomsk, 45,000 in Yeniseysk, 40,000 in Irkutsk,

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[19]Unfortunately, there is no way of determining even approximately how many families received aid or in what amounts. Although sources in previous footnotes have been generous in supplying "averages," not one of them provides figures for total aid or numbers of families receiving aid. Failure to supply such data leads one to suspect that the "averages" cited were obtained by surveying officials about the amounts of loans granted and not by dividing the total amount loaned by the number of families receiving loans. The limited primary sources available are mute concerning the origins of these "averages" and the total figures from which such averages might be derived.

[20]See Table VI.1 in Chapter VI. above.

and 21,000 in Zabaikal oblast'.[21] These exiles were not imprisoned but were left to fend for themselves as best they could. By 1900-1901, prisoners and exiles comprised 5% of the Siberian population or roughly 250,000 adults. Of these 250,000, only about 30,000 were employed in agriculture as independent farmers or peasants. Of these 30,000, some 25,500 lived at a bare subsistence level even though they were considered members of "independent peasant households."[22] This leaves only 4,500 prisoners and exiles or less than 2% of the total probably outside the "agricultural proletariat" since non-subsistence level households were probably not contributors to the agricultural proletariat. At best, all the 30,000 independent peasants were completely self-employed. This would set the exile contribution to the agricultural proletariat at 220,000 to 245,500 for the years 1900-1901. This figure should be considered as an upper limit since it involves the assumption that non-independent exiles worked only in the agricultural sector.

These figures are, however, roughly consistent with some others. More carefully gathered statistics for

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[21] V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria (The Siberian Village on the Eve of October), (Novosibirsk, 1966), p. 285.

[22] L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX (The Siberian Peasantry on the Edge of Two henturies: The End of the Nineteenth-The Beginning of the Twentieth), (Novosibirsk, 1967), p. 84.

Tobolsk gubernia in 1903 revealed the presence of 46,457 prisoner families (prisoners and exiles who had acquired families in Siberia or been accompanied by their families into exile). Only 3,872 or 8% of these families were independent households; the rest supplied agricultural labor to neighboring peasants or "made ends meet" as best they could.[23]

Since many of these "independent households" probably also supplied agricultural labor to their neighbors and since exiles without families could hardly be "independent households," 92% may be taken as a lower limit to the exile participation rate in the labor market. At the turn of the century, 2 changes in the government's policy toward exiles became apparent. First, the numbers of prisoners and exiles sent to Siberia were growing smaller. Second, more of the exiles were shipped to Eastern Siberia and the Far East; fewer were allowed to settle in Western Siberia. By 1908, the total exile population of Siberia was only 74,275.[24]

The share of prisoners and exiles in the agricultural proletariat is very difficult to determine simply because the size of the Siberian agricultural proletariat is difficult to determine. My estimate of the magnitude of the Siberian

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[23] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 200; Goriushkin, Sibirskoe Krestianstvo, p.121.

[24] Tiukavkin, Sibirskaia Derevnia, p. 286.

agricultural proletariat before World War I was reported in Chapter III, Section B above as 462,300. This estimate was obtained by splitting the difference between the high and low limits of 414,000 and 510,000. Splitting the difference between the limits of the exile contribution to the agricultural proletariat given above (220,000 and 245,500), we may estimate that contribution to have been approximately 232,750 at the turn of the century. The share of exiles in the Siberian agricultural proletariat for 1900-1901 is then very roughly approximated at 50%. If one assumes that the agricultural proletariat frew in size between 1900 and 1914, this figure may be taken as a lowe limit.[25] If we assume that the total exile population of 74,275 in 1908 was part of an agricultural proletariat of constant size, then by 1908 the share of exiles dropped dramatically to 16%.[26] It probably continued to decrease until 1914. Such a steady downward path from even 1890 to 1914 would be consistent with the falling numbers of exiles and prisoners and with the growing numbers of voluntary migrants participating in the

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[25]If the proletariat grew between 1900 and 1914, it was less in 1900 than in 1914. But the size of the proletariat in 1900-1901 is the denominator of the fraction yielding the 50% figure. If it was smaller, then the fraction would be larger.

[26]This figure is roughly consistent with a statement in Tiukavkin, Sibirskaia Derevnia, p. 286 that in Irkutsk guber-nia in 1908 exiles comprised 13% of the agricultural laborers.

agricultural labor market to build up the inventory necessary for independent peasant households. After 1914, the importation of prisoners of war and the conscription of working-age men swelled the prisoner share in the agricultural labor market to between 21% and 24%.

The significance of the exiles and prisoners for the operation of the Siberian labor market should not be overlooked. These unfortunates were "locked into" the Siberian labor market. They could neither leave Siberia before their term was up nor, in most cases, lay claim to a plot of agricultural land. The right of use of such land was bestowed either by the commune or the Migration Administration; neither of these institutions was interested in protecting land tenure "rights" of exiles or prisoners. The non-agricultural sector were sometimes off-limits or offered employment only in the mines. Thus, a large share -- at the turn of the enctury, even half -- of the non-self-employed agricultural labor force could not turn to other pursuits. Such an institutional arrangement might lead to "unusual" economic behavior such as discrimination against exiles in the form of lower wages, harder work, and/or poorer conditions. A backward bending labor supply curve might even appear when wages fell as exiles scrambled to earn enough for subsistence or other members of their families had to enter the labor market. Wages in the form of protected use of a plot of land might be more desirable than cash -- especially

if some members of an exile's family would be underemployed without access to such a plot. Unfortunately, insufficiency of information makes fruitful investigation of such matters impossible. However, the peculiar position of the exiles and prisoners and their large share in the Siberian agricultural labor market cannot be forgotten when discussing the workings of that market.

B. The Trans-Siberian Railway

The importance of sheer distance as an impediment to Siberian development and the technological achievement of the Trans-Siberian Railway in overcoming this impediment have already been discussed in Chapter V, Section C, and Chapter VI, Section C, above. Mention was also made in the latter of the importance of the refrigerator car for the export of Siberian butter and meat. In this section, a brief history of the construction of various sections of the Trans-Siberian Railway will be presented followed by a discussion of government policy relating to transport costs.

The construction and operation of the Trans-Siberian Railway was a wholly government project from beginning to end. The first proposals for railroad construction in Siberia date back to 1858-1860, when Russia was in the process of annexing the Siberian Far East. Nothing was done, however, largely because the route could not be decided. The Urals mining interest promoted a northern route across

Siberia, while officials concerned with trade, possible migration and settlement, and strategic advantage promoted the southern route. The strategic advantage was in developing the strip of land along the Chinese border, thus discouraging encroachment. Alexander II finally approved the soutern route in 1875, but construction was delayed until more pressing political matters such as the Russo-Turkish War of 1877-1878 were disposed of. Management of the construction and operation of the railway was finally entrusted to the Committee on the Siberian Railway, which eventually "stuck its nose" into all affairs even remotely connected with the railroad including the welfare of new peasant migrants to Siberia.[27] Construction was finally begun in 1891. In October 1896, two important rail lines were opened to traffic almost simultaneously. The Ekaterinburg-Cheliabinsk branch connected the Siberian Railway with the Perm-Tiumen line. The first great stretch of the Siberian Railway proper was 1,329 versts (877 miles) long and connected Cheliabinsk to the Ob bridge near Krivoshchekovo. The mid-Siberian line, 1,715 versts (1,132 miles) from the Ob River to Innokentievskaia (near Irkutsk), was opened in 1898 as was a branch line to Tomsk. The Irkutsk-Baikal line (around the tip of Lake Baikal) was completed in 1899. The Trans-Baikal, opened in 1900, ran 1,035 versts (683

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[27]Treadgold, p. 107-108.

miles) from Mysovaia on the eastern shore of Lake Baikal to Dretensk at the terminus of the Shilka-Amur Railway. The Ussuri line from Vladivostok was begun in 1897 and a branch line from Harbin to Dairen called the South Manchurian Railway was begun in 1898.[28] These Chinese rail lines were of great significance since they allowed the Siberian Far East to import grain from Manchuria more cheaply than from Western Siberia.

The immediate economic effect of the railroad was to reduce transport costs between urban centers on the railroad and the cities of European Russia by 80% or more.[29] Because of the great distances in Siberia, these transport costs were still substantial, however. In addition, transport costs in Siberia to the nearest rail depot were very high. This was due partly to the fact that there were few navigable rivers and roads to connect the hinterland to the railroad and partly to the fact that, since the railroad was the only link with the outside world for many areas, the dependence on the railroad stretched farther from it in Siberia than in European Russia. In European Russia, the belt of economic

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[28]Treadgold, p. 108, 111.

[29]L.M. Goriushkin, Sotsial'no-Ekonomicheskie Predposylki Sotsialisticheskoi Revoliutsii v Sibirskoi Derevie (The Socio-Economic Preconditions of the Socialist Revolution in the Siberian Village), (Novosibirsk, 1962), p. 56.

influence of the railraod usually stretched for about 50 versts (33.14 miles) on either side of the track; in Siberia it stretched for 100 to 200 versts (66.9 to 132.58 miles) on either side of the track.[30] The railroad also drew products from a distance up to 700 to 800 versts (464.03 to 530.32 miles) where water transport to the rail depot was possible.[31]

Government policies towards Siberian export of various agricultural products differed significantly. Butter had two important advantages in regard to transport costs: (1) it had a relatively high value per unit weight (compared to grain) and could, thus, absorb transport costs more easily; (2) the government wholeheartedly supported the export of Siberian butter. As a result, the railroad "bent over backwards" in its efforts to aid Siberian butter exports. The Trans-Siberian Railway had the finest refrigerator cars in Europe (first introduced in 1899) and made up special butter trains with regular ice stops on the routes from Siberian stations to the Baltic ports. Despite these efforts, the availability of refrigerator cars was the effective constraint on Siberian butter export.[32] The freight charge for transporting one pood of butter[33] from Novonikolaevsk to

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[30] Osobennosti Agrarnogo Stroia Rossii v Period Imperializma (Peculiarities of the Agrarian Structure of Russia in the Period of Imperialism), (Moscow, 1962), p. 16.

[31] Osobennosti Agrarnogo Stroia v Period Imperializma, p. 186.

[32] Tiukavkin, Sibirskaia Derevnia, p. 353.

Riga (a Baltic port) was slightly more than a ruble. But an equivalent value of wheat (weighing 15 poods or more) cost about 8 rubles to ship. The rail tariff for freight of one pood of butter to the city of Revel in 1901 was 89.29 kopeks from Kurgan, 95.80 from Omsk, 99.39 kopeks from Kansk, and 102.96 kopeks from Novonikolaevsk (on the Ob River). The government sales was only 1/24 kopek per pood and export butter was given a 10% discount on this. Up to 1902, weekly butter tains apssed through the center of European Russia to the Baltic ports; after 1902, there were daily trains.[34]

Siberian meat also enjoyed the advantages of relatively high value per unit weight (when compared to grain) and government support of its export from Siberia. These factors lowered transport costs and promoted export. Unfortunately, meat lost out to butter in the allocation of the limited numbers of refrigerator cars on the railroad. A look at transport costs alone suggests that only dressed meat should have been shipped. The cost of transporting a pood (36.113 pounds) of meat "on the hoof" from Novoikoleavsk to Moscow was 2.32 rubles not counting weight loss from the journey.[35]

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[33] 1 pood = 36.113 pounds. These figures are not converted to charges per pound since only their relation to value per unit weight is of importance.

[34] Goriushkin, Sibirskoe Krest'ianstvo, p. 163.

[35] Goriushkin, Sibirskoe Krest'ianstvo, p. 169.

A pood of dressed meat was three times more valuable than a pood of live steer.[36] So why bother to ship live steers at all? The answer can be had in a single word -- refrigeration. Frozen meat could be shipped by rail without refrigeration facilities only in winter.[37] And export of livestock products from Siberia was definitely hampered by a shortage of refrigerator cars and facilities.[38] Thus, meat for export from Siberia in excess of the refirgeration and handling capacity of the railroad had to either wait till winter for shipment or be transported by rail "on the hoof" and at greater expense.

Siberian grain had neither of the advantages in transportation and export which Siberian butter and meat had. It was a commodity with low value per unit weight; thus, transport costs made up a large share of its delivered price in European Russian markets. A significant share of the transport costs for Siberian grain were incurred even before it reached the railroad. In general, it was not profitable to move grain more than 100 to 150 versts (66.29 to 99.43 miles) by cart to the railroad depot. The American farmer on the

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[36] Tiukavkin, Sibirskaia Drevnia, p. 363.

[37] Goriushkin, Sotsial'no-Ekonomicheskie Predposylki, p. 66.

[38] Istoriia Sibiri s Drevneishikh Vremen do Nashi Dnei, Vol. III, p. 318.

eve of World War I paid the equivalent of 4 to 8 kopeks to move a pood of grain to the nearest shipping point; the peasant of Tomsk gubernia paid on average 12.6 kopeks per pood for the same service.[39] The peasant of Tobolsk gubernia paid on the average 11 kopeks to move a pood of his grain to the railroad depot; in Akmolinsk oblast' the average cost was 10.6 kopeks. But these averages hide the high variability of grain transport costs within these large administrative units. For example, in Tobolsk uezd the average distance to market was 98 versts (64.96 miles) at a cost of 25.3 kopeks per pood. In Zmeinogorsk uezd, the distance to market was 135 versts (89.49 miles) at 20.3 kopeks per pood.[40]

Once the Siberian grain reached the railroad depot, it had to bear the high rail freight charges. These charges were considerable for three reasons: 1) rail freight charges in Russia in general were high, especially when compared to those in the United States; 2) Siberian grain had to travel the longest distance of any Russian grain shopped into European Russia; 3) the Cheliabinsk barrier was specifically designed to discriminate against Siberian grain exports. As evidence of the first point, the average cost in the United States of shipping one pood of grain 1,150 kilometers by

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[39]Goriushkin, Sotsial'no-Eknomicheskie Predposylki, p. 59-60.

[40]Goriushkin, Sibirskoe Krest'ianstvo, p. 151-152.

rail was the equivalent of 13.3 kopeks; in Tsarist Russia, that cost was 22.62 kopeks or 70% more.[41]

The second point can easily be established with a glance at a map of Russia. The third point, the Chelia-binsk freight rate barrier to grain export from Siberia, requires more discussion.

The landowners of European Russia feared that the Trans-Siberian Railway would leave their markets vulnerable to cheaper Siberian grain. According to the railroad rates set in 1889 (before the Trans-Siberian Railway was even under construction), total shipping charges increased with distance up to 3,000 versts (1,989 miles); the railroad did not charge extra for freight shipped beyond this distance. In 1893, a new rate system was introduced which instituted rail charges for all commodities for distances beyond 3.000 versts. This new rate system was clearly instituted to cover freight shipments in and out of Siberia.[42] It was the response of the rate-setting authorities to the new long-distance shipping which would begin with the completion of the Trans-Siberian Railway. The large landowners of European Russia, however, were dissatisfied with the new rates -- they were not high enough to protect their markets from Siberian grain. By the time of the opening of the Trans-Siberian line in 1896,

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[41]Goriushkin, Sotsial'no-Ekonomicheskie Predposylki, p. 60.

[42]Tiukavkin, Sibirskaia Derevnia, p. 340.

these landowners had managed to pressure the railroad authorities into raising the rates on Siberian export grain by instituting breaks in the rate schedule on grain only. The breaks were at two points -- Cheliabinsk in the west and Irkutsk in the east. When Siberian grain passed through either one of these cities, the calculation of freight charges was begun anew just as if the shipment had been unloaded and reloaded in Cheliabinsk or Irkutsk. The break at Irkutsk proved ineffective since little grain was shipped west from Eastern Siberia and was dropped in 1900. The Cheliabinsk break, however, proved quite effective and raised grain transport costs per pood (1 pood = 36.113 pounds) by 8 to 10 kopeks above the rates which would have been effective without the break.[43]

It might, of course, be argued that the breaks were not designed specifically to retard Siberian grain exports to European Russia, but only reflected the true cost of operating the Siberian line spread over the users of the line. The Trans-Siberian Railway was not used as heavily as were the railroads in European Russia. In 1908, the Trans-Siberian carried only 867 passengers for every verst (0.6629 miles) of track; the equivalent figure in European Russia was 3,155. Freight weight in 1908 totalled 205 million

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[43]Tiukavkin, Sibirskaia Derevnia, p. 340.

poods (1 pood = 36.113 pounds) or 31,928 poods per verst of track. The railroads in European Russia carried 5,285 million poods of freight in that year or 109,700 poods per verst of track.[44]

These figures are biased against the Trans-Siberian Railway, however, since the Trans-Siberian carried less freight but undoubtedly carried it farther than the railroads of European Russia. Unfortunately, pood-verst and passenger-verst figures are not available for the Trans Siberian Railway. It might also be argued that traffic on the Trans-Siberian Railway was appreciatby lowered by the Cheliabinsk break in the rate structure; in that case, traffic was low because of the high rates -- not the other way around.

In even seriously considering that the Cheliabinsk break in the rate structure might not have been instituted as a weapon against Siberian grain exports to European Russia I have set up a "straw man" to knock down. Not one of the sources I have consulted have taken this stand. The history and nature of the Cheliabinsk barrier itself makes its purpose obvious. As noted above, the rate-setting authorities made their objective judgement public in the new long-haul rates introduced in 1893, two years after the construction of the Trans-Siberian began and three years before it was

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[44] Osobennosti Agrarnogo Stroia Rossii v Period Imperializma, p. 16.

opened to traffic. A number of sources refer to pressure put on the Tariff Committee by the landowners of European Russia to increase transport costs somehow in order to protect European Russian markets from Siberian grain.[45]

Zaitsev, a Soviet scholar writing in 1925, even reports that the Cheliabinsk break was retained in 1900 (when the break at Irkutsk was dropped) because the landowners of central Russia "insisted in conference in 1900 on the maintenance of the calculation of rail transport charges on Siberian grain separately for the stretch of the Siberian line up to Cheliabinsk and for stretches of lines in European Russia except the Perm road."[46] The fact that the government was interested in promoting the export of Siberian grain (while trying to appease the landowners of central Russia) is established by the efforts to find alternative outlets for Siberian grain. This is the reason why the Perm railroad was exempt from the Cheliabinsk rate break. Siberian grain going to Perm could have only one destination -- the export ports of Archangel (on the White Sea) and Kotlas (on the Dvina River).

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[45]Skliarov, p. 493; Tiukavkin, Sibirskaia Derevnia,p. 340; A.F. Zaitsev, Ocherki po Istorii Zheleznodorozhnykh Tarifov SSSR: Chast' I, Khlebnye Tarify (notes on the History of Railroad Tariffs of the USSR: Part I, Grain Tariffs), (Moscow, 1925), ;. 170-171.

[46]Zaitsev, p. 170.

The grain would not pass through the center of European Russia, and, thus, could not be marketed in the big cities of European Russa or lower grain prices in Russia's Baltic ports except by affecting the world market price. This experiment was doomed to failure, though, since the White Sea ports were becoming ice-locked just as Siberia was harvesting its grain. The grain would have to be stored until the following spring. It was still much more profitable to transport Siberian grain to London via Petersburg rather than Archangel. Exporters of Siberian grain did take advantage of the goveernment's good intentions, however. Siberian grain took the Perm line and either went roundabout to European Russian markets or was transferred to barges at Ribinsk and floated to Petersburg. The government then had to rejigger the local rates to make it more profitable to keep the grain on the desired route to Archangel and Kotlas.[47]

Siberian grain exporters also attempted to circumvent the Cheliabinsk tariff break in other ways. One method was to process the grain before shipment. This is one reason for the rapid development of the flour-milling industry in Siberia. The break in the rate structure did not apply to flour -- only to raw grain. But in 1907, the government instituted a special order pertaining to flour exported from

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[47]Zaitsev, p. 171.

Siberia to European Russia. This order made flour subject to the Cheliabinsk rate break.[48] This stopped the development of the flour-milling industry cold and from then on most Siberian flour was marketed in Eastern Siberia. The effect of the Cheliabinsk rate break on grain transport costs is summarized in the following table.

[48]Skliarov, p. 494.

Table VII.2: Cost of Transporting Grain by Rail in Kopeks[49] Per Pood (1 pood = 36.113 pounds) Before 1913

Origin and Destination	Freight Charge Without Rate Break	Actual Charge With Break at Cheliabinsk	Difference
Kurgan-Kiev	34.71	39.31	4.60
Omsk-Kiev	41.01	48.32	7.31
Omsk-Revel	42.60	49.43	6.83
Omsk-Riga	44.51	50.90	6.39
Novonikolaevsk-Elets	40.29	49.17	8.88
Novonikolaevsk-Moscow	40.86	49.57	8.71
Kurgan-Moscow	30.31		
Omsk-Moscow	32.01		
Kurgan-Petersburg		37.3	
Omsk-Petersburg		46.3	
Novonikolaevsk-Petersburg		52.8	
Krasnoyarsk-Petersburg		58.9	
Kansk-Petersburg		60.9	

The Cheliabinsk rate break brought the Treasury an extra 8.3 kopeks for every pood (36.113 pounds) of grain exported from Siberia.[50] Geshele, a Soviet scholar, reports that the average cost of delivery of one ton of Siberian grain by rail

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[49]Goriushkin, Sibirskoe Krest'ianstvo, p. 275; Zaitsev, p. 227; S.V. Vostrotin, Severni Morskoi Put'i Cheliabinskii Tarifnyi Perelom v Sviaizi s Kolonizatsiei Sibiri (The Northern Sea Route and the Cheliabinsk Tariff Barrier in Connection with the Colonization of Siberia), (Petersburg, 1908), p. 30-31.

[50]Goriushkin, Sibirskoe Krest'ianstvo, p. 276.

in European Russia was increased from 4.88 rubles to 6.10 rubles or by exactly 25%.[51]

These figures seem to be a bit inflated as do those of Skliarov who claims that the general cost of rail-transport of Siberian grain composed between 50% and 75% of its sale price in its European Russian ports of departure.[52] Nevertheless, rail transport costs were evidently an extremely important factor in determining the ability of Siberian peasants to export their grain and the effect of the Cheliabinsk rate break was certainly not of negligible importance.

As noted above, Berezin claims that some 31% of the commercial grain produced in Western Siberia in 1913 was shipped to foreign countries. At that time the cost of transportating a pood of grain from the Altai to London by way of either Riga or Petersburg was 71 kopeks. The cost to Petersburg alone was 59 kopeks (46.3 kopeks for rail transport and about 13.7 kopeks to reach the railroad depot) or 83% of the total cost. The cost of going through Archangel was 59.7 kopeks of which 51 kopeks or

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[51]E.E. Geshele, Ocherki Razvitiia Sibirskogo Zemledeliia (Essays on the Development of Siberian Agriculture), (Omsk, 1957), p. 55.

[52]Skliarov, p. 493.

85% of the total transport costs were just to reach Archangel.[53]

The figures for Archangel assume that the grain could reach the port before it became ice-locked for the winter. The average price for a pood of wheat on the London market in 1909-1913 was between 1.05 rubles and 1.15 rubles, so if the peasants of Siberia were to participate in this market regularly, they would have to sell their wheat at 34 to 44 kopeks per pood or 55 to 56 kopeks per pood if it could beat the ice to Archangel.[54] A glance back at the average prices for spring wheat in Siberia in Table 12 in the Appendix to Chapter III should now serve to indicate just how tenuous Siberia's link to the world grain market was.[55] If we add the 56 kopeks per pood maximum price to the 14 kopeks per pood average transport cost to the rail depot in Siberia, we come up with a maximum price at the rail depot in Siberia of 70 kopeks per pood if the grain is to be competitive on the London market. Yet in Table 12 in the Appendix to Chapter III, only four of the 22

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[53]Goriushkin, Sibirskoe Krest'ianstvo, p. 150. These figures are somewhat odd in that the charge for grain going by sea from Riga or Petersburg to Londonwas 38% more than the charge for sea freight from Archangel to London even though the Archangel-London run involved significantly greater distance. I have not been able to explain this.

[54]Goriushkin, Sibirskoe Krest'ianstvo, p. 150.

[55]The prices quoted in Table 12 in the Appendix to Chapter III include the cost of transport to the rail depot which was said above to average 12 to 14 kopeks per pood.

reported five-year average prices for spring wheat in each of the four Siberian gubernias are below the watershed price of 70 kopeks per pood.

In a well-functioning world grain market, one would expect the Siberian price to equal the London price minus transport costs. The fact that on the average the Siberian price exceeded this figure indicates the tenuousness of Siberia's position as an exporter to the world (specifically, London) market. It also indicates the importance of transport costs and, therefore, the importance of the Cheliabinsk barrier to grain export for Siberian participation in the world grain market. Only when circumstance temporarily pushed down wheat prices in Siberia below average or pushed them above average on the London market or both could Siberian grain be profitably exported from Siberia to London.

The Cheliabinsk tariff barrier (where "tariff" refers to rail transport charges) was finally dismantled just before World War I. The lowering of the barrier was accomplished in three stages. From August 1, 1911, 40% of the effective rate increase due to the barrier was removed. From August 1, 1912, 70% of the extra transport costs imposed by the barrier was removed, and on August 1, 1913, the barrier was removed entirely. These three steps removed the extra cost in the transport of Siberian grain in either seed or flour form.[56]

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[56]Zaitsev, p. 228.

Why was the Cheliabinsk break in freight rates finally removed? Zaitsev notes two factors. First, the attempted revolution of 1905-1906 induced the government to attempt to use Siberia as a safety valve for the excess and restless rural population of European Russia. It soon became obvious that these people could not be induced to move and remain content if their produce was cut off from its markets in European Russia by an artificial grain freight rate barrier.[57] The second factor involved Siberia's serach for alternative outlets to the world. In 1905, the Ministry of Routes of Communication sponsored an expedition which confirmed the possibility of a northern sea route into the mouths of the Ob and Yenisey Rivers. Talk in the popular press and the State Duma immediately turned to the possibility of Siberian grain being shipped northward on these rivers and then being loaded onto ocean-going vessels to be taken directly to world markets such as London. Little mention was made of the fact that ports at the mouths of these rivers would be ice-locked five months out of the year just like Archangel. Further speculation concluded that such shipping would be economical only if the ships carried freight both ways, that is, they would bring in manufactured goods from foreign suppliers.[58] Thus, the Imperial government found itself

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[57]Zaitsev, p. 224.

[58]Zaitsev, p. 225.

threatened with the possibility that Siberia would become economically independent of European Russia and form trading links directly with foreign countries. Tiukavkin also mentions that poor harvests in European Russia led to public pressure to lower the Cheliabinsk tariff barrier.[59] Whether or not the reader considers these factors to be of objective importance, they were apparently given considerable weight in the final decision to remove the grain export barrier at Cheliabinsk.

The Soviet scholar Tiukavkin claims that Siberia's considerable butter, meat, and other animal product exports, as well as the heavy favoring of wheat as opposed to other crops, were due to the Cheliabinsk rate break.[60] The Cheliabinsk barrier made general grain culture and export less profitable for many peasants who, supposedly, then switched to wheat, butter, or meat production. However, grain production in general did not contract with the opeining of the railroad or the institution of the Cheliabinsk rate break--it expanded. In fact, all agricultural activity expanded. Logically, Tiukavkin's claim is equivalent to the claim that without the Cheliabinsk rate

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[59]Tiukavkin, Sibirskaia Derevnia, p. 342.

[60]Tiukavkin, Sibirskaia Derevnia, p. 342.

break Siberian agricultural expansion would have been confined to a balanced growth of general grain production. This is patently untrue. If wheat specialization was the most profitable grain producing activity since it had lower transport costs per unit value with the rate break, it would still have lower transport costs per unit value than other grains without the rate break. So, profit-maximizing peasants would still gravitate toward wheat specialization. And both meat and butter had lower transport costs per unit value than those for grain with or without the rate break. Whatever small effect the Cheliabinsk rate break had on the expansion of butter and meat production at the expense of general grain culture was dwarfed by the general expansionary effect of the railroad which opened markets in European Russia and abroad to all Siberian agricultural products in general.

Two general conclusions may be drawn from this discussion of the Trans-Siberian Railway. First, the effective constraint on the ability of Siberia to export its agricultural products was neither a matter of finding markets nor of promoting inexpensive production; rather, the foremost problem was one of transport capacity and costs. This simple fact made Siberian exports highly vulnerable to government control. Second, the policies of the Tsarist government were not all coordinated towards a single goal.

Rather, its policies were made "schizophrenic" by its responses to pressure groups. The facts that the railroad was built along the southern route, that peasant migration was encouraged, and that agriculture including the cultivation of field crops was aided[61] all indicate a policy goal of agricultural development for the region. The Cheliabinsk rate barrier was a measure forced on the government by the large landowners of European Russia in direct contradiction to this goal.

C. The Tax Burden on the Siberian Peasantry

The tax burden on the Siberian peasantry stemmed from both direct and indirect taxes. The direct taxes will be discussed in detail below. Unfortunately, I have not been able to obtain any information about the burden of indirect taxes on the Siberian peasantry. Such taxes were no doubt a substantial burden on the Russian peasantry in general, but there is no way of determining the burden on the Siberians with the limited data available. There were excise taxes on beer, tobacco, mead, yeast, cigarette tubes, petroleum products, matches, and other goods as well as import duties on consumer products such as tea and capital goods such as agricultural machinery. In addition, considerable revenue was obtained from the state monopoly on hard liquor. But I have found no

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[61] See Chapter VIII below.

information with which to estimate the burden on the Siberian peasantry of the taxes on these goods.

Before reporting the figures on the direct taxes levied on the Siberian peasantry, a few general points should be made and some definitions given.

(1) The Siberian peasant faced taxes from every level of government. The simplest tax was the "soul" tax. This was a head tax levied on every male peasant whose name appeared in the last census regardless of age. The tax had to be paid even if the male peasant had died since the last census since his name remained on the tax rolls till the following census. Likewise, a male child had no tax levied on him until he was found out in the next census. An individual on the tax rolls in the last census revision in 1858 was thus dubbed a "revised soul." In 1882, the soul tax in European Russia was replaced by a land-obrok or state-obrok tax. Obrok had originally been a form of quitrent or or rent paid by a peasant in lieu of services, but had apparently lost its original meaning before 1900. The government regarded this tax as a land rent since final ownership of all land in the Empire rested in the Tsar as head of state. The peasants considered the land as their own property and the obrok tax as just another tax. The soul tax was not replaced by the state-obrok tax in Siberia until 1898 on state lands (all but Kabinet lands) and in

1899 on Kabinet lands (land belonging to the Tsar's household). However, due to insufficient data on size of landholdings in Siberia, this before degenerated into a mere change from "revised soul" to "holding soul," that is, a male peasant working the land. The soul and state-obrok payments each usually amounted to almost half the total tax burden on the Siberian peasants including the value of labor obligations and went to the treasury of the central government.[62] The remainder of the burden was composed of gubernia zemstvo, volost, and mir taxes. These were roughly similar to state, county, and village taxes respectively. They were used to support the bureaucracies and provide for local government services at lower levels of government. The gubernia zemstvo taxes were misnamed. The zemstvo in European Russia was an elective district council which took care of local needs. There were no zemstvos in Siberia, where the gubernia-level government performed the functions that the European Russia zemstvos performed. So the taxes paid to the gubernia level of government in Siberia were called "zemstvo collections." These "zemstvo collections" were levied annually and re-estimated every three years. They were used to maintain the gubernia government bureaucracy and institutions

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[62] Istoriia Sibiri s Drevneishikh Vremen do Nashikh Dnei, Vol. III, p. 40.

concerned with peasant affairs. Up to 1888, these taxes were collected by the "soul tax" method. After 1888, however, they were levied on the lands and forests used by the peasants as well as on factory, plant, and trade enterprises. The volost' and mir taxes (roughly equivalent to county and village taxes) continued to be "revised soul" taxes.[63]

(2) Besides money taxes, the Siberian peasants also had substantial "natural" obligations in the form of the provision of goods and services. The obligations included the construction and repair of bridges and roads, the provision of food and lodging for travelling officials and special visitors, the provision of transportation and driver services for officials and the military and their baggage, providing for the needs of village elders, the protection of common forests and other lands, night guarding of the settlement, and maintenance of common buildings.[64] The burden of these obligations was distributed among the households in each village in proportion to the number of working males.[65] The distribution of the burden among the villages across Siberia was far from equal, however, since it depended

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[63] Istoriia Sibiri s Drevneishikh Vremen do Nashikh Dnei, Vol. III, p. 40.

[64] Kuznetsov, Sbornik Statisticheskikh Svedenii ob Ekonomicheskom Polozhenii Pereselentsev v Sibiri, Part I, p. 126-133; Istoriia Sibiri s Drevneishikh Vremen do Nashikh Dnei, Vol. III, p. 40.

[65] Skliarov, p. 425.

completely on the needs imposed by local conditions. Thus, a village which was near an important road or bridge had a much larger burden of work obligations than one which was not. The Soviet scholar Goriushkin reported that the money equivalent of the average natural obligation per peasant household in Tobolsk gubernia before the War was roughly four rubles. Yet a village in Tobolsk gubernia with a heavy road repair burden had natural obligations valued at 13.66 rubles per working male.[66] Apparently no efforts were made to compensate such villages by lowering their money taxes. These "natural" obligations averaged nearly 20% of the total tax burden on the peasantry of Tobolsk gubernia and 25% of the total tax burden on the peasants of Tomsk gubernia.[67] Natural obligations were extremely inconvenient for the peasants, and their efforts to have them converted to money taxes met with gradual success.[68]

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[66] L.M. Goriushkin, "O Kharaktere Povinnostei Krestian Zapadnoi Sibiri v Kontse XIX-Nachale XX vv." Izvestiia Sibirskogo Otdeleniia Akademii Nauk SSSSR-Seriia Obshestvennikh Nauk ("About the Character of the Obligations of the Peasants of Western Siberia at the End of the 19th-Beginning of the 20th Centuries," News of the Siberian Division of the Academy of Sciences of the USSR-Series on the Social Sciences), #5, Issue 2, 1963, p. 104.

[67] Osobennosti Agrarnogo Stroia Rossii v Period Imperializma, p. 148.

[68] Istoriia Sibiri s Drevneishikh Vremen do Nashikh Dnei, Vol. III, p. 40; Tiukavkin, Sibirskaia Derevnia, p. 215.

(3) Changes in the tax structure and the official allocation formulae were of little economic significance. This is surprising to an economist since he would normally attach great significance to such changes as the switch from the lump-sum soul tax to the state-obrok tax on land. Two factors prevented such changes in the tax structure from having any real effect: the mir and lack of household income information. Up to 1906, the tax collectors had always stopped at the mir level; that is, taxes were levied as a lump sum on the peasant mir according to whatever formula was used and the mir then allocated the tax burden to individual members as it saw fit. This is one reason why the soul tax based on male peasants who had been living in 1858 was not as inequitable as it seems. Males born after 1858 did not escape taxation nor were families which had lost males since 1858 necessarily taxed. Rather, the burden on the mir was proportional to the number of male members it had in 1858. This system did not lead to unreasonable inequalities among mirs in Siberia until the great migration after 1896 led to the founding of new mirs and great expansion of some old ones. The conclusion of all this discussion is that while the government attached great significance to the replacement of the soul tax with the land-obrok tax in Siberia in 1898-1899, the peasant whose individual tax burden was set by the mir

saw no change at all (unless the amount of the total tax on the mir had been changed with the change of formula). The mirs in Siberia apportioned the tax burden among their peasant members according to any of a number of formulae including number of males, number of full-time workers, number of persons of either sex, ages of various members of households, possessions such as livestock, area sown to crops, number of non-agricultural workers, amount of non-agricultural wages, number of workers capable of harvesting crops, shares of forest land, and number of chimneys.[69]

The reforms of 1898-1899 had been intended to equalize the tax burden as a share of household income among peasant households and to bring Siberian taxes into line with those in European Russia.[70] To this end, the law of 1898-1899 had given local authorities the power to raise or lower obrok tax quotas at the gubernia and volost' levels by up to 25% and to similarly adjust village obrok quotas by as much as 50%.[71] The official was still prevented, however, from reaching down within the village to determine the tax structure

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[69]Goruishkin, Sibirskoe Krest'ianstvo, p. 246; Istoriia Sibiri s Drevneishikh Vremen do Nashikh Dnei, Vol. III, p.41; Goriushkin, Sotsialno-Ekonomicheskie Predposylki, p. 19.

[70]Tiukavkin, Sibirskaia Derevnia, p. 207.

[71]Goriushkin, Sibirskoe Krest'ianstvo, p. 248.

faced by the individual peasant household--the economic unit which made factor allocation decisions.

After 1906 the second factor mentioned above, lack of information on household incomes, became the factor which prevented the government from affecting peasant allocation of productive factors through the tax formula. In that year it became legal for a peasant household to exist outside the mir, so taxes had to be collected directly from the peasant household and not through the mir.[72] But because of lack of data, officials hardly considered household income as a means of allocating the tax burden. They usually turned to the same formulae which the mir used such as number of workers, number of males, total number of people, area sown to field crops and hayfields, and so forth. Money income was considered only rarely.[73]

Thus, over the entire period from 1890 to 1917 and throughout Siberia, the tax structure faced by the individual peasant household was either determined by the mir or by local officials who had to follow mir practices in general due to lack of information. The central authorities could try to squeeze a little more out of the peasants, but they could not use the tax structure itself to affect factor

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[72]Skliarov, p. 427.

[73]Tiukavkin, Sibirskaia Derevnia, p. 208.

allocation decisions at the micro-economic peasant household level.

(4) There were an unspecified number of peasants who disappeared into the vastness of Siberia and paid no taxes at all. There is naturally no measure of their numbers. Of interest, however, is a quotation from a report of State-Secretary Kolumzin at the turn of the century concerning several villages in Yeniseysk gubernia which paid no taxes: "It is apparent that at the present time.... one of the most fertile parts of Minusinsk okrug (the district around the town of Minusinsk) belonging to the Treasury is being exploited. Over the past 25 years, the population settled here has not paid any kind of taxes or supplied required labor services. This is demoralizing especially for children who grow up in such an atmosphere."[74]

Appendix Tables 1 and 2 report the gross value of the obrok and zemstvo-type taxes levied on the peasantry of Siberia. Also included are the total arrears in these collections expressed as a percentage of the current year's levy. There is, of course, no way of knowing to what extent these arrears might have been diminished had

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[74]Quoted in M.S. Alferov, Krest'ianstvo Sibiri v 1917 Godu (The Peasantry of Siberia in 1917), (Novosibirsk, 1958), p. 5.

all the peasants in Siberia been subject to taxation since the arrears or "insufficiencies" include not only payments for which specific peasants were liable but also shortages due to incorrect estimates of the revenues to be had from the region.

(5) There can be little doubt that the tax burden on the Siberian peasantry was much lighter than that on the peasants of European Russia. In 1897, the soul tax on the Siberian peasantry brought in 3,200,000 rubles or 2% of all the direct taxes in the Empire. But in that year Siberia's share of the rural population of the Empire was 5%.[75] Siberia paid proportionally less in taxes by any measure--per household, per head, per acre sown, or per unit of income. The Tsarist investigator Khramkov concluded that the total of taxes per household in Tomsk gubernia came to twenty rubles including natural obligations. The Soviet scholar Goriushkin set the amount of all taxes in Tobolsk gubernia in 1903 at 19.6 rubles per household.[76] Another Soviet scholar, Tiukavkin, reports the following.

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[75]Tiukavkin, Sibirskaia Derevnia, p. 203.

[76]Tiukavkin, Sibirskaia Derevnia, p. 217.

Table VII.3: Per Household Tax Burden by Class in 1911-1912[77]

Class	Tomsk Gubernia	Voronezh Gubernia
Poor	16.2	15-17
Middle	20.7	32-49
Kulak	31.5	68-86
Average	-	34.3

The tax burden on the Siberian peasantry proportional to area sown was also relatively low. In 1911-1912, the average tax per sown acre in Tomsk gubernia was 0.18 rubles; in Tobolsk gubernia, 0.20 rubles; but in the Caucausus, the tax burden reached 1.29 rubles per sown acre.[78] The following table suggests that the tax burden on the Siberian peasantry estimated as a share of income was also lighter than that in European Russia.

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[77]Tiukavkin, Sibirskaia Derevnia, p. 217. Voronezh gubernia in European Russia was one of the chief suppliers of peasant migrants to Siberia. The definition of "class" was not given.

[78]Tiukavkin, Sibirskaia Derevnia, p. 218.

Table VII.4: Taxes on Siberian Peasantry Estimated as Percentage of Peasant Income in 1911-1912[79]

Gubernia or Region	Tax Obligations Considered	Taxes as Percentage of Income
Tobolsk	All	24.3%
Tomsk State Lands	All	16.9%
Tomsk Kabinet Lands*	All	22.8%
Yeniseysk	All	22%
Irkutsk	All	26%
Four Siberian Gubernias	All	22.4%
European Russia	Money Taxes Only	24%
Four Siberian Gubernias	Money Taxes Only	16.7%

*Kabinet lands belonged directly to the Tsar's household.

The figures for taxes as percentage of total income in Table VII.4 seem too high. The Soviet scholar Goriushkin reports that for a peasant family of Tomsk gubernia sowing between 0 and 8.1 acres in 1911-1912, taxes amounted to 11.1% of annual income.[80] Another Soviet scholar, Tiukavkin, in the same book in which he provides the figures in Table VII.4 above, reports the following.

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[79]Tiukavkin, Sibirskaia Derevnia, p. 218.

[80]Goriushkin, Sibirskoe Krest'ianstvo, p. 254.

Table VII.5: Average Income and Tax Data in Rubles of[81] Old-Settler Households Grouped by Area Sown in Tomsk Gubernia in 1911-1912

Area Sown	Total Income	Taxes and Obligations	Taxes and Obligations as Percentage of Total Income
0 to 10.8 acres	666.6	16.2	2.4%
10.8 to 27 acres	1,047.0	20.7	2.0%
Over 27 acres	2,500.8	31.5	1.2%

The figures in Table VII.5 are certainly no more reliable than those in Table VII.4. They are provided here so that the reader will not be misled about the reliability of figures which are related to peasant income in any way. At any rate, it is hoped that all the figures in Table VII.4 are biased in the same direction to roughly the same degree; otherwise, the figures tell us nothing.

Now that we have covered the most important general facts about the direct tax burden on the Siberian peasantry, we can look at the amounts and general distribution of that burden. Appendix Tables 1, 2, and 3 present data on the gross collections of various direct taxes for the four Siberian gubernias. The following table gives the shares of total direct taxes in Siberia collected by the various levels of government.

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[81] Tiukavkin, Sibirskaia Derevnia, p. 225.

Table VII.6: Percentages of Total Direct Taxes in Siberia[82] Collected by Various Levels of Government in 1910-1912

Gubernia	State-Obrok Taxes	Zemstvo-Type Gubernia and Volost' Taxes	Mir Money Taxes	Value of Natural Obligations
Tobolsk	40.3%	19.3%	20.4%	20.0%
Tomsk (State Lands)	28.0%	10.9%	26.7%	34.4%
Tomsk (Kabinet Lands)	30.0%	11.3%	32.4%	26.3%
Yeniseysk	23.4%	28.7%	25.4%	22.5%
Irkutsk	14.6%	24.0%	31.2%	30.2%
Total	29.6%	17.0%	27.7%	25.7%

These figures reveal that there was a high variation in the share of total taxes collected by each government level among the gubernias of Siberia. Specifically, the central government got over 40% of the tax ruble in Tobolsk gubernia, but less than 15% of the Irkutsk gubernia tax ruble. This immediately raises the question of the relative tax burden as distributed among the regions of Siberia.

[82] Derived from Appendix Table 3.

Table VII.7: Relative Regional Tax Burden Within Siberia in 1910-1912[83]

Gubernia	Percentage of Rural Population of Siberia	Percentage of Total Siberian Direct Taxes
Tobolsk	28%	26%
Tomsk	51%	50%
Yeniseysk	12%	11%
Irkutsk	9%	13%

Table VII.7 indicates that the percentage of total tax burden exceeded the percentage of rural population only for Irkutsk gubernia, which according to Table VII.6 paid the smallest share of its total taxes to the central government. So, although Irkutsk gubernia bore a heavy tax burden in proportion to its population, a large proportion of this burden was collected by local levels of government rather than being siphoned off to the national treasury.

The information on changes in the tax burden on the Siberian peasantry over time is incomplete due to the 1898-1899 changes in the tax structure, almost complete lack of data on mir taxes, and gaps even in the records of tax receipts from Siberia for the national and gubernia levels of government. Nevertheless, the following rable indicates the high variability of tax receipts from year to year, the

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[83]Tiukavkin, Sibirskaia Derevnia, p. 213.

growth in the collection of zemstvo-type taxes on the gubernia and volost levels, and the stagnation of state-obrok taxes due to the exemption of new migrants from these taxes.

Table VII.8 Index Numbers (1900 = 100) of Tax Receipts[84] From the Four Siberian Gubernias

Year	State-Obrok Taxes	Zemstvo-Type Gubernia and Volost' Taxes
1899	56	-
1900	100	100
1901	67	151
1902	78	142
1903	85	152
1904	81	168
1905	75	158
1906	89	174
1907	107	215
1908	99	198
1910-1912	107	307

When World War I broke out, state-obrok payments from the peasants of Siberia were immediately increased by 16% and taxes on land officially owned by peasants who were not mem-

[84] Based on Appendix Tables 1 and 2.

bers of a mir were increased by 100%.[85] In order to put these figures and those in Table VII.8 above into perspective, the reader is reminded that between 1897 and 1916 the population of Siberia increased by only 41%.[86]

Information on the distribution of the tax burden among the Siberina peasantry classified by income is not available; however, an intensive study of 8,033 households of Tomsk gubernia in 1911-1912 is reported in Table VII.9 The households are grouped by sown area as an approximation to income.

Table VII.9 Tax Burden in Rubles on Households of Tomsk[87] Gubernia in 1911-1912 Gouped by Area Sown

Area Sown	Number of Households	
	Old-Settlers	Migrants
0 acres	46	140
0 to 2.7 acres	187	690
2.7 to 8.1 acres	203	1,204
8.1 to 24.3 acres	797	1,307
over 24.3 acres	463	496
All	1,696	6,337

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[85]A.M. Anfimov, Rossiiskaia Derevnia v Gody Pervoi Mirovoi Voiny (The Russian Village in the Years of the First World War), (Moscow, 1962), p. 260.

[86]See Table III.10 in Chapter III.

[87]Goriushkin, Sibirskoe Krest'ianstvo, p. 402.

Area Sown	Average Number of Persons Per Household	
	Old-Settlers	Migrants
0 acres	3.1	4.3
0 to 2.7 acres	4.1	4.6
2.7 to 8.1 acres	4.7	5.2
8.1 to 24.3 acres	5.9	6.6
over 24.3 acres	8.7	9.7
All	6.3	6.1

Area Sown	Tax Burden in Rubles Per Household	
	Old-Settlers	Migrants
0 acres	15.00	6.25
0 to 2.7 acres	13.36	7.36
2.7 to 8.1 acres	18.04	9.16
8.1 to 24.3 acres	26.04	13.28
over 24.3 acres	44.36	28.16
All	29.04	13.20

Area Sown	Tax Burden in Rubles Per Person	
	Old-Settlers	Migrants
0 acres	4.36	1.21
0 to 2.7 acres	3.16	1.28
2.7 to 8.1 acres	3.32	1.32
8.1 to 24.3 acres	4.16	2.08
over 24.3 acres	5.04	2.36
All	4.24	2.08

Area Sown	Tax Burden in Rubles Per Acre Sown	
	Old-Settlers	Migrants
0 acres	-	-
0 to 2.7 acres	18.90	6.00
2.7 to 8.1 acres	3.10	1.56
8.1 to 24.3 acres	1.59	0.86
over 24.3 acres	1.13	0.79
All	1.51	1.14

The table reveals that the tax burden per household or per person increased as sown area increased except for old-settler households not engaged in agriculture. These households were probably engaged in crafts, so for them sown area was not a good proxy for income. The tax burden per sown acre uniformly declined as area sown per household increased. The effect of the state-obrok tax exemption for migrant households is also apparent.

This concludes our study of the tax burden placed on the Siberian peasantry. Five general points have been made. (1) The Siberian peasantry faced taxes levied by every level of government. (2) Approximately 25% of this burden was in the form of "natural obligations" -- the provision of required goods and services. (3) Official changes in the allocation formulae of the tax burden could not have any effect on factor allocation within peasant households. Up to 1906, taxes were ultimately allocated by the mir as it saw fit. After 1906, taxes were collected by officials directly from peasant

households, but the lack of information about peasant income and wealth made it necessary for them to use the same "rules of thumb" in allocating the tax burden as did the mir. (4) The collection of taxes was very imperfect. Actual receipts were often less than the quotas or estimates set by the central government and gubernia treasuries. There were also an inestimable number of peasant households which escaped taxes altogether. (5) The tax burden on the Siberian peasantry was apparently lighter than that on their European Russian counterparts.

Available figures on the distribution of the tax burden within Siberia reveal no glaring inequities or surprises. It is difficult to gauge the economic effects of the tax burden because any conclusions which require income estimates are very unreliable. The best evidence that the effective tax burden was not sufficiently heavy to stifle economic activity is the simple fact that tremendous growth took place in the agricultural sector over the period 1896 to 1914. Any effort to say more than this would be speculation.

Table 1: State-Obrok Taxes on the Peasants of Siberia for 1899-1908 in Rubles

Years	Taxes Levied	Taxes Received	Percent of Levied Taxes Actually Received	Cumulative Arrears as a Percentage of the Current Annual Levy
		Tobolsk Gubernia		
1899	1,850,000	1,695,818	91.7	8.3
1900	1,850,000	1,713,891	92.6	15.7
1901	1,850,103	1,549,352	83.7	32.6
1902	1,877,161	1,668,274	88.8	43.2
1903	1,884,590	1,853,756	98.3	44.7
1904	1,885,431	1,710,361	90.7	15.3
1905	1,887,705	1,725,669	91.4	23.9
1906	1,887,032	1,858,790	98.5	25.4
1907	1,879,817	1,920,181	102.2	22.9
1908	1,888,817	1,947,509	103.1	19.5
		Tomsk Gubernia		
1899	1,623,453	479,350	29.5	70.4
1900	1,895,000	2,567,901	135.5	38.9
1901	1,895,000	1,140,261	60.1	79.0
1902	1,895,000	1,561,976	82.4	96.9
1903	1,895,000	1,721,081	90.8	105.7
1904	1,838,746	1,654,400	89.9	39.7
1905	1,783,639	1,464,034	80.1	57.8
1906	1,950,641	1,924,735	98.7	58.7
1907	1,960,641	2,491,748	127.1	30.2
1908	1,947,347	2,105,609	108.1	21.9
		Yeniseysk Gubernia		
1899	353,839	299,467	84.6	15.9
1900	354,653	338,365	95.4	20.5

(Continued)

Years	Taxes Levied	Taxes Received	Percent of Levied Taxes Actually Received	Cumulative Arrears as a Percentage of the Current Annual Levy
1901	354,683	311,824	87.9	32.6
1902	348,727	305,634	87.6	44.2
1903	351,337	360,025	102.4	41.4
1904	369,175	306,006	82.8	57.2
1905	372,025	259,120	69.6	68.1
1906	378,502	281,348	74.3	92.5
1907	382,098	499,524	130.7	60.6
1908	427,041	399,855	93.6	60.0
		Irkutsk Gubernia		
1899	319,849	292,015	91.3	8.7
1900	320,072	295,503	92.3	16.4
1901	321,533	302,318	94.0	22.8
1902	321,809	284,014	88.3	34.5
1903	321,877	247,331	76.8	57.7
1904	321,339	297,286	92.5	29.3
1905	321,965	249,016	77.6	52.0
1906	323,335	303,938	94.0	58.2
1907	324,631	337,187	103.9	54.1
1908	324,658	401,491	123.7	29.9

Source: L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p. 400.

Table 2: Zemstvo-Type Gubernia and Volost' Level Collections from Peasants of Siberia for 1899-1908 in Rubles

Years	Taxes Levied	Taxes Received	Percent of Levied Taxes Actually Received	Cumulative Arrears as a Percentage of the Current Annual Levy
		Tobolsk Gubernia		
1899	-	-	-	-
1900	481,542	319,063	66.3	138.0
1901	469,714	528,268	112.5	123.4
1902	483,441	506,933	104.9	113.0
1903	476,562	540,201	113.4	100.8
1904	478,500	495,949	103.6	96.6
1905	488,848	483,198	98.8	55.9
1906	486,903	509,734	104.6	87.1
1907	487,876	571,903	117.2	69.5
1908	500,287	571,812	102.3	31.5
		Tomsk Gubernia		
1899	132,552	121,306	91.5	33.0
1900	352,200	191,112	54.3	56.3
1901	351,695	317,312	90.2	69.5
1902	351,888	338,354	96.2	70.0
1903	351,202	335,256	95.5	74.5
1904	514,348	499,009	97.0	55.4
1905	435,232	458,912	105.4	58.8
1906	503,234	516,867	102.7	46.5
1907	506,332	647,833	127.9	18.2
1908	508,790	540,165	106.2	12.2

Years	Taxes Levied	Taxes Received	Percent of Levied Taxes Actually Received	Cumulative Arrears as a Percentage of the Current Annual Levy
		Yeniseysk Gubernia		
1899	154,620	137,919	89.2	41.5
1900	312,171	260,243	83.4	36.9
1901	309,863	323,970	104.6	20.9
1902	325,620	304,892	93.6	26.6
1903	356,375	339,071	95.1	23.5
1904	349,782	323,378	92.5	28.8
1905	363,071	308,028	84.8	42.6
1906	414,801	341,405	82.3	54.9
1907	417,686	495,816	118.7	35.8
1908	470,522	449,456	95.5	36.0
		Irkutsk Gubernia		
1899	165,054	146,524	88.8	44.5
1900	280,878	215,081	76.6	53.6
1901	280,878	315,853	112.4	41.1
1902	281,033	246,494	87.7	52.3
1903	339,194	278,998	82.3	60.5
1904	337,663	342,152	101.3	59.1
1905	338,934	306,011	90.3	68.5
1906	378,315	345,722	91.4	69.9
1907	379,507	404,247	106.5	63.1
1908	381,812	447,175	117.1	47.2

Source: L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p. 401.

Table 3: Average Annual Tax Collections in Siberia for the Period 1910-1912 in Rubles

Gubernia	State-Obrok Taxes	Zemstvo-Type Gubernia and Volost' Taxes
Tobolsk	1,855,000	888,500
Tomsk (State lands)	510,000	196,205
Tomsk (Kabinet Lands)	2,122,000	818,470
Yeniseysk	447,000	567,681
Irkutsk	337,000	552,680
Total	5,271,000	3,023,536

Gubernia	Mir Collections	Value of Natural Obligations	Total Taxes
Tobolsk	940,000	921,676	4,605,676
Tomsk (State Lands)	479,260	614,523	1,799,488
Tomsk (Kabinet Lands)	2,320,790	1,899,488	7,160,698
Yeniseysk	483,976	428,440	1,907,097
Irkutsk	718,262	694,227	2,302,169
Total	4,922,288	4,558,354	17,775,128

Source: V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria, (Novosibirsk, 1966), p. 212.

Chapter VIII: Government Policies Directly Concerned With Siberian Agricultural Development

The Tsarist government policies directly concerned with Siberian agricultural development fall into three categories: policies concerned with land ownership and allocation; policies to promote the purchase and use of advanced agricultural machinery in Siberia; and government aid to Siberian agriculture through the provision of technical, veterinary, and educational assistance.

A. Policies Concerned With Land Onwership and Allocation

THe land-owning and land-use structures of Siberia were in a state of flux even in the middle of the nineteenth century. Drastic changes and accompanying confusion, however, became apparent only in the 1890's when the construction of the Trans-Siberian Railway opened Siberia to massive migration of land-hungry peasants from European Russian and also provided an outlet for the produce of Siberia's budding commercial agriculture.

In order to understand Siberia's land tenure arrangements, it is helpful to think of them along two separate lines and at three separate levels. The two lines are official and legalistic landownership and unofficial but customary peasant land-use. Almost all the land of Siberia was the official property either of the State Treasury or of the Kabinet (the Tsar's household)[1]; hence, there was

little need for legislation concerning land ownership. And there was so much land available that it was not considered worthwhile in most cases to divide the land into parcels, rent them out, and police the rental agreements. The result was that early Siberian peasants often settled on State and Kabinet lands and treated the land as their own private property. Custom became the arbiter in deciding questions of land-use among the peasants. These two structures of land tenure, official ownership and customary land-use, existed separate from each other until they began to conflict in the late nineteenth century.

The three separate levels at which land ownership and use had to be defined were as follows: between State Treasury and Kabinet on the one hand and the peasant society in general on the other; between different peasant social units or communes; and between individual peasant members of the commune.

Government policy concerning land tenure, like its tax allocation policies, stopped at the commune or mir level at which the commune took over the allocation function. THis section will be concerned largely with the first two levels at which land ownership and use had to be defined: decisions

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[1] Aziatskaia Rossiia, Vol II, Zemlia i Khoziaistvo (Asiatic Russia, Vol. II, Land and Economy), (Petersburg, 1914), p. 532.

of land allocation among individual peasant members of the commune will be discussed in detail in Chapter IX below.

For administrative purposes, Siberia was divided into gubernias and oblast's. These in turn were divided into smaller administrative units called uezds. The uezds were composed of volost's -- the smallest administrative unit which might cover up to 4 million acres and contain several village-communes 50 to 60 miles apart. The volost' covered too large an area to govern effectively and maintained no representatives in its constituent village-communes. It kept the records and collected taxes from each commune as a whole, not from individual members. Thus, the economic, social, and political life of the peasant were insulated from the government by his commune.

Relevant legislation concerning land tenure stretches back to 1822 when the State introduced official private property into Siberia. Two laws were enacted.[2] One appropriated land to be granted to absentee landlords in turn for service in the Siberian government bureaucracy. This attempt failed since the income from land was virtually zero; labor was the scarce factor.[3] The second law set aside lands in

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[2] Aziatskaia Rossiia, Vol. II, p. 570-571.

[3] See Chapter VI, Section B above.

the Akmolinsk and Semipalatinsk oblasts for sale to Cossack officers and officials of Siberian Cossack troops. This law has more success only because the relative peace of Siberia allowed many Cossacks to manage their land themselves. A later law prevented a Cossack officer or official from renting out more than one third of his holding; hence, he was prevented from becoming an absentee land-owner even when the growing scarcity of land would have made it possible.[4]

In 1835, a commission was formed to survey and apportion the lands of Tobolsk, Tomsk, and Yeniseysk gubernias and Omsk uezd. This survey set a per male norm for commune land-holding. A village exceeding this norm had its excess land removed from its use and placed in an immigrant land fund.[5] This law was also ineffective since the hoped for influx of immigrants was not forthcoming.

Between 1835 and 1871, although various survey commissions continued to operate, not a single law concerning rights to land use was enacted.[6] In 1877, more lands were allotted for the Cossacks bringing the total to 1,350,000

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[4] Aziatskaia Rossiia, Vol. II, p. 573.

[5] Aziatskaia Rossiia, Vol. II, p. 552.

[6] Aziatskaia Rossiia, Vol. II, p. 552.

acres.[7]

In 1885, a new law was passed allotting to old-settlers' communes 40.5 acres per male and 8.1 acres for each new male addition. According to this law, the old-settler communes of Tomsk and Tobolsk gubernias were guaranteed use of some 47.25 million acres.[8]

In 1898, another survey law was passed with the intention to separate once and for all those lands belonging to the peasantry from those owned by the State Treasury and Kabinet. This herculean task was to be accomplished in ten years. But by 1908 only 24% of the general land area of the four Siberian gubernias had been surveyed.[9]

In 1901, a law was enacted permitting sale of Treasury lands to private individuals but only with the approval of the appropriate government departments and the Tsar. The results of this law were negligible as the following figures show.

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[7] Aziatskaia Rossiia, Vol. II, p. 571.

[8] Aziatskaia Rossiia, Vol. II, p. 553.

[9] Aziatskaia Rossiia, Vol. II, p. 553.

Table VIII.1: Area of Land Privately Owned in Siberia After[10] 1901 Law Permitting Sale of Treasury Lands to Private Individuals

Governing District	Area Privately Owned in Acres
Tobolsk gubernia	1,034,100
Akmolinsk oblast'	853,200
Yeniseysk gubernia	245,700 (mostly forest)
Amur oblast'	121,222 (435 owners)
Tomsk gubernia	99,900 (77 owners)
Primorskaia oblast'	48,352 (136 owners)
Irkutsk gubernia	22,545
Total	2,425,019
Total Land Fund	491,670,000
Percentage of Land Fund Privately Owned	0.5%

[10] Aziatskaia Rossiia, Vol. II, p. 571-573; Table III.5 of Chapter III.

These lands were usually either unused or rented out, but seldom worked by their owners.

The single law of greatest important for the land tenure system during this period was enacted in 1904. It gave each Siberian peasant the right to demand the partitioning of his own land from that of the commune.[11] Up to this time, the State had refrained from directly interfering with the land tenure system within the commune. The State's various activities had only affected the commune indirectly by either assigning more members from among the immigrants or by removing "excess" land from the commune's jurisdiction. Beginning in 1904, however, the State began to formally take over the land-allocating authority of the commune. It also favored non-communal forms of land-holding through other instruments such as loans to new settlers. In 1904, the two separate lines of land tenure finally came into conflict.

The "Pandora's box" of the restructuring of land ownership in Siberia was forced open by the influx of land-hungry peasants from European Russia which increased greatly with the opening of the Trans-Siberian Railway. However, once the issue was opened, it was joined on all sides by various groups supporting their own interests. The Treasury and the

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[11] Aziatskaia Rossiia, Vol. II, p. 562. The peasant was not required to leave the commune, however.

Kabinet wanted their lands separated from those of the old-settler peasant communes to provide new lands for immigrants and to gain revenue from rents -- the latter being of great importance to the Kabinet. Large land-holding peasants wanted their rights to the land confirmed. Land-poor peasants wanted their rightful shares of land to work or to rent out to wealthy neighbors with more workers and animals. Communes wanted full possession of fields they shared with neighboring communes. Even the nomads were interested: powerful clans often prevented poorer or less well-armed nomads from grazing their stock on the open plains.[12]

The urge to have the unwieldy volost' portions broken down into smaller land units first arose among the old-settlers of Western Siberia in the 1860's. Village communes were arguing amongst themselves for possession of the best fields.[13] The government at first failed to react to this need for surveying and determination of holdings, so old-settlers measured out their own land for themselves. In some cases the village elder simply went out, sometimes with a length of

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[12] Aziatskaia Rossiia, Vol. II, p. 534.

[13] L.F. Skliarov, Pereselente i Zemleustroistvo v Sibiri v Gody Stolypinskoi Agrarnoi Reformy (Migration and Land-Use Structure in the Years of the Stolypin Agrarian Reform), (Leningrad, 1962), p. 253.

rope for making straight lines, looked things over and declared the land boundaries of his village and of the various members of his village.[14] In the early 1890's, boundary markers were in common use only in the Western half of Tobolsk gubernia.[15] Needless to say, many old-settlers took advantage of the opportunity to enlarge their holdings through simple seizure. The apparent injustice of the survival of vestiges of the land seizure custom in a time and place in which land was no longer a free good is dramatized by this quotation from an historian who studied a single village located 25 kilometers from Irkutsk: "Because of the existence even now of seizure use of lands, the best lands wound up in the hands of powerful families, sowing without any payment hundreds of desiatinas; at the same time the less powerful families might have 2 or 3 desiatinas of already worked out, poor land."[16]

The State was unable to accomplish the task it had set for itself in 1898 -- to completely survey the lands of Siberia and clearly separate peasant from State and Kabinet

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[14] Aziatskaia Rossiia, Vol. II, p. 562.

[15] Skliarov, p. 253.

[16] M.V. Zagoskin, Odna iz Sibirskikh Obschin (Selenie Granovskoe) (One of the Siberian Communes (The Village Granovskoe)), (Irkutsk, 1891), p. 79.

holdings. Allotment notes finally confirming use of a given parcel by peasants and distributing the tax responsibilities among village members were composed only for an area totalling 4,050,000 acres -- an area equal to only 1.7% of the Siberian land in peasant use.[17]

According to A. Uspensky, who published the periodical Questions of Colonization, in 1908, out of 36 uezds composing the 4 Siberian gubernias and Zabaikal oblast', land structure and survey work was still required in 32.[18] The structure of land-sue had become chaotic. The authority of the commune had been undermined, but a complete State-sponsored land ownership system had not been developed to take its place.

The southern parts of Western Siberia were officially divided into communes composed of 2 or 3 villages or in some cases single-village communes with legally defined borders. Plowland and hayfields were distributed in proportion to the male members of each household. In the northern parts, the volost' commune predominated. In the Eastern Siberian gubernias, there were few single-village communes

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[17] Pereselenie i Zemleustroistvo za Uralom v 1906-1910 gg. (Migration and Land-Use Structure Beyond the Urals in 1906-1910), (Petersburg, 1911), p. 68; Table III.5 in Chapter III.

[18] A. Uspenskii, "Predstoiaschee Zadachi po Zemleustroistvu v Sibiri," Voprosi Kolonozatsii ("Impending Problems of Land-Use Structure in Siberia," Questions of Colonization), 1908, #3, p. 49.

due to the low population density; the volost' commune prevailed. Pasturage was shared among a number of villages. Hayfields, in short supply and important to maintain livestock over the winter, belonged exclusively to one village and were usually distributed in proportion to the number of males in the household. Surveying was further complicated by the fact that many villages had ignored volost' boundaries.[19] Surveying parties were organized by the volost' authorities and elders sometimes "forgot" to mention village holdings within the boundaries of other volost's. The government still had its two problems to solve: to institute a workable land tenure system in Siberia and to shift "excess" old-settler holdings into the immigrant land fund.

The survey and land tenure policy of the Russian Imperial Government affected land ownership and use of three major groups: the "starozhily" which I translate as "old-settlers" -- usually defined as those arriving in Siberia before 1896; the native population of Siberia; and the "pereselentsy", i.e. "immigrants" or "new settlers" -- those arriving from European Russia after 1986. The surveys were not concerned with all the land of Siberia, but only with that part of it suitable for agriculture and other peasant economic activity (fishing, trapping, herding, and so forth).

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[19]Skliarov, p. 255.

The areas of the various lands potentially involved in such surveying have already been reported in Table III.5 of Chapter III above.

The shifting of unoccupied land into the immigrant land fund presented no problem for the State except for the reluctance of the Treasury and especially of the Kabinet to lose part of their holdings. The shift was not so easy when the lands involved were already occupied by old-settlers or native. The effects of the redistribution on the old-settlers will be discussed first.

According to official data, the total area in use by the old-settlers followed the following pattern.[20] The old-settlers occupied only 6% of the total land area of Siberia and from 14% to 18% of the land fund useful for peasant economic activity. The growth in the land area at their disposal over time is reflected in the following figures.

Table VIII.2: Land Area in Use by Old-Settler Peasants[21] Measured in Millions of Acres

Gubernia or Oblast'	1880's	1890's	1900's
Tobolsk	28.4	29.7	36.7
Tomsk	13.5	13.5	14.0
Yeniseysk	11.9	13.5	13.2
Irkutsk	7.0	12.2	10.8
Zabaikal	7.0	13.5	15.7
Total	67.8	82.4	90.4
Percentage of Total Land Fund	14%	17%	18%

In a government circular issued on December 23, 1906, it was decided that land structure survey work would continue only in those communities in which it had already begun. Immigrant parcels were to be created from land falling into any of the five following categories: (1) land "excesses" remaining in use of the local population; (2) expected excesses in districts in which the new land structure system had not yet been introduced; (3) "excesses" in use by non-Russian peasants; (4) state-obrok articles or certificates of rental (involving land rented out to peasants) except those referring to land rented to hardship villages in need of land or to the sites of factories, mills, or other structures; and (5) State-owned forests except for those specially needed by local peasants.[22] In addition, old-settler holdings were to be disturbed only after vacant land in the area had been exhausted. Nevertheless, old-settler holdings were often tapped for the immigrant land fund well before vacant State and Kabinet land had been exhausted.

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[20]V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria (The Siberian Village on the Eve of October), (Novosibirsk, 1966), p. 12-13.

[21]Tiukavkin, Sibirskaia Derevnia, p. 12-13; Table III.5 of Chapter III.

[22]Skliarov, p. 256.

A norm of 40.5 acres per male had officially prevailed. Yet many settlers, both old and new, complained about the shaving of even this norm in the gubernias of Western Siberia. The same type of abuse by surveying officials was reported in the southern uezds of Yenisysk and Irkutsk gubernias -- especially Kansk, Minusinsk, and Balagansk.[23]

In some cases, old-settlers also got more than the 40.5 acre norm. This could be done legally if the old-settler occupant had developed and improved the land himself. In such cases the allotment could reach 135 acres per male. Also, peasants who had cleared and developed taiga (forest) land were allowed to keep the fruit of their labor.[24] Another exception was the Far East -- that part of Siberia bordering the Pacific. Up to 1901, the normal allotment had been set at 270 acres per family to encourage agricultural development. The survey laws with their allotment norms did not extend to the Far East.[25]

By 1906, the widespread practice of shaving the 40.5 acre norm became official. A new norm of 21.6 to 24.3 acres per male was instituted. Between 1906 and 1914, 22.5% of the old-settler communities of Yeniseysk gubernia undergoing land restructuring received less than 35.1 acres of land

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[23]Skliarov, p. 258.

[24]Aziatskaia Rossiia, Vol. II, p. 555-556.

[25]Aziatskaia Rossiia, Vol. II, p. 560-561.

(both suitable and unsuitable for agricultural use) per male. The proportion of land unsuitable for planting approached extremely high levels in some places: in the volost's of Minusinsk uezd from 35% to 86%; in those of Achinsk uezd from 21% to 63%; and in Krasnoyarsk uezd from 38% to 42%.[26] Even admitting that some of this land might have been "unsuitable for planting" only because it was meadow or grazing land, the norm seems quite low especially when one considers that meadow or grazing land is usually less productive per unit area than is good plowland.

A quasi-official source claims that surveyers took into full consideration the desires and needs of the old-settlers whose lands were being repartitioned and reached full agreement with them,[27] and that such repartitioning was made necessary only because the old-settlers appropriated the best land for themselves.[28]

Skliarov, a Soviet scholar, on the other hand accuses the Imperial Government of taking advantage of the old-settlers in a number of ways besides merely shaving the size of the allotments. Administrators involved in land restructuring were allowed to cut off parcels of no apparent importance to land relations internal to the commune and to expro-

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[26] Skliarov, p. 259.

[27] Aziatskaia Rossiia, Vol. II, p. 566.

[28] Aziatskaia Rossiia, Vol. II, p. 560.

priate even supposed excesses.[29]

The burden of proof was shifted to the peasant: he had to prove that the parcel was an integral and necessary part of his or his village's holding. Administrators usually expropriated the best lands belinging to the old-settlers, but the evidence of this practice is largely the recorded complaints of the old-settlers themselves. These lands sometimes then ended up in the hands of wealthy neighbors or were retained by the Treasury or Kabinet and rented out -- even back to the original user.[30] The Treasury and especially the Kabinet would then donate less valuable land of its own to the immigrant land fund. In the forest areas of Eastern Siberia, land structure parties revealed a preference for expropriating cleared land or those forst parcels which could be most easily cleared. The peasants of Tomsk gubernia from 1898 to 1903 lost a total of 1,485,000 acres during land surveying and restructuring.[31] This was less than 1% of the total land area of Tomsk gubernia.

The following changes took place in land ownership in Yeniseysk gubernia in 1913 due to the restructuring of old-

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[29]Skliarov, p. 260.

[30]Skliarov, p. 260.

[31]Istoriia Sibiri s Drevneishikh Vremen do Nashikh Dnei, Vol. III, Sibir'v Epokhu Kaptializma (History of Siberia from Ancient Times to Our Days, Vol. III, Siberia in the Epoch of Captialism), (Leningrad, 1968-1969), p. 206.

settler holdings.

Table VIII.3: Changes in Landownership in Yeniseysk Gubernia[32] in 1913 Due to the Restructuring of Old-Settler Holdings

What Was Done	Acres Involved
Added to State Lands	249,691
Taken from Peasant Lands	1,852,443
Transferred to Immigrant Land Fund	231,984
Remained in State Possession	1,620,459
State Share of Total Useful Land After Restructuring	14.5%

Tha above table is incomplete since it does not include those lands rented to old-settlers which after 1907 were withdrawn from their use and rented to new settlers or donated to the immigrant land fund. The figures indicate that the State was an important landowner in Yeniseysk gubernia even after the survey and restructuring project.

Skliarov asserts that the old-settlers were treated even worse by land-survey teams on Kabinet lands where expropriation was more efficient. The Kabinet went so far as to complain formally to the Altai government about its required contributions to the immigrant land fund.[34] In 2 volost's of

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[32]Skliarov, p. 262.

[33]Skliarov, p. 262.

[34]Skliarov, p. 264

Barnaul uezd, Sharchinsky and Kulikovsky, old-settler holdings dropped almost immediately from 37.8 - 40.5 acres per male soul to 21.6 - 2.43 acres and all forests became Kabinet property.[35]

Government pressure was put on the Kabinet not to treat old-settler holdings in any particular way but only to make room for more new immigrants. The Kabinet responded to this pressure in part by expropriating exceptionally good land for its own use and then donating poorer land to village holdings. Immigrants could then be assigned to these villages since they had more land than the per male norm allowed. Skliarov even claims that in some cases peasant holdings were completely surrounded by Kabinet property.[36] The peasant was then forced to rent a path to his fields. The Kabinet was also accused of making deals with wealthy peasants willing to pay to have their allotments expanded and of using land restructuring as a threat to force village-communes to accept new members. This may have been the main reason for an important policy change: after 1906, all immigrants were settled on parcels set aside for them; none were accommodated by old-settler villages as before.[37] This practice had fostered shortages of good land among old-settlers in those

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[35] Skliarov, p. 266.

[36] Skliarov, p. 266.

[37] Istoriia Sibiri s Drevneishikh Vremen do Nashikh Dnei, Vol. III, p. 303.

areas in which immigrants tended to concentrate. After the restructuring of 1908, the old-settlers of Tiukalensky uezd of Tobolsk gubernia were left with allotments of from 18.9 to 2.7 acres of often poor land per male. Similar problems also arose in Tomsk, Yeniseysk, and Irkutsk gubernias if peasant complaints are to be believed.[38] Old-settlers also found themselves in disputes with administrators who settled immigrants on non-existent or already occupied parcels, unregistered immigrants who simply settled where they might without consulting either the village or the Immigration Commission, and surveyors who ignored quality in determining the size of the parcels.

The later actions of the Imperial Government itself tend to bolster Skliarov's accusation that administrators and surveyors were too free in cutting the area of old-settler holdings. By January 1, 1911, only 2,345 acres of arable land had been returned to old-settler holdings from the immigrant land fund due to peasant complaints and hardships. But from 1911 to 1916 in Tobolsk and Irkutsk gubernias alone, a total of 480,195 acres of land (of which 357,628 acres were good plowland and 39,074 were forest) were returned to the old-settlers.[39] Such action was taken only in the case of obvious or extreme need.

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[38]Skliarov, p. 270.

[39]Skliarov, p. 271.

The land-structuring activity of the Imperial Government may be viewed as affecting the native population of Siberia in three successive stages. Many native tribes, especially in the North, were complete nomads supporting themselves with hunting, fishing, and herding. As the immigrant land fund engulfed more and more of the "excess" land on which these tribes wandered, it became necessary for them to settle down and practice a more land-intensive type of animal husbandry. In general, the further east one moved across Siberia, the less had this process advanced since most immigrants settled in the western parts of Siberia. Thus in 1914, the Buryats of Zabaikal oblast' were still half-nomad whereas their brothers in Irkutsk gubernia were becoming settled.[40]

This process usually began with a decline in the changes of residence throughout the year -- maybe only twice a year rather than four times. Then wealthier natives might construct more permanent dwellings near their winter and/or summer pastures. Finally, winter pastures were fenced in as were hayfields with the latter held in common. Each male's share of the hayfield was proportionate to his contribution to the fencing and might be handed down to his son. As more land was needed for the immigrant land fund, the State further reduced native allotments. This forced some

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[40] Aziatskaia Rossiia, Vol. II, p. 551.

tribes to abandon their old ways and take up agriculture. In the third stage, native peasants had their allotments further reduced and were forced to grow the crops and practice the intensive agriculture introduced by the European Russian immigrants interspersed among them. They became Russified peasants. Needless to say, this three-stage process did not work smoothly in all cases, but at least may be considered as the implicit blueprint underlying the restructuring of native lands in Siberia.

Skliarov characterizes the policy of the Russian Imperial Government as one of relieving the natives of Siberia of as much land as possible as quickly as possible. After each surveying expedition, the natives had their land norms lowered.[41]

In 1896, the norm was set at sufficient land for each male to maintain 24 head of cattle. In 1907, the norm was lowered to 16 cattle and a horse.[42] These norms were first instituted in the steppe region of Central Asia and then spread north into the 4 Siberian gubernias, Zabaikal oblast', and the Far East. The norms were usually translated into the land area required to sustain the given size of herd in one volost'; this livestock-land ratio was then applied to

[41]Skliarov, p. 276-277.

[42]Skliarov, p. 278.

[43]Skliarov, p. 279-281.

the entire uezd. The resulting land-area norms often failed to correspond to the real needs of the population. Pasture land and fishing lakes rented to the natives under state-obrok articles were expropriated for the immigrant land fund without recourse. The natives complained that land restructuring left them too poor to begin farming and with insufficient land to continue livestock breeding. Those natives who did take legal action against the Kabinet's expropriation of their land without compensation found that the courts were biased or that the Kabinet often ignored court orders for compensation.[43]

The effect of land restructuring on the native economy was almost universally disruptive. A law enacted in 1899 called for such restructuring for the entire population of the Altai -- immigrants, old-settlers, and natives. A norm of 48.6 acres per male was established with the result that 26,200,000 acres were to be removed from the holdings of the Altai tribe and old-settlers. This time the government responded to massive protests and 80% of the native Altai mountain nomads were exempted from the law. The exemption lasted until 1906 when a ukase was issued demanding that all lands which could possibly be freed from use by present occupants be rented to the State Treasury for the immigrant land fund. The rental payment of 8 kopeks per acre of good land was to be paid to the Kabinet annually for 49 years;

such payments would have provided the Kabinet with 15 million rubles ignoring interest earnings. In 1908, the rent was raised to 15 kopeks per acre. Land restructuring of the Altai tribe was finally completed in 1913. They were left with holdings of approximately 40.5 acres per male.[44]

Between 1893 and 1905, the non-Russians of Akmolinsk, Semipalatinsk, and other steppe oblast's lost over 8.1 million acres to the immigrant land fund and 45.9 million acres for Cossack settlements. The results of land restructuring here were thousands of landless Kirghiz tribesmen.[45]

In 1908, the decision was made to raid the lands of the Hakasi tribe of Yeniseysk gubernia for the immigrant land fund. Their norm was set at 35.1 to 40.5 acres per male, but much of their land was useless.[46] For example, out of 48.6 million acres in the southwest part of Minusinsk uezd, only 1,350,000 were suitable for agriculture. The rest was forestless dry steppe which the Hakasi used for extensive grazing. Early in 1912, 327,780 acres of that precious 2,350.000 went into the immigrant land fund with 655,560 earmarked to follow it later that year. The Hakasi ended up with holdings too small to maintain livestock and

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[44] Istoriia Sibiri s Drevneishikh Vremen do Nashikh Dnei, Vol. III, p. 95-96.

[45] Skliarov, p. 276.

[46] Istoriia Sibiri s Drevneishikh Vremen do Nashikh Dnei, Vol. III, p. 85.

unsuitable for agriculture because of soil and climate conditions.[47]

The Buryat tribes up to 1905 kept requesting that their pasturage not be cut. Many of these requests were ignored and expropriation of Buryat holdings expanded. Finally, between 1910 and 1912, all Buryat vedomstvos were subjected to land restructuring.[48] During this period, they lost 2,285,809 acres of "excess" arable fields, hayfields, grazing land, and pasturage. Some vedomstvos lost as much as two thirds of all their land and were left with only worn-out fallow fields. There were even cases in which tribesmen had to drive their herds as much as 10 versts (6.6 miles) across land earmarked for the immigrant fund to reach their pastures. Some Buryats asked that the expropriated land be rented back to them; instead, it was rented to large "experimental livestock breeders" of Russian extraction. The Buryats could still raise livestock on their new 40.5 acres per male norm but agriculture seemed impossible. Their complaints were ignored. The seriousness of their situation is revealed by the fact that in 1913 the Buryats of the Irkutsk gubernia began a massive migration of their own to Mongolia in search of land.[49]

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[47] Skliarov, p. 281, 286.

[48] The translation for vedomstvo is "department". For administrative purposes, the native tribes in Siberia were divided into departments.

[49] Skliarov, p. 282-283, 287.

There were many more Siberian tribes who were affected by the land restructuring policy of the Imperial government. The above are only offered as examples. In general, government policy was successful. Expropriation speeded up the settlement and peasantification of the nomad tribes and provided more land for the immigrant land fund. The nomads were induced to settle down peacefully both by the activity of a special administration designed to aid this process and by the presence of extra troops and Cossacks. By mid-1913, in the 4 Siberian gubernias 203,193 of a counted 372,430 non-Russian residents were settled in 462 villages of 92 volost's. In 1905, Tomsk gubernia had counted 8,078 nomads; in 1914, only 1,158.[50] Between 1893 and 1906, the nomadic tribes beyond the Urals had lsot 54 million acres of their best lands. Between 1906 and 1914, 108 million more acres of "excess" land belonging to non-Russians was expropriated. Most of this land went into the immigrant land fund, but some was retained by the Treasury and Kabinet or found its way into the hands of wealthy and influential old-settlers. This great transfer took place without the violent conflicts which marked the opening of the American West because Siberian natives were less prone to violence than American Indians.

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[50]Skliarov, p. 284.

Previous paragraphs of this section have dealt with the effects of land expropriation for the immigrant land fund -- the first impact of the Imperial Government's land restructuring policy on Siberian agriculture. The second impact of this policy stems from the holdings provided from the fund: the number of them, their area, and their type. Most of these holdings went to immigrants just arriving from European Russia. In addition, some land expropriated from the land fund was returned to old-settlers in cases of extreme need. Also, old-settlers were allowed and often encouraged to change their own land tenure systems even if their holdings never entered the immigrant land fund. Land survey teams could provide new holdings in roughly 4 possible forms. The first and simplest was to survey an area large enough for an entire commune (usually 10,800 to 21,600 acres) making sure that the land type mix would be able to support the various needs of a community (sufficient plowland, pasturage, water and so forth). The allocation of individual parcels was then left to the commune. The second form was a mixture of commune and private holdings. Some parcels were marked by the surveyors to become the property of individual households. The third form called for all land to be divided into individual parcels or <u>otruba</u>, each to be assigned to a household. These three forms all had one common factor: peasant dwellings wer all located in a central village. The fourth type called the <u>khutor</u> consisted of a single household

dwelling and all the fields owned by the household contained within one continuous border. The khutor, then, was the Russian version of the family farm. It was also the most difficult for the surveying team to form since the proper mix of land-types had to be located in adjacent parcels.

Up to 1906, the form of land restructuring in Siberia had been determined by 3 basic factors: the drive to separate State and Kabinet property from peasant lands, the need to provide parcels for the influx of immigrants, and the shortage of surveyors to do the job. All 3 of these factors fostered the formation of commune and mixed (communal and privately held) parcels. Commune parcels could be formed most easily of the 4 types and could accommodate whole villages of immigrants at once. In 1906, Stolypin began his reforms and directed his policies toward the liquidation of the commune and the creation of khutors and otrubs.[51] But the effects of his policy change did not reach Siberia until 1908 when the surveying of commune holdings began. Stolypin's liquidation of the commune in European Russia was based on the ukase of November 9, 1906 and later on the laws of June 14, 1910 and May 29, 1911. None of these legal acts extended to Siberia. The Siberian internal (to the commune) property survey proceeded under Articles 62 and 66 of the General

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[51] Istoriia Sibiri s Drevneishikh Vremen do Nashikh Dnei, Vol. III, p. 300-303.

Law Concerning Peasants. These articles provided that old-settlers, at least, had to pay the costs of having their communes surveyed and broken down into private holdings and that such action could be taken only if two thirds of the members of a village-commune petitioned for it.[52]

Thsu, the letter of the law prevented the Siberian government from directly imposing Stolypin's chief reform on the peasantry of Siberia. The government could and did, however, use the means at its disposal to induce peasants to favor the otrub and especially the khutor type of holding. Loans made to immigrants were easier to obtain and more generous for those settling on private holdings. Khutor holdings were also larger than otrub holdings. For example, in 1908, the average khutor contained 118 acres while the average otrub holdings totalled 96 acres per family.[53]

Also, good land could more often be found in khutor holdings and was more likely to have access roads and other amenities.[54]

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[52]Skliarov, p. 305.

[53]Skliarov, p. 310. The otrub holding did not include the house or the area immediately surrounding it, but this would account for only a small portion of the 22 acre difference between the khutor and otrub types of holdings.

[54]Skliarov, p. 328. Surveyors had been instructed to favor khutors in land quality and amenities so that peasants would be more attracted to them.

In a circular issued on March 31, 1908, the Chief Manager of Land Structuring and Agriculture set aside 250,000 rubles to aid both old-settlers and immigrants through loans to have land surveyed and broken into individual holdings. 27 loans were made in 1908. In 1909, 86 loans were made and applied to a total of 989,550 acres. 79% of this area was devoted to otrub holdings with all land under private ownership except for communal grazing land. The average household in these villages had 2 or 3 otrubs of 40.5 to 54 acres each. 16% of the land area was devoted to khutors, leaving only 5% for village communes.[55]

In 1910, more loans were made and this time were specifically directed toward the formation of separate immigrant villages. 129 settlements were formed with a total area of 1,320,300 acres; 10% of this land was devoted to khutors, 64% to otrub holdings; 25% to mixed villages (otrub with some land held in common); and only 1% to internally undivided villages.[56] For 1912 and 1913, the survey loan fund was expanded to 368,800 rubles.[57]

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[55] Istoriia Sibiris Drevneishikh Vremen do Nashikh Dnei, Vol. III, p. 563.

[56] Aziatskaia Rossiia, Vol. II, p. 563.

[57] Skliarov, p. 306.

From 1908 to 1913, over a million rubles had been loaned to 960 communities for the surveying and restructuring of some 10.8 million acres beyond the Urals.[58]

The status of surveying activity just before World War I is summarized in the table below.

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[58] Aziatskaia Rossiia, Vol. II, p. 564.

Table VIII.4: Totals of Land Restructuring in Siberia From 1906 to 1914 in Thousands of Acres[59]

Gubernia or Oblast'	Total Area Subject to Restructuring	Planned for Allotments	Finally Surveyed	Title Transferred to Occupants
1906-1910	1906-1910	1906-1910	1906-1910	1906-1910
Total Area	90,450	21,713	9,677	4,028
Percent of Total	100.0	24.0	10.6	4.4
1908-1914	1908-1914	1908-1914	1908-1914	1908-1914
Tobolsk	36,801	24,737	14,305	8,451
Tomsk	13,900	12,836	7,995	3,912
Yeniseysk	13,136	14,180*	6,167	4,871
Irkutsk	10,922	10,220	4,363	4,185
Zabaikal	15,692	10,068	4,301	1,731
Total	90,450	72,039	39,828	23,152
Percent of Total	100.0	79.6	44.0	25.5

[*For Yeniseysk gubernia, the area planned for allotments exceeds the total area subject to restructuring. According to another source, the Krasnoyarsk land restructuring party, the area planned for allotments in Yeniseysk gubernia up to January 1, 1914 was only 6,720,300 acres. I strongly suspect that survey teams were assigned quotas which may have been set up before the total area subject to restructuring had been precisely determined.]

[59] Skliarov, p. 295. Totals may not add exactly due to rounding.

In Amur oblast', surveying was only just beginning. In Primorskaia oblast' in 1913, petitions for surveying had just been received from new settlements involving 180,000 desiastins.[60]

The final results of Stolypin's land reform program are summarized below.

Table VIII.5: Totals of Stolypin's Land Restructuring in Siberia in Acres[61]

District	Petitioned for Internal Surveys Villages	Households	Acres Involved
Asiatic Russia Except Turkestan	3,873	364,016	46,864,858
Tobolsk	599	24,650	3,869,548
Tomsk	2,223	238,208	27,848,991
Yeniseysk	351	24,065	3,094,467
Irkutsk	63	3,654	481,324
Four Siberian Gubernias	3,196	290,577	35,294,330

District	Khutors Formed Number	Area	Otrub Parcels Formed Number	Area
Asiatic Russia Except Turketstan	5,392	235,991	66,403	2,373,980
Tobolsk	1,258	59,295	3,110	112,510
Tomsk	765	33,743	10,738	340,922
Yeniseysk	2,449	100,689	4,870	146,000
Irkutsk	45	2,470	642	17,977
4 Siberian Gubernias	4,517	196,197	19,360	617,418

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[60] Aziatskaia Rossiia, Vol. II., p. 564.

The absolute figures of the land reform results look quite impressive especially when one remembers the limited resources available for surveying and the added difficulty of laying out khutor and otrub holdings as opposed to simple communes. The table given below sheds some light on the relative importance of Stolypin's reforms in the 4 Siberian gubernias.

Table VIII.6: Percentages of Surveyed Households Which[62] Converted to Private Holdings

Gubernia	Converted to Khutors	Converted to Otrubs	Total Converted to Private Holdings
Tobolsk	5.1%	12.6%	17.7%
Tomsk	0.3%	4.5%	4.8%
Yeniseysk	10.2%	20.2%	30.4%
Irkutsk	1.2%	17.6%	18.8%
Total	1.6%	6.7%	8.3%

Stolypin's land tenure reform was of some significance but in Siberia at leat, it was not the revolution in land ownership that it had been intended to be. It should further be remembered that the number of villages which petitioned and finally received internal survey services was only 3,196

[61] Skliarov, p. 322-323.

[62] Based on Table VIII.5.

--only 29.3% of the 10,902 rural settlements in Siberia in 1906.[63] The table below gives the average area in acres of khutor, otrub, and communal holdings per household after internal land surveying in those villages which had requested it.

Table VIII.7: Average Areas of Khutor, Otrub, and Communal Holdings in Surveyed Villages[64]

Gubernia	Average Area of Khutor	Average Area Of Otrub	Average Area of Communal Holding
Tobolsk	127.2	97.7	167.9
Tomsk	119.1	85.6	118.3
Yenisesyk	111.0	81.0	145.0
Irkutsk	148.2	75.6	143.6
4 Siberian Gubernias	117.2	86.1	124.2

Table VIII.7 suggests that Stolypin's land reform in Siberia may have been adversely affected or even sabotaged at the lower bureaucratic level. On the average, communal holdings for each peasant family which did not leave the commune were larger than the holdings provided for peasant families which did. Surveying teams were providing the peasants with a very strong incentive to retain communal land

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[63] L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX (The Siberian Peasantry on the Edge of Two centuries: The End of the 19th-The Beginning of the 20th), (Novosibirsk, 1967), p. 370.

[64] Based on Table VIII.5 above.

ownership -- more land per household for those families staying in the commune. Table VIII.7 should also lay to rest the picture of land tenure reform conjured up by Soviet historians of the period -- that of powerful kulaks forcing internal surveys on the village-commune so they could finalize their claim to huge chunks of land and leave the commune's members land-poor.

It also goes a long way toward explaining why Stolypin's reform of land ownership never touched at least two thirds of the villages in Siberia's 4 gubernias.

The advantages of maintaining a residence in the village and of not moving to a new dewlling must have been substantial since on the average 4.2 otrub-type holdings were formed for each khutor even though the otrub holdings contained 31.1 acres less than the khutor.

It would, of course, be possible to cast doubt on the significance of the above two tables if it could be shown that land allotted to private owners was much more productive than that retained by the commune (6% for khutors since on the average commune holdings were 106% of khutor holdings and 44% for otrub holdings cince on the average commune holdings were 144% of otrub holdings), that households which switched to private ownership were smaller than those which remained in the commune (5.7% for khutors since on the average khutor holdings were only 94.3% of commune holdings and

30.7% for otrub holdings since on the average otrub holdings were only 69.3% of commune holdings), or that the aid and services offered by the State or loans were offered to peasants who owned their own land on overwhelmingly better terms than to commune members. No evidence supporting any of these last three possibilities has come to my attention.

Immigrants from European Russia also tended to favor the communal system of land use. OUt of 477 immigrant settlements across Siberia studied in 1911-1912, plowland, hayfields, pasturage, and other fields were in communal use in 413. Eight settlements used an otrub system and 26 were composed of khutors. Thus, private holdings predominated in only 7.6% of the settlements studied. Of the commune settlements, 208 or 46.5% of the total number studied practiced equal division of fields per male soul; 165 or 36.9% practiced some form of land use by right of seizure. The remaining 40 ((.0% of total) were in the process of converting from right of seizure to equal per soul divisions.[65]

The results of this survey should not be surprising. Land use by right of seizure was adopted and retained even after Stolypin's celebrated reforms, especially in Eastern Siberia,[66] among the early immigrants -- roughly, those who arrived between 1893 and 1900. Seizure was a common practice

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[65]Skliarov, p. 396; Tiukavkin, Sibirskais Derevnia, p. 100-101.

[66]Skliarov, p. 396.

right up to 1917 in the forest-steppe of the northern parts of Achinsk, Krasnoyarsk, and Kansk uezds of Yeniseysk gubernia and in the forest zones of Turinsk and Tarsk uezds of Tobolsk gubernia and Berholensk uezd of Irkutsk gubernia.[67] As more and more immigrants crowded into the various settlements, it became necessary to restrict the right of seizure. So the immigrants simply adopted whatever land tenure system they had used in European Russia; thus, immigrants from the central gubernias adopted a communal system with equal alotments per male soul while immigrants from Western and Baltic gubernias requested internal (to the settlement) surveys and adopted khutor and otrub types of private holdings.[68]

Although established villages could be divided into private parcels only after they had petitioned for surveying, the government could and did provide new immigrants with khutor and otrub parcels at their time of settlement. Appendix Table 2 provides a comparison of the provision and settling of private holdings and of communal parcels for immigrant peasants.

This table brings out several important points. First, the number of families which could be accommodated in communal holdings dwarfs the number which could be provided with individual allotments. Second, despite their extremely small

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[67] Skliarov, p. 396.

[68] Skliarov, p. 331.

numbers, a larger proportion of individual allotments were left unoccupied; roughly speaking, for each 1% of communal holdings left unoccupied, 2% of individual allotments were not used. These two facts indicate a definite preference for communal parcels both among surveyors and immigrants. Third, an extremely large proportion of unoccupied allotments were unsuitable for settlement. At first, I considered this an indicator of poor surveying. Soviet sources suggest that such allotments were formed in a mad scramble to find places for all the immigrants pouring out of European Russia; thus, a large proportion of unsuitable allotments were the result of pressure put on surveying parties. However, assuming that all occupied allotments were suitable for settlement, the proportion of unsuitable to total allotments formed in all the immigration districts (except Amur oblast') was only 11.8% for communal portions and 8.3% for individual holdings. No information is given about the cost of fixing up "unsuitable" allotments.

Sufficient material has been presented to reach some conclusions concerning the success of the government's land restructuring program. First, the authority of the commune regarding land ownership had been partially replaced by that of the State. Even those communes which had been left untouched had experienced at least the threat of surveying and expropriation of land for the immigrant land fund. Second,

a beginning had been made in separating State from peasant holdings. Even in 1917, however, in many volost's State land had still not been completely distinguished from peasant property.[69] Third, expropriation of native land had forced many nomads to settle down and had accelerated the peasantification of native tribes. Fourth, a place had been found for most of the immigrants from European Russia. Fifth, Stolypin's reforms had introduced official private peasant holdings into Siberia. Had Siberia been a region with a long tradition of communal land tenure, the proportion of individually owned holdings created in the 9 years from 1908 to 1917 might be impressive. Siberia, however, had a long tradition of private ownership by right of seizure. Even before the restructuring program had been instituted, Siberian peasants had bought, sold, rented and inherited among themselves.[70]

Hence, the private ownerhsip fostered under the Stolypin reforms was not a radical innovation, but an officially sponsored return to common peasant practices of the late nineteenth century. Yet the Stolypin reform in Siberia did not prove to be a means of fostering an independent agricultural middle class in Siberia; instead, it became just another example of successful peasant resistance to government policy.

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[69] Tiukavkin, Sibirskaia Derevnia, p. 11.

[70] Peasant land tenure practices will be discussed in Chapter IX below.

Despite all the restructuring and expropriating for the immigrant land fund, the Siberian peasant for the most part lived and worked as a member of a village-commune.

Tsarist government involvement in land allocation was not limited to its interference in the peasant land tenure system. There was also land owned by the State Treasury and Kabinet which was rented out to peasants and other users. Such land was often included in volost' holdings and might even be interspersed with peasant holdings. This mixing of Treasury and Kabinet land with land acknowledged as belonging to peasant communes or individual peasants led to two problems. It intensified strip-farming and forced peasants to use fields farther from their villages since they naturally preferred to seize land free for the taking rather than pay rent.[71] The second problem arose from the fact that the State was unable to police its scattered holdings effectively. State land seized and used by a peasant family for a sufficiently long time without rental payments became that family's property under peasant custom.[72] Thus, State holdings were steadily disappearing into peasant property. There are even cases on record of peasants squatting on State land and being compensated by railroad and mining companies as the

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[71]Skliarov, p. 252.

[72]Peasant custom was also recognized by some local courts, but not by the higher levels of government.

owners when such land was removed from their use.[73] The State tried to combat this trend with the massive survey discussed above which had been intended to separate State and Kabinet lands from peasant holdings once and for all.

The renting of State and Kabinet (Tsar's household) lands was in many ways different from that of land renting between peasants. First, it was legal and not based on any peasant custom. Second, it usually involved long term renting. In European Russia, state-obrok articles were issued for 1 to 12 years; in Siberia, such articles might be good for even 40 years.[74] Third, it often involved land used for non-agricultural purposes. Fourth, the State and Kabinet could rent to anyone, not only peasants. Fifth, the State and Kabinet could and did rent land in large chunks of thousands of acres.

State and Kabinet lands were rented under state-obrok articles. The obrok was originally a payment in cash or commodities which the Russian serf owed to his master. After the emancipation of the serfs in 1861, the peasant often contracted with his former master to rent land from the master's estate; such contracts were called obrok agreements or articles since they involved cash payments to the former

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[73] Tiukavkin, Sibirskaia Derevnia, p. 120-121.

[74] Tiukavkin, Sibirskaia Derevnia, p. 103.

master just as before. When such agreements involved government land, they were called state-obrok articles.[75] State-obrok articles had been of little importance in Siberia up to the 1880's since there was so much land available that rent could be obtained only for exceptionally good land in favorable locations. Also, the vastness of Siberia made policing of unrented State lands a practical impossibility. Entire communities might squat on unrented State lands for 25 years without being discovered. During this period, they paid neither rent nor taxes and lost none of their sons to military service. Peasant customs might even grant them eventual ownership of the land. All this changed with the coming of the great migration. More peasants meant a higher demand for agricultural land. Land restructuring also forced the Kabinet and State to donate vast expanses to the immigrant land fund, but as noted earlier in this chapter, the best land tended to find its way into State and Kabinet ownership and to remain there.

Up to 1906, state-obrok articles or rental certificates had been auctioned off to the highest bidder, often with many parcels drawing no bids. After 1906, however, the demand for land became so strong that it was necessary to give

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[75] State-obrok articles should not be confused with state-obrok taxes. The former were rental payments while the latter were taxes.

peasants short of land preference in the granting of such articles.[76] Households on rented land could easily be wiped out by having their farms literally bid out from under them.

Statistics on state-obrok articles in Siberia and the income which the Treasury derived from them are discussed in "Data on Obrok Articles" and Tables 1 through 3 in the Appendix to theis Chapter. The general conclusions which may be safely drawn from this information in the Appendix are the following. (1) The State dis not play a role in land renting commensurate with its vast official holdings. Among the reasons for this were inability to prevent squatting under the peasant custom of seizure, failure to have its property clearly surveyed and distinguished from peasant holdings, and required contributions to the immigrant land fund. (2) Rental of agricultural land was a considerable but not a dominant source of State revenue from Siberia. (3) There is some suggestion but no conclusive evidence (which has come to my attention) that rental rates on State lands were used as an instrument to favor large, individually run peasant farms.

This concludes our survey of the Tsarist government's policies affecting land tenure and allocation in Siberia.

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[76] Tiukavkin, Sibirskaia Derevnia, p. 104.

B. The Tsarist Government's Role in the Importation of Agricultural Capital into Siberia

The Tsarist government played a leading role in the opening of the Siberian market for agricultural machinery and equipment. It provided both sales outlets for agricultural equipment in Siberia and credit for Siberian peasants wishing to purchase such equipment.

The first agricultural machinery shops appeared in the early 1890's; by 1900, there were nineteen of them.[77] Between 1893 and 1902, these shops sold some 59,000 agricultural machines and implements.[78] Most of these shops were originally operated by one of two government bureaus: the Ministry of Internal Affairs and the Ministry of Agriculture and State Possessions. Late in the 1890's, control of these shops was consolidated under the Migration Administration, which expanded them.[79]

The ministries of the Tsarist government, not private enterprise, took the initiative in opening up the Siberian agricultural equipment market. These government-owned shops were operated on a commercial profit-making basis to avoid

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[77] These were retail sales shops, not shops for machine construction.

[78] S.V. Sabler and E.V. Sosnovskii, Sibirskaia Zheleznaia Doroga v Ee Proshlom i Nastoiaschem (The Siberian Railroad in Its Past and Present), (Petersburg, 1903), p. 338.

[79] Aziatskaia Rossiia, Vol. I, p. 408; Tiukavkin, Sibirskaia Derevnia, p. 326.

hindering the development of privately-owned agricultural equipment suppliers.[80]

Their purposes were to develop the Siberian market for agricultural equipment, provide supply outlets in more remote and, therefore, less profitable districts, and to regulate the prices charged by private suppliers by providing the peasants with alternative outlets. The State-operated agricultural supply stores were a smashing success as the figures in Appendix Tables 4 and 5 indicate.

The abrupt increase in agricultural equipment sales which took place in 1907 coincided with a similar increase in peasant immigration into Siberia which peaked in 1908. The increase in sales which occurred in 1911 coincided with the repeal of the Cheliabinsk tariff barrier against grain produced in Siberia and exported into European Russia.[81]

Appendix Tables 4 and 5 suggest that the State-run agricultural supply stores took the initiative in opening the Siberian market for agricultural equipment and then allowed private enterprise to continue the expansion.

Private suppliers followed the lead of the State stores and by 1911 there were 600 privately owned supply stores in Siberia -- mostly in cities and towns in which State

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[80] Aziatskaia Rossiia, Vol. I, p. 408.

[81] Tiukavkin, Sibirskaia Derevnia, p. 327. The Cheliabinsk barrier is defined in Chapter VII, Section B above.

stores also operated.[82] In that same year, the Migration Administration operated 83 agricultural supply warehouses with 120 branch outlets. Some 330 peasant credit societies had also been organized for the distribution of agricultural implements and machinery.[83] As the private outlets developed, the stores of the Migration Administration steadily reduced their share of the market. In the fifteen pre-war years from 1899 to 1913, a total of 150,000,000 rubles worth of agricultural machinery and implements were sold in Siberia. The government stores sold 53,500,000 rubles worth or about a third of this total.[84] As noted above, the Migration Administration ran its agricultural supply stores on a commercial basis: from 1898 to 1913, these stores reported total profits of some 3.9 million rubles -- about 7% of total sales. Of this money, some 700,000 rubles were devoted to cultural enlightenment and about 50,000 rubles were devoted to acquainting Siberian peasants with new machinery and equipment. The balance of 3.15 million rubles profit went to build and maintain the Petukhovsky agricultural school and to the central government Treasury.

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[82] Aziatskaia Rossiia, Vol. I, p. 408.

[83] Goriushkin, Sibirskoe Krest'ianstvo, p. 114.

[84] Aziatskaia Rossiia, Vol. II, p. 407-408.

[85] Aziatskaia Rossiia, Vol. I, p. 409-410.

Although one of the purposes of the State supply houses was to force down the prices of private firms which enjoyed local monopolies,[86] the State stores were not above practicing market discrimination when the opportunity arose. Skliarov reports that State stores sold goods to peasant cooperatives at reduced prices after obtaining assurances that the cooperatives would not resell the goods to non-member peasants at prices below those of the nearest State storehouse.[87] Information on the profit margins on equipment and machinery sold by the State supply stores is not to be found. My own opinion is that the general policy goal of the Migration Administration was to perform a public service and to curb the monopoly power of privately-owned outlets while, at the same time, individual State stores attempted to show a profit in any way they could -- including the exploitation of monopoly positions through price discrimination and other means.

In summary then, the distribution of agricultural machinery and implements in Siberia was accomplished through three channels of supply: government-owned outlets under the Migration Administration, peasant cooperative societies, and private firms. The government-owned outlets

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[86]Skliarov, p. 359.

[87]Skliarov, p. 362.

took the initiative in opening up the Siberian agricultural equipment market and in educating the peasantry in the use of the new machinery. The subsequent growth of this market is documented in Appendix Table 5. Skliarov claimes that the State agricultural supply outlets were a dismal failure and offers as evidence government efforts beginning in November, 1912 to transfer State stores into the hands of private entrepreneurs.[88] Skliarov never considers the possibility that the State was liquidating its agricultural supply stores only because they accomplished their purpose.

Although government efforts to open up the Siberian market for agricultural equipment were highly successful, efforts to supply this market with home production were much less successful. Russia as a whole was dependent on foreign suppliers for agricultural equipment, and Siberia in particular was dependent on European Russia and even more so on foreign suppliers or their subsidiaries. In 1914, Siberia had over a thousand storehouses and distribution centers for the sale of agricultural equipment.[89] Yet she had only fifteen plants and workshops engaged in the production of agricultural equipment and parts in that year. This was only 1.5% of the 981 such plants in all of

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[88] Skliarov, p. 367.

[89] Aziatskaia Rossiia, Vol. II, p. 408.

Russia.[90] This figure is much less than Siberia's share of the rural population of the Empire -- about 5%. The growth of the Siberian agricultural capital stock was triggered by the completion of the Trans-Siberian Railway and fueled by the demands of peasant immigrants from European Russia. Between 1901 and 1914, the importation by rail of agricultural equipment into Siberia by weight increased by a factor of sixteen. Eighty percent of this stock went to Western Siberia. The biggest buyers of agricultural equipment were Tomsk gubernia and Akmolinsk oblast'; Tobolsk gubernia was third and Yeniseysk gubernia, fourth.[91] The growing relative importance of Siberia as a demander of agricultural machinery within Russia is indicated by the following table.

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[90]Goriushkin, Sibirskoe Krest'ianstvo, p. 113.

[91]L.M. Goriushkin, Sotsial'no-Ekonomicheskie Predposylki Sotsialisticheskoi Revoliutsii v Sibirskoi Derevnie (The Socio-Economic Preconditions of the Socialist Revolution in the Siberian Village), (Novosibirsk, 1962), p. 71-72.

Table VIII.9: Growth in the Sales of Agricultural[92] Machinery and Equipment in Siberia and Russia as a Whole

Year	Sales in Russia		Sales in Siberia		Siberia's Share in All Sales in Russia
	Rubles	Index No., Base Year is 1900	Rubles	Index No., Base Year is 1900	
1900	27,900,000	100	718,179	100	3%
1911	108,187,000	387	20,000,000	2785	18%
1913	109,186,000	391	24,685,000	3451	23%

Over the period 1900 to 1913, 19% of the agricultural equipment sold in Russia was sold in Siberia. Yet, Siberia had only 8% of the cultivated land area in Russia.[93] By 1914, Siberia was absorbing almost 25% of all the agricultural equipment manufactured in Russia.[94] And in that same year, Russia sa a whole had to import 63.5 million rubles of the 127.3 million rubles worth of agricultural equipment sold in the country -- almost half.[95] The peasant farmers in Siberia were far ahead of their European Russian counterparts in the purchase of machinery. Siberia had led the way in establishing relations with American suppliers

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[92]Tiukavkin, Sibirskaia Derevnia, p. 328; Appendix Table 5.

[93]Tiukavkin, Sibirskaia Derevnia, p. 328.

[94]Goriushkin, Sibirskoe Krest'ianstvo, p. 114.

[95]Goriushkin, Sibirskoe Krest'ianstvo, p. 113.

of agricultural equipment.[96]

In fact, just before World War I almost half of such equipment sold in Siberia was produced by International Harvester.[97]

The Siberian peasants tended to purchase their equipment in a certain order. Their first purchase usually replaced the wooden plow with an iron one. After that, the most difficult and expensive hand-labor tasks, harvesting and hay-mowing, were mechanized.[98] Between 1898 and 1906, almost a fourth of total machinery sales by value in Siberia involved reaping machines.[99] And in 1914, two thirds of the pieces of equipment sold in Siberia were iron plows many of which had been produced in Western Siberia.[1]

Efforts to transfer production of agricultural equipment to domestic plants were hindered by two major difficulties: lack of necessary technical skill and shortage of the turn-over capital to be able to sell to the peasantry on credit. In 1908, the government had ordered

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[96] Aziatskaia Rossiia, Vol. I, p. 405.

[97] Tiukavkin, Sibirskaia Derevnia, p. 331.

[98] Tiukavkin, Sibirskaia Derevnia, p. 328.

[99] Tiukavkin, Sibirskaia Derevnia, p. 327.

[1] Goriushkin, Sibirskoe Krest'ianstvo, p. 113.

production of plows, seeding machines, and mowing machines transferred from foreign suppliers to Russian manufacturers by imposing import quotas on these items. Reaping, sheafing, and binding machines were more difficult to manufacture and, thus, still had to be imported. Yet, when the Russian firm "Griyevz" approached the State Bank for credits of 1.5 million rubles so that it might manufacture and sell reaping machines on the installment plan, its request was rejected. Hence, foreign reaping machines were able to retain their substantial share of the market.[2] The need for turn-over capital was increased by most peasants' need to buy on credit or not at all. In fact, one half of all agricultural machinery sales in Siberia were made on the installment plan. The most common terms were one third down with two years to pay the balance with an annual interest charge of six to eight per cent.[3] Despite Soviet claims to the contrary, evidence indicates that these terms did not impose unbearable burdens on peasant debtors. In the decade preceding World War I, Siberian peasants as a group in any given year usually owed ten to twelve million rubles to private firms and three to four million rubles to Migration Administration storehouses. Yet between 1911 and 1913,

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[2]Tiukavkin, Sibirskaia Derevnia, p. 334.

[3]Tiukavkin, Sibirskaia Derevnia, p. 327.

only 7,720 cases involving debts went to court and between 1911 and 1914 the storhouses of the Migration Administration repossessed equipment sold on credit in only 23,450 households.[4] In fact, the Revolution freed the Siberian peasantry from repaying 4,187,700 rubles still owed to the Migration Administration alone on agricultural equipment in 1917.[5]

The degree of dependence of the Russian Empire and of Siberia in particular on foreign suppliers of agricultural equipment cannot be fully realized without some figures relating to domestic production of such equipment. Appendix Table 6 provides such figures for 1913, the year of highest production of agricultural equipment since in 1914 plants were being switched to production of military equipment.

The percentage figures in the last row of Appendix Table 6 are of interest. Siberia and the Far East had only 1.5% of agricultural machinery plants in the Empire in 1913; Siberia also produced only 0.2% of the total pieces of agricultural equipment produced in the Empire and 0.1% of the total value of such equipment. These figures are especially striking when one remembers that in 1913 Siberia had eight per cent of the sown area of

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[4]Goriushkin, Sibirskoe Krest'ianstvo, p. 120. This was only 1.7% of the 1,342,500 rural households in Siberia in 1916.

[5]Tiukavkin, Sibirskaia Derevnia, p. 327.

the Russian Empire and was also absorbing twenty-three per cent of the Empire's sales of agricultural equipment. It should also be noted that the figures are for 1913--seventeen years after the opening of the Trans-Siberian Railroad and five years after the great Siberian migration had reached its peak. If an agricultural machinery industry were going to develop in Siberia, it had already had ample time in which to do so. The absence of Irkutsk and Yeniseysk gubernias in the list of districts in the table is rather conspicuous. The entire area officially known as Eastern Siberia as late as 1913 was without a single factory for the production of agricultural machinery.

This completes our survey of the role of the Tsarist government in the supply and distribution of agricultural capital goods in Siberia. The points to be especially noted are the tremendous growth of the market for agricultural equipment, the vital role in opening that market played by the State storehouses, the dependence of Siberia on imports of agricultural capital both from European Russia and foreign countries, and the apparent availability of such capital through credit sales. The provision of agricultural capital was evidently one area in which government efforts were both beneficial and quite effective. It may be significant that this also was one area in which the government was content to lead the way and to regulate

private enterprise through the market mechanism (by providing competitive outlets) rather than to supervise the entire agricultural capital distribution system through a chain of command originating in Petersburg.

C. Government Technical Assistance

The technical assistance supplied by the government to Siberian agriculturalists before the Revolution was so insignificant as to be hardly noticeable. Siberia had one university founded in 1880 and opened in Tomsk in 1888. In addition, three lower agricultural schools were organized in 1887; their number eventually increased to thirteen. A middle-level agricultural school was founded in 1912, but no high-level agricultural institute was ever established. The first agricultural machine-testing station was not started until 1910 in Omsk.[6] Thus few Siberians could receive training in agronomic science without going to European Russia. This made Siberia largely dependent on non-Siberians, whose training and experience had been acquired outside Siberia, for agricultural technical assistance.

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[6]E.E. Geshele, Ocherki Razvitiia Sibirskogo Zemledeliia (Essays on the Development of Siberian Agriculture), (Omsk, 1957), p. 61.

Government agronomists first appeared in Siberia between 1894 and 1896.[7] The Migration Administration established the Migration Agronomic Organization in 1908;[8] it was transferred to the Ministry of Agriculture in 1909.[9] A Cossack agronomic organization was founded in 1912.[10] Agronomic aid in Siberia consisted largely of operating seed-cleaning stations, maintaining demonstration and experimental plots, teaching animal husbandry and use of equipment,and organizing cooperatives.[11] Although this aid was highly diversified, it was woefully inadequate for Siberia's needs. For example, on the eve of World War I, Western Siberia had only two experimental fields--one established at Omsk in 1904 and the other at Kirensk in 1913. Also in 1913, the agronomic personnel employed in all of Akmolinsk oblast' totalled 32.[12]

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[7] Istoriia Sibiri s Drevnieshikh Vremen do Nashikh Dnei, Vol. III, p. 201.

[8] Goriushkin, Sibirskoe Krestianstvo, p. 177.

[9] Tiukavkin, Sibirskaia Derevnia, p. 314.

[10] Goriushkin, Sibirskoe Krestianstvo, p. 177.

[11] Goriushkin, Sibirskoe Krestianstvo, p. 177.

[12] Goriushkin, Sibirskoe Krestianstvo, p. 177.

Disease was rampant among Siberian livestock, yet Western Siberia in 1913 had only one veterinarian for every 125,000 animals; the figure for Eastern Siberia was even lower.[13]

Technical assistance supplied by the government to Siberian agriculturalists and livestock breeders was extremely limited and had little apparent effect on the development of Siberian agriculture before the Revolution.

D. Summary of Government Role in the Agricultural Development of Siberia

Chapters VII and VIII have reviewed the role of the Tsarist government in the agricultural development of Siberia. For convenience, those policies were divided into two categories--general policies which affected agriculture and specific policies which dealt directly with agricultural development.

Most of these policies and projects of the Tsarist government had a positive effect on the development of Siberian agriculture. The construction of the Trans-Siberian Railway was absolutely necessary to the growth of agriculture in the region. It reduced transport costs by some 80% and provided communication between Siberia and markets in European Russia and beyond. Government

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[13]Goriushkin, Sibirskoe Krest'ianstvo, p. 186.

policies relating to migration were also largely beneficial to agricultural development. Government loans and tax exemptions for new-settlers, although not crucial, were important in helping some marginal new households to sruvive. The five-year draft exemption for new-settlers and the provision of free allotments from the immigrant land fund were extremely important for rapid and successful settlement of new migrants and, therefore, for expansion of agriculture. Also of great importance for the expansion of agriculture was the opening up of Siberia to the importation and sale of agricultural equipment. This was accomplished largely through the retail outlets and credit provided by the Migration Administration. Even two otherwise unsavory po cies had favorable effects on agricultural development. (1) The exile system provided settlers for otherwise neglected areas of Siberia and increased the size of the agricultural proletariat in the tight Siberian agricultural labor market. (2) The requisition of native lands for the immigrant land fund forced the native tribes of Siberia to give up their nomadic ways, settle down, and adopt agriculture if they were to survive.

Other policies of the Tsarist government relating to Siberian agricultural development were largely ineffective. Government attempts to control the movement of peasants both to and within Siberia met with little success. The

Stolypin land reform also met with little success in Siberia. Both these policies failed largely because they contradicted the wishes of the peasantry. Even the collection of direct taxes from the Siberian peasantry was not completely successful since the government could not keep track of all the peasants in the vast expanses of Siberia. On the other hand, government technical assistance to agriculture was largely ineffective not because the peasants chose to ignore it but because the assistance offered was not on a sufficiently large scale to be effective. There was also the problem that most trained agronomists had to be imported into Siberia from other parts of Russia, so they were largely unfamiliar with the special conditions affecting agricultural activity in Siberia.

There were only two government policies which definitely inhibited Siberian agricultural development. The first was the 40.5 acres per male norm and the shaving of old-settler allotments which accompanied the attempted imposition of this norm. The practical results of this policy were uncertainty within the peasant land tenure system and serious abuse of the State's right of eminent domain as good peasant land wound up permanently in State or Kabinet holdings. On the other hand, this policy was a means of stocking the immigrant land fund. The aim of

transferring little used old-settler land into the immigrant land fund was certainly not antithetical to Siberian agricultural development, but the rigidity of the 40.5 acres (or less) per male norm and the abuses and uncertainty which accompanied the transfer sometimes crippled old-settler and native agricultural activity. On the other hand, the Cheliabinsk freight rate barrier against the export of Siberian grain to European Russia, which was not completely removed until 1913, was intended from the beginning to dampen the competition of Siberian grain exports with the grain produced on the estates of the big landowners of European Russia. It is the only instance in which the government responded to pressure to hinder the agricultural growth of the region. Nor should its importance for Siberian agriculture as a whole be exaggerated. In 1913, wheat comprised only 23% of Siberian agricultural exports.[14]

Tsarist government policies in general were beneficial or ineffective in their effects on the agricultural development of Siberia.

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[14]See Table III.1 in Chapter III.

Appendix to Chapter VIII

Table 1: Status of Settlement of Immigrant Parcels on January 1, 1916

Status of Parcels	Tobolsk	Tomsk	Yeniseysk
I. Prepared for Communal Use	205,414	461,512	246,333
Of These Left Unoccupied	38,764	29,684	73,585
% Unoccupied	18.8	6.4	29.8
Of these:			
a) Unsuitable for Occupation (%)	27,969 (72.1)	14,864 (50,0)	54,510 (74.0)
b) Suitable for Occupation (%)	10,795 (27.9)	14,820 (50.0)	19,075 (26.0)
II. Prepared for Individual Use	2,871	4,201	1,296
Of These Left Unoccupied	811	1,795	776
% Unoccupied	28.2	42.7	59.8
Of these:			
a) Unsuitable for Occupation (%)	494 (60.9)	1,313 (73.1)	406 (52.3)
b) Suitable for Occupation (%)	317 (39.1)	482 (26.9)	370 (47.7)

(Continued)

(Table 1 Continued)

Status of Parcels	Irkutsk	4 Gubernias	All Immigrant Districts Except Amur Oblast'
I. Prepared for Communal Use	138,850	1,052,109	2,019,291
Of These Left Unoccupied	70,999	213,032	429,325
% Unoccupied	51.1	20.2	21.2
Of these:			
a) Unsuitable for Occupation (%)	30,955 (43.5)	128,298 (60.2)	239,656 (55.8)
b) Suitable for Occupation (%)	40,014 (56.5)	84,734 (39.8)	189,669 (44.2)
II. Prepared for Individual Use	1,741	10,109	42,128
Of These Left Unoccupied	1,219	4,601	21,178
% Unoccupied	70.0	45.5	50.2
Of these:			
a) Unsuitable for Occupation (%)	220 (18.0)	2,433 (52.8)	2,760 (13.3)
b) Suitable for Occupation (%)	999 (82.0)	2,168 (47.2)	18,418 (86.7)

Source: L.F. Skliarov, Pereselenie i Zemleustroistvo v Sibiri v Gody Stolypinskoi Agrarnoi Reformy, (Leningrad, 1962), p. 329.

Data on Obrok Articles

By 1910 throughout the Russian Empire, there had been issued 26,600 state-obrok articles covering a total of 19.7 million acres with an annual income of 9.3 million rubles. Of this area, 10.5 million acres were in European Russia and 7,665,300 acres covered by 36% of all obrok articles were in Siberia. Of this area, 4,406,400 acres were in Tobolsk gubernia; 2,948,400 acres in Tomsk gubernia; 186,300 in Yeniseysk gubernia; 59,400 acres in Irkutsk gubernia; and 64,800 acres in Zabaikal oblast. Over 90% of Siberian state-obrok articles were in Western Siberia. In Tobolsk gubernia, nearly 12% of peasant land was under state-obrok articles; in Tomsk gubernia, nearly 20%.[1]

Despite their required contributions to the immigrant land fund, both the State Treasury and the Kabinet increased the area of land they rented. In the fertile Altai district, the Kabinet rented out 1,209,060 acres in 1910; 1,941,300 acres in 1912; and over 2,700,000 acres in 1915.[2] State and Kabinet obrok articles in Tomsk and Tobolsk gubernias together had covered 5,100,300 acres in 1895; by 1915, they covered 7,659,900 acres. In Yeniseysk gubernia, the area under state-obrok articles had been only 135,000 acres in

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[1]V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria, (Novosibirsk, 1966), p. 115.

[2]Tiukavkin, Sibirskaia Derevnia, p. 106.

1895; by 1915, it had increased 9-fold to 1,236,600 acres.[3]

The general trend of state-obrok rent rates was a steadily rising one over time, but rates remained much lower in Siberia than in the more densely populated districts of European Russia. For example, in Tyumen okrug around 1885 there were issued 17 land-obrok articles covering 51,300 acres and 9 on fishing areas covering some 2,700 acres. The average annual income on these articles was only about 2.6 kopeks per acre. Yet rents had approximately doubled in the previous 12 years.[4]

In 1910, the average income from 1 acre under state-obrok articles was only 3.3 kopeks in Siberia; in the Baltic provinces, it was 1 ruble, 33 kopeks; and in the southern gubernias of European Russia, 1.48 to 1.85 rubles. In Tobolsk gubernia, the average was only 4.9 kopeks; in Tomsk, 2.8 kopeks; and in Yeniseysk, 9.1 kopeks. The figures are so low for Siberia because even in 1910 many parcels covered by articles were not rented at all.[5]

Rental prices for State lands also varied greatly in relation to the term of rental. For example, in Irkutsk

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[3]Tiukavkin, Sibirskaia Derevnia, p. 115.

[4]L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p. 85-86.

[5]Tiukavkin, Sibirskaia Derevnia, p. 104.

gubernia in 1911, good state-obrok land could be rented for a long term at only 14.9 kopeks per acre; but rental for only 1 year ran as high as 49 kopeks per acre. In Zabaikal oblast', long term rental was only 4.0 kopeks per acre, but for 1 year it almost doubled to 7.5 kopeks per acre.[6] These prices seem extremely low because they include marginal land good only for grazing or other extensive uses. Average State rental prices across Siberia for the rental of 1 acre for 1 year in 1912 were recorded as the following: virgin plowland, 2 rubles, 93 kopeks; softened plowland, 1 ruble, 12 kopeks; prime hayfields, 40 kopeks.[7] This works out to an average of 43 kopeks for an acre of good agricultural land. By comparison, in European Russia the average rent charged land-poor peasants under specially favored conditions was 1 ruble, 7 kopeks.[8]

State land was also supposedly rented to wealthy kulaks on privileged terms. In 1913, such special rates averaged 19 kopeks per acre in Tobolsk gubernia, 26 kopeks per acre in Akmolinsk oblast', and 43 kopeks per acre in Turgai

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[6]Tiukavkin, Sibirskaia Derevnia, p. 104.

[7]V.K. Kuznetsov, Sbornik Statisticheskikh Svedenii ob Ekonomicheskom Polozhenii Pereselentsev v Sibiri (Collection of Statistical Information About the Economic Position of Migrants in Siberia), (Petersburg, 1912), Part I, p. 128.

[8]Tiukavkin, Sibirskaia Derevnia, p. 105.

oblast'.[9] In comparison with the rates mentioned in the preceding paragraphs, these terms do not seem especially low. Sklyarov also notes and condemns the fact that huge parcels were rented to kulaks and big livestock breeders while land-poor old-settlers and immigrants were having their allotments shaved.[10] Yet in 1914, there were across all Siberia only 315,900 acres of State (not Kabinet) land rented for long term cattle-raising at an average rate of 6 kopeks per year per acre.[11] This is a"drop in the bucket" by Siberian standards.

The following tables are presented not for careful analysis but only to give a reasonable suggestion of the size and origin of revenues from the rental of State property in Siberia. The first table gives in rubles the sources of revenue from state-obrok articles for Tobolsk gubernia in 1911. Tobolsk was the largest of Siberia's 4 gubernias both in terms of population and of agricultural area worked. It should also be not too dissimilar to other areas as far as renting of State land is concerned.

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[9]L.F. Skliarov, Pereselenie i Zemleustroistvo v Sibiri v Gody Stolypinskoi Agrarnoi Reformy (Migration and Land-Use Structure in the Years of the Stolypin Agrarian Reform), (Leningrad, 1962), p. 346.

[10]Skliarov, p. 347.

[11]Istoriia Sibiri s Drevneishikh Vremen do Nashikh Dnei Vol. III, Sibir' v Epokhu Kapitalizma (History of Siberia from Ancient Times to Our Days, Vol. III, Siberia in the Epoch of Capitalism), (Leningrad, 1968-1969), p. 317.

Table 2: Revenue From State-*Obrok* Articles in Tobolsk *Gubernia* in 1911 in Rubles

	Village Societies	Peasant Cooperatives	Individual Peasants	Individuals of Other Classes
Acres Rented by This Group	1,207,526	286,084	2,261,404	111,899
Arrears of Past Years	8,445*	3,284	12,087	985
Total Payments Due for 1911	65,861	22,986	86,667	13,284
Paid Over 1911:				
a) arrears	9,988*	2,005	7,583	487
b) for 1911 rent	58,764	19,458	82,687	11,936
Not Paid by January 1, 1912:				
a) arrears	4,457*	1,279	4,504	498
b) for 1911 rnet	7,097	3,528	3,980	1,348

(*Footnote: These figures are inconsistent. I suspect that "arrears of past years" should read 14,445 rather than 8,445.)

Source: L.M. Goruishkin, *Sibirskoe Krestianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX*, (Novosibirsk, 1967), 395.

The most obvious fact to be read from this table is the predominance of individual peasants in the renting of land under state-*obrok* articles. Village societies (mostly communes) rented only about half as much while peasant cooperatives and non-peasant individuals were of much less importance. Simple calculations from the table further reveal

that village societies paid on the average 6 kopeks per acre rented; peasant cooperatives paid 8 kopeks per acre; individual peasants, only 4 kopeks per acre; and non-peasant individuals 12 kopeks per acre. This would seem to indicate some preferential treatment for individual (kulak?) peasants in rental rates for State land. But no such conclusion can safely be drawn since no information is available concerning the wealth positions of the individual peasants concerned. There is also the possibility that the rates varied largely due to biases in each group toward the renting of certain types of land. For example, since peasant cooperatives were usually involved in the butter industry, they may have tended to rent mostly lush meadows suitable for milk cows.

The table given below records the income from obrok articles and forest parcels of Tomsk uezd in 1916. It gives some indication of the relative importance and variety of the economic uses of State land in Siberia.

Table 3: State Treasury Income from Obrok Articles of Tomsk Uezd in 1916

Source of Income	Number of Obrok Articles	Area Covered in Acres	Annual Obrok in Rubles
Obrok Articles:			
a) land	177	203,607	4,289
b) non-land	17	194	3,343
Forest Parcels:			
a) for forage and fodder	-	-	11,440

(Continued)

(Table 3 Continued)

Source of Income	Number of Obrok Articles	Area Covered in Acres	Annual Obrok in Rubles
b) for fishing	-	-	5,081
c) for nut gathering	-	-	3,768
d) for bee-keeping	-	-	227
e) for hunting	-	-	105
Total	194	203,801	28,251

Source: V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria, (Novosibirsk, 1966), p. 107.

Note the predominance of the forest parcels. In fact, in 1916 Tomsk gubernia collected 240,000 rubles from obrok articles and 687,100 rubles from use of its forest parcels.[12]

[12] Tiukavkin, Sibirskaia Derevnia, p. 108.

Table 4: Value of Goods (Machinery, Spare Parts, Materials, Etc.) Sold by Agricultural Supply Outlets of the Migration Administration in Rubles

Year	Goods Sold for Cash	Payments Received for Sales on Credit	Debt Outstanding on Year's Credit Sales	Total Sales
1898	154,103	8,685	49,083	211,871
1899	340,510	39,944	144,710	525,164
1900	396,295	80,925	240,959	718,179
1901	479,220	81,440	199,802	760,462
1902	963,544	178,833	474,199	1,616,576
1903	568,834	363,247	670,084	1,691,418
1904	366,753	258,515	584,034	1,209,302
1905	560,834	574,672	1,457,080	2,592,586
1906	774,535	656,548	1,136,078	2,567,161
1907	1,394,532	1,201,703	1,989,947	4,586,182
1908	1,698,907	1,346,908	2,130,089	5,175,904
1909	1,282,917	1,139,168	2,181,523	4,603,608
1910	1,037,653	1,126,062	2,808,684	4,972,399
1911	1,024,852	1,218,727	4,554,484	6,798,063
1912	1,792,120	1,892,129	4,753,720	8,437,969
1913	2,057,069	1,450,004	3,714,024	7,221,097
1914	2,289,321	1,428,465	4,601,147	8,318,933
1915	3,211,111	643,906	2,133,604	5,988,621
1916	4,990,167	457,222	4,187,722	9,635,111

Source: L.M. Goriushkin, Sibirskoe Krestianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p. 393.

Table 5: Value in Rubles of Agricultural Equipment Sold in Siberia by the Migration Administration and Private Dealers

Year	Total Sales	Migration Administration Sales	Sales of Private Dealers (2-3)	Share of Migration Administration in Total Sales
1898	211,871	211,871	0	100%
1899	525,164	525,164	0	100
1900	718,179	718,179	0	100
1901	760,462	760,462	0	100
1902-1905	13,000,000	7,109,882	5,890,118	55
1906	7,000,000	2,562,161	4,437,839	37
1907	13,000,000	4,586,182	8,413,818	35
1908	15,000,000	5,175,904	9,824,096	34
1909	14,000,000	4,603,608	9,396,392	33
1910	15,000,000	4,972,399	10,027,601	33
1911	20,000,000*	6,798,063	13,201,937	34
1912	21,000,000*	8,437,969	12,562,031	40
1913	24,685,000*	7,221,097	17,463,903	29
1914	14,659,000*	8,318,933	6,340,067	56

(*Footnote: The Migration Administration itself estimated agricultural equipment imports into Siberia at 18,042,000 rubles in 1911 and 19,419,000 rubles in 1912. The figures given for 1913 and 1914 are such estimates of agricultural equipment imports into Siberia, not total sales.)

Source: Table 4 above and L.M. Goriushkin, Sibirskoe Krestianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p. 114, 393.

Table 6: Production of Agricultural Machinery and Implements in Russia and Various REgions in 1913

Region of the Country	Number of Plants	Total Number of Pieces Produced	Total Value of Production in Rubles
Russian Empire	981	10,319,187	60,508,235
European Russia	770	9,154,044	54,885,065
Akmolinsk Oblast'	1	17,554	364,010
Tobolsk Gubernia	5	4,540	136,853
Tomsk Gubernia	3	2,786	26,970
Amur Oblast'	3	60	18,000
Primorsky Oblast'	3	491	31,460
Total for Siberia and Far East	15	25,431	577,293
Per Cent of Empire Total in Siberia and Far East*	1.5%	0.2%	0.1%

(*Footnote: Computed by me.)

Source: Sbornik Statistiko-Ekonomicheskikh Svedenii po Selskomu Khoziaistvu Rossii i Inostrannikh Gosudarstv, Vol. X, (Petersburg, 1916), p. 632, 634, 635.

This completes our survey of the role of the Tsarist government in the supply and distribution of agricultural capital goods in Siberia. The points to be especially noted are the tremendous growth of the market for agricultural equipment, the vital role in opening that market played by the State storehouses, the dependence of Siberia on imports of agricultural capital both from European Russia and foreign countries, and the apparent availability of such capital through credit sales. The provision of agricultural capital was evidently one area in which government efforts were both beneficial and quite effective. It may be significant that this also was one area in which the government was content to lead the way and to regulate private enterprise through the market mechanism (by providing competitive outlets) rather than to supervise the entire agricultural capital distribution system through a chain of command originating in Petersburg.

Chapter IX: Market-Related Factors Affecting the Development of Siberian Agriculture

A. Introduction

Chapters VII and VIII above have already discussed government policies and their effects on the agricultural development of Siberia. In this chapter we turn to those factors affecting Siberian agricultural development which became effective in response to a profit-making opportunity, that is, market-related factors. Our study of the role of private enterprise will be confined to peasant enterprise, however, since non-peasant private enterprise was of relatively minor importance. Non-peasants played a direct role in agricultural development in only three ways: as general middle-men and merchants, as importers and distributors of agricultural equipment,[1] and as exporters of Siberian butter.[2] Almost all other private enterprise relating to agricultural development was peasant enterprise. The following facets of peasant enterprise will be discussed below: the role of the mir or peasant commune, peasant land

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[1]As discussed in Chapter VIII, Section B above, they followed the lead of the Migration Administration.

[2]To be discussed in Section G below. The role of industries related to agriculture such as equipment manufacturing, flour milling, and tanning will not be covered.

allocation, the market for agricultural labor, the peasant demand for agricultural machinery, peasant systems of field use and crop rotation, peasant response to marketing opportunities and requirements--especially for butter, and the rewards of response to economic opportunity--peasant income and wealth. An evaluation of peasant response to economic opportunities in Siberian agriculture will also be included.

B. The Mir

The Siberian peasantry responded both to economic opportunity and political necessity in part with the mir or peasant "commune." The **mir**, at least in Siberia, was a highly flexible social institution responsive to the needs of its members. Up to the late nineteenth century, the average mir in Siberia had usually covered several villages or even an entire volost and had functioned largely as tax-collector for the government. However, as more migrants settled in Siberia, some areas became more crowded and certain types of land became scarce. Villages within large volost'-communes engaged in land disputes among themselves. The volost'-communes were too large to perform functions which required close communication between villages since these villages could be many miles apart. As a result, they broke down into more natural village-communes which then presented inter-village land disputes to the volost' courts

for settlement. These village-communes averaged about 533 members of both sexes and all ages.[3]

The Siberian village-commune with its close communication among its members developed to perform the following five functions to varying degrees. (1) It retained its role as allocator of the burden of taxes imposed by the various levels of government and also levied taxes and obligations on its own to satisfy local needs. (2) As certain types of land or other natural factors such as water became scarce, these factors were placed in common ownership under the mir with the mir allocating use of the scarce factor among its members. It is notable that the Siberian peasantry turned to common ownership and the mir to allocate scarce natural factors rather than private ownership and a market allocation system. (3) The mir also acted as a kind of mutual insurance organization with the members helping each other out in cases of individual misfortune. (4) Another function of the mir was to act as a buffer between the bureaucracy of the Tsarist government and the individual and otherwise defenseless peasant. The

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[3]This estimate is based on a total of 11,235 settlements in Siberia in 1906 reported in N.P. Oganovsky, compiler, Sel'skoe Khoziaistvo Rossii v XX Veke (The Rural Economy of Russia in the Twentieth Century), (Moscow, 1923), p. 14 and the estimate of total rural population in Siberia reported in Table III.10 of Chapter III. There is always the possibility that some smaller settlements may have been missed.

settled Siberian peasant seldom came into direct contact with government officials; rather, he was represented by his mir in all his relations with the government. This function may not seem very important, but one should remember that the peasant was almost always illiterate and unaware of his rights--if any. It was also not uncommon for a peasant to be subjected to physical abuse if he failed to comply with an official's orders. (5) A fifth function of the mir in Siberia was to provide a basis for the formation of producer and consumer cooperatives. This function was especially important for the growth of the Siberian butter industry. The flexibility of the mir as a social institution allowed the Siberian peasantry to accomplish these five tasks easily and to whatever degree desired by the members of each mir. Some of these five functions have already been mentioned in Chapter VI, Section B above in a discussion of the mir as part of the social environment in which Siberian agricultural development took place. They are repeated here to emphasize that the Siberian peasantry took full advantage of these potential services. It should also be noted that the Siberian mir was extremely resilient and survived even Stolypin's land reform, as shown in Chapter VIII, Section A above.

C. The Peasant Land Tenure and Allocation System

The peasant land tenure system in Siberia is an excellent example of peasant response to need. The Tsarist government with its simple claim that all land belonged to the State or to the Tsar's household failed to provide any kind of allocation system for agricultural land. The peasantry had to solve this problem on their own if they were to pursue agricultural activity. They solved the problem both through the authority of the mir and by ignoring the law. The peasants of Siberia bought, sold, inherited and bequeathed the property of the State and of the Tsar's household in Siberia with impunity. Their system of land ownership existed outside the law and was not seriously challenged by the government until surveying for the immigrant land fund was intensified at the turn of the century. The limited role of the Tsarist government in land allocation in Siberia has already been discussed in Chapter VIII, Section A above. In the following paragraphs, we shall examine the means of solving the land allocation problem developed by a largely illiterate peasantry not only outside the law but in direct opposition to it.

While the land policies of the State bore the marks of bureaucratic rigidity and frequent irrelevance up to 1904, the land allocation system within the commune seems to have been a model of flexibility and responsiveness to the realities of agricultural productive relations.

The evolution of the land tenure system within the commune was basically a response to the growing scarcity and therefore increasing economic value of agricultural land. The commune also changed in size. In the middle of the 19th century, the commune usually covered an entire volost' and encompassed a number of villages; separate villages often used exceptionally good or convenient grazing or even plowland in common. The increasing scarcity of land led to disputes over its use between separate villages of the same commune. The volost'-commune was then broken down into a number of village-communes, which turned to the volost' courts to settle their disputes.

The land-holding practices within a typical village-commune of Siberia evolved in the following way. In the first stage in which land was most plentiful, it could be claimed simply by seizure. A man owned whatever fields he plowed and sowed and whatever pastures in which his cows were grazing. When he abandoned the field or moved his cows, he relinquished ownership and the field or pasture could be claimed by another.[4] As land became a scarcer factor, this system led to impoverishment of the soil. Fields were claimed by another as soon as they

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[4] L.F. Skliarov, Pereselenie i Zemleustroistvo v Sibiri v Gody Stolypinskoi Agrarnoi Reformy (Migration and Land-Use Structure in the Years of the Stolypin Agrarian Reform), (Leningrad, 1962), p. 299.

were abandoned and not allowed to lie fallow and replenish themselves. A more continuous ownership would guarantee a fallow period. In many communes, then, a field remained a man's property for about two years after he abandoned it. This period was extended to perpetuity and even to a right of bequest, inheritance, and sale in some places in the last half of the nineteenth century. Many old-settlers plowed the same fields as did their great-grandfathers a hundred years earlier.[5]

As land continued to become more scarce, the right of land ownership by simple seizure had to be restricted. There was, however, no general pattern to these restrictions. Each commune restricted the right of seizure only on those types of land on which such restriction was required. Thus, a commune with plentiful hayfields but little good plowland would restrict only the seizure of plowland; a commune next-door with opposite relative scarcities of these land types would restrict only the seizure of hayfields.[6]

The practices instituted to restrict the right of seizure were often ingenious in their ability to defuse an

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[5] Aziatskaia Rossiia, Vol. II, Zemlia i Khoziaistvo (Asiatic Russia, Vol. II, Land and Economy), (Petersburg, 1914), p. 559.

[6] Why didn't the villages simply trade land amongst themselves? They did, especially when the villages were part of a volost'-commune and where trade was feasible. However, a village was quite likely to suffer the same land-type relative scarcities as its neighbors due to the monotonous geography of Siberia. Also, villages were often 80 to 100 kilometers apart and trading of fields might involve travelling great distances to work them.

otherwise dangerous situation. (Free use of land had come to be considered a virtual birth-right.) Restrictions on land-use were turned into games. One example was the custom of "zakos." On a single appointed day, the head of each household mounted his horse and galloped off (or ran pulling it behind him) at the crack of dawn to the village hayfields. There he ran his horse around in a circle beating down a border around a part of the field which would be his property by right of seizure for three days. He and his family then mowed as much hay as they could over the three days. At the end of this period, his neighbors were free to take any hay which had not been mowed.[7] This annual game allocated hay to those households which most needed it--those with the fastest (and therefore, healthiest) horses and the largest numbers of working members.

The final step in the evolution of the commune land-tenure system was the revocation of the right to own "excess" land and the redistribution of that land to more needy households. Even at this stage the Siberian commune retained its individuality. The mechanisms for allotting land which came up for redistribution were various: to that household with the most males; to that household which has the least land of the given sort per member; to that household with

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[7] Aziatskaia Rossiia, Vol. II, p. 557.

the most horses and/or workers.[8] These practices distinguish the Siberian village-commune from the European Russian commune in which equal shares per male soul of working age was the general practice. Also, the Siberian commune redistributed land to relieve gross inequities and hardship but not to enforce true equality of land use. It seldom interfered with long-established use of a parcel by the same family.

The last land type to be subjected to redistribution was usually plowland. This may seem surprising since it is usually the most important type for a peasant and composes the major part of his total holding. One must remember, however, that the right of seizure necessitated use, and use of plowland requires more labor per unit area than any other land type; therefore, the commune seldom found members suing "excess" plowland that they could not properly work.

It is not possible to mark the exact time and place of the various stages in the evolution of the land tenure system within the Siberian commune; nevertheless, some vague generalities may be illuminating. The right of the commune to redistribute land had been asserted as far back as the first half of the 19th century. The commercial raising of livestock had put a premium on good meadows

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[8] V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria (The Siberian Village on the Eve of October), (Novosibirsk, 1966), p. 92.

and hayfields which were required to maintain the stock over the long winters. By the middle of the 19th century, meadows and hayfields were already being redistributed in the majority of Siberia's commercial livestock-raising localities. Only forest and plowlands had retained use by right of seizure, but toward the end of the 19th century even they were being redivided to a considerable degree. Limitation of use of these land types appeared first in the more densely populated districts of Western Siberia, especially the central districts of Tobolsk gubernia and the Altai okrug and only later in scattered districts of much less densely populated Eastern Siberia.[9] It should be noted that most of these redivisions did not involve equalization of land-holdings per person; however, even this practice had appeared in Tobolsk gubernia in the 1860's and 1870's.[10] and was prevalent in the southern districts of Tomsk and Tobolsk gubernias among new communes formed entirely of immigrants from European Russia.[11] Equalization of land area per male soul up to the 1890's was confined to certain types of land even in most densely populated Tobolsk gubernia. There was no village that redistributed land to achieve equal holdings of all land types per male

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[9] Istoriia Sibiri s Drevneishikh Vremen do Nashikh Dnei, Vol. III, Sibir'v Epokhu Kapitalizma (History of Siberia from Ancient Times to Our Days, Vol. III, Siberia in the Epoch of Capitalism), (Leningrad, 1968-1969), p. 35.

[10] Skliarov, p. 293.

[11] Skliarov, p. 255.

member.[12]

A system of land rentals among peasants also developed through peasant custom. However, some rents were, in effect, payments for services rendered. Cleared land in forest areas brought rent even though other types of land could be worked by simple seizure. The "utuga" of Southeastern Siberia, a heavily manured and usually irrigated meadow, was rented to big cattle-owners even in the first half of the 19th century. Peasant custom dictated that one could seize unoccupied land, but one could not seize the fruits of another's labor. As the right of seizure was further limited, the right of ownership was extended and the practice of renting land expanded along with it. The fact that peasant land practices were rooted in right of ownership based on seizure and long usage may explain to some degree why land in Siberia was rented for much shorter terms than in European Russia. A peasant who rented a parcel for a long period might by custom eventually be granted ownership of that parcel or at least the right to its continued use at the same rate of payment.

Table 1 in the Appendix gives the percentages of rented agricultural land provided or used by the following groups in 1913: old-settlers, new-settlers, the Kirghiz tribe, Cossacks and other persons, and the State. The most striking fact in Appendix Table 1 is the predominance of old-settlers both in providing and using land for rent. Old-settlers

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[12]Skliarov, p. 300.

provided between 57% and 63% of the rented land in Tomsk, Yeni Yeniseysk, and Irkutsk gubernias and used 45% and 86% of the rented land in Yeniseysk and Irkutsk gubernias respectively. Yet old-settlers were only about 46% of all the peasants in Siberia.[13] The State did not play a role commensurate with its land holdings. Nor were new-settlers important suppliers of rented land except in Yeniseysk and Irkutsk gubernias; they were important users of rented land only in Yeniseysk gubernia. The predominance of old-settlers as both providers and users of rented land may be easily explained. First, they were by definition the longest settled peasant group in Siberia. Second, the land resturcturing activity of the government had broken up many large holdings and threatened to hold communes to a norm of 40.5 acres per male or less. This activity was a powerful force in favor of greater equality of land area per household. There was, however, no effort to equalize peasant property in the form of livestock, labor power, or agricultural equipment. This fact favored the direction of land rental from smaller, less well-equipped households to prosperous old-settlers with more ambition and agricultural capital than the 40.5 acre norm could make use of. For example, in Tomsk gubernia around 1910, 62% of the rented land was used by

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[13]Estimate based on figures in Tables III.10 and VI.1.

large households with an average sown area of 40.5 acres, 5 or 6 working horses and 5 or 6 cows.[14] In Eastern Siberia, poor immigrants used an average of 2.2 acres of rented arable land and 7.8 acres of rented hayfields per household. Wealthy peasant households, on the other hand, rented and used on the average 11.6 acres of arable land and 25.6 acres of hayfields. The Siberian immigrant on the average worked 0.3 acres of rented plowland and 0.3 acres of rented hayfields, but the well-to-do old-settler household averaged 4.6 acres of rented plowland and 16.7 acres of rented hayfields.[15]

Tables 2 and 3 in the Appendix summarize rental relations between households grouped by sown area in old-settler and immigrant villages respectively. The table on old-settlers applies only to Tomsk gubernia for the years 1912 and 1913, but their data are typical for the rest of Siberia. Table 3 on immigrants also refers to 1912 and 1913 but concerns immigrant households of Tobolsk, Yeniseysk, and Irkutsk gubernias and two uezds of Akmolinsk oblast'. The figures are for arable and hayfields together, not for sown area.

The tables for both the old-settler and immigrant groups reinforce the conclusion that rented land was more important to the large-scale farmer than to the small-scale farmer

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[14] Istoriia Sibiri s Drevneishikh Vremen do Nashikh Dnei, Vol. III, p. 200.

[15] Tiukavkin, Sibirskaia Derevnia, p. 110.

sowing only a few acres. This conclusion is quite obvious: big planters use more land and if their allotment is fixed by law, they must obtain the use of more land by renting from their neighbors who plant less than they might on their allotments. This may be simple enough for a Western economic historian, but his Soviet counterpart has had a difficult time with this phenomenon. Soviet scholars usually insist that the peasants of Siberia were just as subject to economic exploitation as their brothers across the Urals--the only difference being that the pomeschik or landowner of European Russia was replaced by the kulak and well-to-do peasant. After the abolition of serfdom in European Russia, the pomeschik is said to have retained his role as exploiter through his ownership of agricultural land. His Siberian counterpart, the kulak, should do the same. But the figures indicate that the Siberian kulak usually rented land from his poorer neighbors, not the other way around. This meant that the exploiter rented land owned by the exploited. This is the conclusion drawn as uncomfortable to the Soviet Marxist as it may be.

Now that we have discussed who rented agricultural land, the next topic should be the terms on which this land was rented. This is a complex question since agricultural land in Siberia could be rented for long or short terms, for money, labor services, or a share in the harvest, and at prices varying with the method and time of payment.

Unlike the central gubernias of European Russia, very little land was rented for labor services. Only the kulak could really make use of these services. In 1914, 88% of the land rented in Siberia was rented for money.[16] The table given below, taken from a study by Kuznetsov is probably the best summary of land rental prices in Siberia for the period.

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[16]Tiukavkin, Sibirskaia Derevnia, p. 112.

Table IX.1: Prices in Rubles for the Rental on One Acre of Agricultural Land for One Year in Siberia[17]

Land Type	Steppe Region	West Siberian Wooded Steppe	East Siberian Wooded Steppe	Taiga
Virgin Plowland:				
For Money	1.13	0.88	0.52	-
For Work	2.57	2.55	1.85	-
Softened Plowland:				
For Money	1.38	0.76	1.57	1.35
For Share	1.19	1.38	-	-
For Work	2.14	1.44	2.07	2.09
Hayfields:				
For Money	0.25	0.64	0.35	0.57
For Share	0.54	0.53	0.41	0.56
For Work	0.58	0.44	0.42	0.80

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[17] V.K. Kuznetsov, Sbornik Statisticheskikh Svedenii ob Ekonomicheskom Polozhenii Pereselentsev v Sibiri, (Collection of Statistical Information About the Economic Position of Migrants in Siberia), (Petersburg, 1912), p. 125.

A few preliminary comments are in order here. First, the figures given are averages over extremely large areas with highly diverse economic conditions, so the rents within each region have a high variance. Second, the regions were composed of various uezds of Siberia which matched the given geographical description at that time. Thus, the steppe region was composed of Akmolinsk uezd and parts of Achinsk uezd. The West Siberian wooded steppe included Omsk and Tiukalinsk uezds. The East Siberian wooded steppe was represented by parts of Achinsk uezd and Krasnoyarsk, Kansk, Nizhniudinsk, and Balagansk uezds. The taiga was represented by Tarsk, Turinsk, and Verholensk uezds.[18]

The first thing one notices in the above table is the preferential rate given for cash payment. Only for softened plowland (which has already been worked and, thus, is easier to plow) in the steppe and for hay-mowing fields in the West Siberian wooded steppe and the taiga was the rent rate lower for sharecropping or for labor payment. The lower rate for money apparent in the above table was due both to possible services supplied by the non-cash renter and to simple supply and demand.[19] The renter who supplied land for a

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[18]Tiukavkin, Sibirskaia Derevnia, p. 155.

[19]Another possibility is that the wage rate was simply exaggerated. No information was given concerning the way in which the wage rate or rates used in the computation of the figures in Table IX.1 was given; however, a general perusal of the source suggests that Kuznetsov was a very careful investigator.

share of the crop or for work in effect also made a loan to the renting peasant since payment was deferred till the harvest. The renter could not get his share of a crop until after the harvest and, if he had accepted payment in labor services, such services almost always involved the harvesting of his own crops. Non-money payments also involved the acceptance of some risk. In sharecropping, the risk involved the size of the harvest and the price at which the marketed portion of the crop was sold. If payment was made in the form of labor services, the real return to the renter fluctuated with the price of labor and the price of the crop. Also, the supply of peasants wishing to sharecrop or pay rent with their labor had been swelled by the influx of immigrants eager to plant but short of ready cash. As for the three cases in which payment in cash did not earn a discoutn, I suspect that since the figures are for only 1 year, these are cases in which the renters supplying land for non-monetary payments in the given regions gambled on the weather and/or the grain and labor markets and lost.

Another fact which one notices is that virgin plowland was rented at a premium in the West Siberian wooded steppe; in the East Siberian wooded steppe, softened plowland was worth more. This is simply a matter of supply and demand. The much more densely settled Western Siberia had much less still virgin soil in 1913 than the sparsely populated East.

Third, in all but one instance (sharecropped hayfields in the West Siberian wooded steppe) in the above table was the sharecropping land user given a lower effective rent rate than the user paying his rent with labor services. This preference can also be easily explained by reference to the fact that most users of rented land were rich peasants with plenty of working stock and qquipment. The suppliers of rented land were usually poorer households whose only asset was a land allotment they could probably not work themselves anyway. Hence, there was a preference for cash or sharecropping rather than payment in labor services.

A fourth interesting fact about the figures in Table IX.1 concerns the ratios of prices for different types of land when payment is made in cash as opposed to labor services. For example, look at the ratios for the figures for the steppe region.

Payment in Cash: $\frac{\text{Virgin Plowland}}{\text{Softened Plowland}} = \frac{1.13}{1.38} = 0.82$

Payment in Labor: $\frac{\text{Virgin Plowland}}{\text{Softened Plowland}} = \frac{2.57}{} = 1.20$

Differences in the corresponding ratios for the Western and Eastern Siberian wooded steppe are also quite large; however, in the former case, both ratios are greater than one while in the latter, both ratios are less than one. The reason

for these peculiar differences between ratios which should be close is a simple one. Although each pair of ratios refers to one region, the relation between money and work prices differed radically between virgin plowland areas and softened plowland areas within any region. Softened plowland areas were well-settled; virgin plowland areas were on the frontier. Softened plowland areas had a more developed commerce with more money in circulation; virgin plowland frontier areas had a relatively less developed commerce with less money in circulation. Hence, the discount given for rental payment in cash was less in softened plowland areas than in virgin plowland frontier areas. Thus, in each region the gap between rental payments for money and for work is larger for virgin plowland than for softened plowland.

Finally, agricultural land in the taiga tended to be more expensive because of the extra labor involved in clearing forest lands.

There are quite probably other reasons for the land-type and method of payment preferences indicated in the above table; the reasons listed are only the most obvious and most reasonable for Siberia in the period considered.

Although Table IX.1 gives an excellent picture of the average terms for renting land, the degree of variance in rent rates is not indicated.

Appendix Table 4 suggests the extreme variability of rental rates across Siberia. A glance at this table shows that rental rates for agricultural land varied as much within any gubernia or oblast' of Siberia as they did across Siberia as a whole. This suggests, as expected, that such rates were determined more by local conditions of soil quality and nearness to the railroad and large cities than by any factors which varied uniformly across Siberia.

Table IX.1 and Appendix Tables 1 through 4 give a good picture of land rental relations in Siberia just before World War I. Some comments on the evolution of land renting over time are in order here. Land renting in Siberia had never been as important as it had been in European Russia.[20] The practice grew in importance with the influx of immigrants and, most important, with the government land restructuring program which sought to equalize landholdings per male soul while ignoring the inequality in holdings of other agriculturally productive assets such as livestock and equipment. Thus, the general trend of land renting in Siberia was opposite to that in European Russia. There, small peasants rented plots from the big landowners--the pomeschiks; in Siberia, rich peasants rented land from smaller and poorer peasant households in order to practice agriculture at a scale exceeding the 40.5 acre norm. Out of a total of 12.4

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[20] P.P. Rumianstev, compiler, Obzor Sel'sko-Khoziaistvennoi Zhizni Zaseliaemikh Raionov Aziatskoi Rossii za 1913 g. (Overview of Village Economic Life of the Settled Districts of Asiatic Russia During 1913), (Petersburg, 1914), p. 65.

million acres rented across Siberia just before World War I, some 9.4 million were rented to kulaks or rich peasants.[21]

Land rentals among peasants were generally on a short term basis, but in the more densely settled areas in which legalized formal land tenure had more completely replaced peasant custom, long term land rentals were more common. The prices of land rentals rose steadily as the influx of immigrants made land more economically scarce. But land rent rates in Siberia remained at levels equal to only one tenth to one fifth of rent rates in European Russia. However, land renting was of great importance. By 1910, one fifth of the sown area in Amur oblast' was rented; in Tomsk gubernia by 1914, 13% of sown area was rented.[22] In summary then, from the construction of the Trans-Siberian Railroad to the eve of World War I, land renting among the peasants in Siberia was very important, became increasingly widespread and expensive, and involved longer and longer terms.

Information on land sales and prices in Siberia is scattered and incomplete. This is the case evidently because of the letter of the law which proclaimed all

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[21]Tiukavkin, Sibirskaia Derevnia, p. 111.

[22]Istoriia Sibiri s Drevneishikh Vremen do Nashikh Dnei, Vol. III, p. 200.

Siberian land to be the property of either the Kabinet, State Treasury, or the Cossacks. Peasant landownership was based only on peasant custom up to 1906. Official records of land sales and prices would have amounted to documentation of illegal activity.[23] Officially, only a meeting of the village commune could decide to transfer land from one user to another or to allow its rental. In practice, however, even the volost' administrations ignored the law and volost' courts upheld this acceptance of peasant holdings as private property.[24]

Curiously enough, the law also stipulated that peasants exiled to Siberia by the government had no right to own, sell, or bequeath the land they worked.[25] But this provision was redundant since no other peasants had such rights either.

Considering the predominance of land tenure by simple seizure documented earlier in this section, it should not be surprising to learn that before the coming of the Trans-Siberian Railway much of the land not located in or near cities, trade centers, or important highways simply had no market value.[26] Yet the sale of land was openly practiced

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[23]Data on land prices in legal transactions has already been presented in Tables III.8 and III.9 in Chapter III.

[24]Tiukavkin, Sibirskaia Derevnia, p. 34, 87.

[25]Aziatskaia Rossiia, Vol. II, p. 534.

[26]Aziatskaia Rossiia, Vol. II, p. 570.

wherever the market price could rise above zero. Asalkhanov, a Soviet scholar, notes that land sales were prevalent in Irkutsk gubernia and Zabaikal oblast' over the entire second half of the 19th century.[27] As usual, peasant custom had ignored the law and sanctioned and regulated those practices (in this case, land sales) which were necessary for a smooth flow of economic activity. All this changed with the influx of immigrants brought by the railroad and with the government land restructuring policy. Failure to obtain clear title in many cases and the threat of the 40.5 acre norm fostered land transfer by rental rather than outright sale. The law further stipulated that a peasant could sell his allotment only to another peasant who might qualify for such an allotment.

In spite of these restrictions, peasants still managed to buy and sell some land even after the 1890's. Communes had long managed to circumvent the law by charging fees for the registration of new members. Such fees usually amounted to from 100 to 300 rubles per male soul, although the charge might drop below 100 rubles in scattered areas.[28] Since

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[27]I.A. Asalkhanov, Sotsialno-Ekonomicheskoe Razvitie Iugo-Vostochnoi Sibiri vo Vtoroi Polovinie XIX V. (The Socio-economic Development of Southeastern Siberia in the Second Half of the Nineteenth Century), (Ulan-Ude, 1963), p.93-96.

[28]Tiukavkin, Sibirskaia Derevnia, p. 88.

membership included the right to a plot of land to cultivate and use of common land, a large part of the fee was in reality a sale price for agricultural land.

Land sales between peasants became legal after the Stolypin land reform of 1906 allowed peasants to own land outside the commune. Yet peasants continued to conduct land transactions that were not officially sanctioned.

Thus, in Tomsk gubernia in 1909, 50% of the migrant plots taken up were not supplied by the immigrant land fund but were bought by scouts from old-settlers who were moving further east.[29]

This concludes our discussion of the land tenure, sale, and rental practices developed by the Siberian peasantry to solve the land allocation problem in Siberia. The main points to be noted are the following. (1) The peasants turned increasingly to common ownership and the authority of the mir rather than to private ownership and the market mechanism to allocate the scarcer types of land within the commune. (2) The Siberian peasantry also ignored the letter of the law and transferred land among themselves by outright sale when they could or by rental in instances in which that was more convenient or the government might impose limits

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[29]D.W. Treadgold, The Great Siberian Migration, (Princeton, 1957), p. 165.

on the amount of land which one peasant could own through the 40.5 acre per male norm. (3) Peasant land tenure, sale, and rental practices were very flexible and varied to suit local conditions and evolved over time with changing conditions.

D. The Supply of Hired Agricultural Labor

Because the peasant household was the major producing unit in the agricultural sector before collectivization, most of the agricultural labor force never went through the labor market. The vast majority of peasants worked in the households in which they lived. The number of laborers in each family was never documented for Siberia as a whole. A study was conducted, however, which collected detailed information about 6,023 households in 36 settlements of Tomsk gubernia in 1912.[30] The relationship between area sown and number of working members per household is reflected in the following table.

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[30] V.Ia. Nagnibed, Pereselentsi, Pripesavshiesia k Starozhilam, i Starozhily Altaisko-Tomskoi Chasti Sibiri (Migrants Registered to Old-Settler (Villages) and Old-Settlers of the Altai-Tomsk Part of Siberia), (Tomsk, 1927).

Table IX.2: Working Members Per Household in 6,023[31] Households Surveyed in Tomsk Gubernia in 1912

Area Sown	Peasant Group	Number of Households	Average Number of Working Members Per Household
0-8.1 acres	migrant	732	1.0
	old-settler	755	0.9
8.1-24.3 acres	migrant	1,254	1.3
	old-settler	1,386	1.2
over 24.3 acres	migrant	582	1.9
	old-settler	1,020	1.7
All groups	migrant	2,862	1.4
	old-settler	3,161	1.3

Although these figures apply to only a few households in Tomsk gubernia, they are probably typical for at least that part of Siberia with similar soil and climate conditions and, therefore, for most of Siberian agriculture. Poorer or richer soils probably entailed more or fewer acres sown per working household member while some special conditions (such as taiga requiring clearing or dry fields requiring irrigation) entailed fewer acres sown per family worker. The table suggests 2 general points. First, in any sowing category migrant households tend to have slightly more labor power in the family. This seems quite reasonable since migrant households were not able to sow as much until they had finished the necessary preparations of clearing, fencing, digging of drainage and irrigation

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[31] Tiukavkin, Sibirskaia Derevnia, p. 258.

ditches, and so forth. They also (as will be shown later) could hire less outside labor (probably for lack of cash), so they had to rely more on their own labor than did the old-settlers. The second point to be noted is the small and uniform number of working members per household across planting groups. Sown area per household increased more than in proportion to the number of working members per household. In fact, even the largest planting group, sowing over 24.3 acres, averaged less than 2 workers per household. This, at least for me, was rather surprising. I tended to picture the prosperous kulak household as sowing a huge area and consisting of up to 3 generations: an old patriarch ruling over 5 or 6 strapping sons and even some working-age grandsons. No doubt, there were such cases in Siberia but they evidently were the exception rather than the rule. The figures above suggest a more nuclear peasant household depending on the labor of the father and possibly a grown unmarried son. The economic reasons for such a nuclear as opposed to a more extended family arrangement are obvious. Free land was often available for the taking. A grown son, as an adult member of the commune, had a right to his own allotment. Most of the time even in Western Siberia, he could exercise this right without infringing on the land used by other members of the commune, so there would be little objection to his

starting a new household. He might merely work the same strips as he had for his father in his own name with his father's consent or search far enough from the center of the village until he found an unused parcel and work it. He might also leave the commune for the frontier. Nor did the government land-restructuring interfere much with this practice since a commune's officially recognized land claims were proportional to the number of adult male members (the 15 desiatina or 40.5 acre norm) Thus, there was no economic motive for keeping grown sons from starting their own households. There were also undoubtedly non-economic factors (the restlessness of youth, for instance) militating against the large extended peasant family structure. For these and other reasons, the agricultural peasant household was usually a 1 or 2 man operation.

The other source of labor (besides its own members) for the nuclear peasant household was the agricultural labor market. This market supplied workers for various types of jobs and for varying terms of employment. The most common agricultural laborer was the medium-term worker hired for from 1 month to 1 year; in Western Siberia in 1917, medium-term workers constituted 45% of all workers hired. The next largest group was the short-term workers--those hired for from 1 day to 1 month. This group composed 33% of the agricultural workers in Western Siberia in 1917. 13% to 15%

of the laborers were long-termers hired for a year or more. Only 7% were "job" workers hired only until a specific task was completed. The remainder of the labor force, sometimes 4% or 5%, was hired seasonally.[32]

All these workers participated in a Siberian agricultural labor market which was highly fragmented due to great distances, poor communication of information about wages and working conditions, and the fact that many hired laborers could not move since they were confined to certain areas as exiles or would not move since they would not abandon a good plot merely to get a better temporary job. The participation rate of new-settlers in the market for hired agricultural labor and the relative shares of workers supplied to that market by new-settler and old-settler households has already been discussed in Chapter VI, Section B, Subsection 3 above. That discussion suggests that slightly more than half the workers not employed in their own households were new-settlers. This would leave slightly less than half of the workers not employed in their own households as old-settlers. This would, however, exaggerate the share of old-settlers in the purely agricultural hired labor force since many of the old-

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[32]L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX (The Siberian Peasantry on the Edge of Two Centuries: The End of the Nineteenth-The Beginning of the Twentieth), (Novosibirsk, 1967), p.122; L.M. Goriushkin, Sotsial'no-Ekonomicheskie Predposylki Sotsialisticheskoe Revoliutsii v Sibirskoi Derevnie (The Socio-Economic Preconditions of the Socialist Revolution in the Siberian Village), (Novosibirsk, 1962), p.76.

settlers permanently in the village labor force must have been employed as village craftsmen. Most old-settlers had their rights to allotments of land as commune members and had been in residence long enough to amass inventory necessary to be self-employed. No doubt some old-settlers did support themselves as hired farmhands, but it is more likely that those old-settlers who abandoned self-employment in agriculture hired themselves out to exploit some talent for a craft rather than to become unskilled laborers. These factors strongly suggest that new-settler households were the predominant suppliers of unskilled agricultural laborers for hire in the villages of Siberia--especially in area newly opened to settlement. This predominance of new-settlers combined with the important role in supplying agricultural labor played by prisoners and exiles[33] suggests a highly inelastic labor supply curve in many local agricultural labor markets. This inelasticity stems from two a priori factors. First, neither new-settlers nor exiles moved much from one local market to another. New-settlers settled in an area because of the availability of a suitable allotment and would normally not leave it simply to find a better job as an unskilled laborer. Movement of exiles in Siberia was restricted by law. Thus, movement from one local labor market to another was held to a minimum. Second, within any local market new-settlers usually hired themselves out only to accumulate the stake necessary to become

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[33]See Chapter VII, Section A above.

independent farmers. Exiles, on the other hand, were restricted to certain economic activities. Thus, both groups were temporarily "locked in" to the market for agricultural labor regardless of reasonable variations in the wage level--new-settlers until they had accumulated sufficient capital to become independent farmers and exiles until their sentences were up. This conjecture of highly inelastic labor supply curves in many local markets is corroborated by the survey summarized in Table III.13 in Chapter III. This survey was conducted in 1913 with the purpose of ascertaining the long-term state of the agricultural labor markets in 2,522 villages in Siberia. Assuming that the villages chosen composed a good sample, only 60% of the villages in Siberia had lobor markets reasonably well equilibrated. The other 40% reported long-run shortages or surpluses of laborers. This is hardly the state of affairs to be expected if in general the relationship between the quantity of labor supplied and the wage rate was highly elastic. If the explanation due to inelasticity of labor supply is rejected, then another must be advanced to explain the apparent failure to achieve equilibrium in so many of the village labor markets of Siberia.

The supply curve for hired agricultural labor, besides being inelastic, was shifted left and right in a "horse race" between two forces. As new-settlers saved enough to become self-employed, they left the agricultural labor

market' this shifted the labor supply curve to the left. As new migrants arrived, they entered the agricultural labor force and shifted the curve to the right. In layman's terms, at any given time the supply of agricultural labor available for hire was more sensitive to the length of time in residence of the local peasant households than to the wages offered for work.

Let us turn for a moment to the employers of hired agricultural labor in Siberia.

As might be expected, the employers of agricultural labor tended to have characteristics opposed to those of the peasants they hired: employing households tended to be long-established, well-supplied with inventory, and to sow larger areas. While the large privately-owned enterprise was a major employer of hired agricultural labor in European Russia, the relatively wealthy peasant household fulfilled that role in Siberia.[34]

Information on hiring households is spotty; however, a review of some of it may be of value and is included in the Appendix to this chapter. Appendix Table 6, which relates term of residence to area cultivated and propensity to hire outside labor, gives us our first hint of the importance of past migration for the level of demand for hired agricultural labor. Not only did new-settlers quit hiring themselves out as they became established and planted larger areas, they also began to demand labor power on the agricultural labor

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[34]Goriushkin, Sotsialno-Ekonomicheskie Predposylki, p.77.

market. As time passed, a group of households which had settled in any given year switched from being a net supplier of agricultural labor to being a net demander. Thus, one might speculate that the total effect of one shot of migration on the local agricultural labor market ceteris paribus was as follows. The immediate effect was a sudden and dramatic shift of the labor supply curve to the right as new arrivals hired out as laborers. As they accumulated their stake, their steady withdrawal from the hired labor force shifted the supply curve back to the left, but it stopped somewhere to the right of its original position assuming that some new-settlers never did achieve full self-employment. The self-employed peasants then expanded their agricultural activity and found it necessary to hire outside help; this steadily shifted the demand curve for hired labor to the right. Which curve was shifted the most from its starting position is a function of the percentage of migrants who eventually became self-employed peasants and of the rate of arrival of migrants. This speculation ignores the effects of migration on the shapes of the supply and demand curves for hired agricultural labor. It also assumes that the elasticity of demand for agricultural goods from Siberia was extremely high--not an unreasonable assumption for a region which exported most of its agricultural output to either European Russia or the world market. The effective constraint on Siberian agricultural expansion was not

demand but the export capacity of the Trans-Siberian Railway.

We can now summarize the important role of immigration in determining the supply and demand relations in the local markets for hired agricultural labor in Siberia. Figure IX.1 on the following page illustrates this role. A priori reasoning alone can tell us nothing about the shape of the demand curve in Figure IX.1. However, the supply curve may be expected to be highly inelastic for the following reasons. (1) Communication between local markets was poor simply be because of distance. Also, movement of certain workers from one local markte to another was hindered by law which restricted the movements of working exiles, by the fact that proletarian old-settlers might lose the right to the allotments they rented out by leaving the commune of which they were members, and by the fact that new-settlers entered an area primarily because they could obtain a suitable parcel of land and would normally not leave it simply to find more lucrative temporary employment. (2) Within any local market, the pressure of both exiles and new-settlers favored a more inelastic labor supply curve. Exiles were usually restricted from obtaining allotments and engaging in independent agriculture, so they had to work as hired laborers to live regardless of the prevailing wage rate. New-settlers, likewise, had to hire themselves out almost regardless of

the wage rate to live--but only until they had accumulated the stake necessary to purchase the capital to become independent farmers.

A one-shot influx of migrants into a local labor market shifted the supply and demand curves for hired agricultural labor according to the following pattern. See Figure IX.1. (a) New migrant families move into the area. They must work as hired agricultural laborers until they have acquired sufficient capital to become independent farmers. This shifts the labor supply curve to the right. (b) As these same migrant households amass the necessary capital to become independent farmers, they withdraw from the market for hired agricultural labor to work their own plots. This shifts the labor supply curve to the left. The curve will not shift back to its original position since not all new-settler households will be successful in becoming independent farming households--some will remain in the labor market. My estimate is that this shift to the left should occur approximately seven years after settlement.[35]

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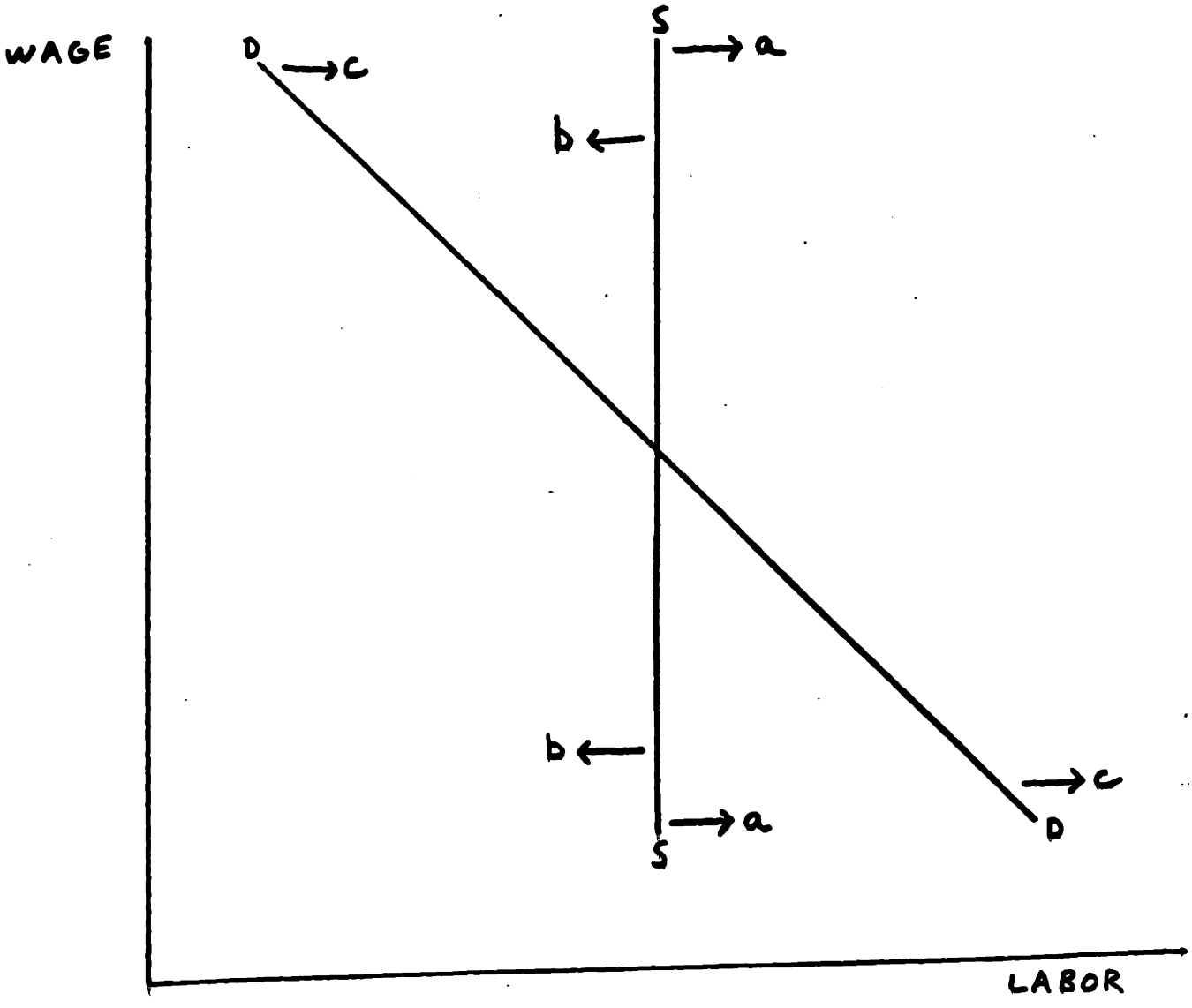
[35]This estimate is hardly more than my "educated guess." The available information on this subject has already been presented in Chapter VI, Section B, Subsection 3. The number of years which pass before a newly established household either stops supplying labor for hire or begins to demand it, of course, is highly variable and depends on local conditions. It is also quite likely that the withdrawal from the labor market as supplier and re-entry as demander both were gradual processes stretching over a number of years.

Figure IX.1: Demand and Supply Curves for Hired Agricultural Labor in Local Siberian Labor Markets



(c) As the new-settler household continues to prosper, its need for agricultural labor eventually outstrips its own capacity to supply; thus, it must re-enter the local agricultural labor market but this time as a demander of such labor. This shifts the demand curve to the right. My estimate is that this process took place approximately ten years after settlement.[36] Since not all new-settler households which eventually employed all their own members had to seek additional workers on the local market, the rightward shift of the demand curve will be less than the leftward shift of the supply curve described in (b) above and, therefore, also less than the rightward shift of the supply curve described in (a) above.

This mechanism can be summarized in mathematical terms as follows. Let M_t be the number of new households established in the area of the local labor market at time t. Assume that these households survive in perpetuity.[37] Let a be the proportion of new households the members of which never became self-employed.

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[36] See Footnote 35 and Table 6 in the Appendix to this chapter.

[37] This is not an unreasonable assumption. The driving mechanism of this model is the time lag between establishment of a new household and the accumulation of agricultural capital necessary for the household first to employ its own members and second to employ outside labor. When the head of a peasant household died, he did not take his agricultural capital with him. Rather, it was most likely bequeathed to his son.

$$0 \quad a \quad 1$$

Let $\underline{b}$ be the proportion of new households which never expanded to hire outside labor.

$$0 \quad a \quad b \quad 1$$

This is because proletarian households never hired outside labor. Furthermore, $\underline{b}$ is a function of the long-run wage rate, $\underline{w}$, which is assumed constant and sufficiently high to allow peasant saving from wages.

$$b = b(\bar{w}) \qquad \frac{db}{dw} \quad 0$$

Let $\underline{c}$ be the number of workers hired out by each household.

$$c \quad 0$$

Let $\underline{g}$ be the number of workers demanded by each household hiring outside labor.

$$g \quad 0$$

$\underline{g}$ is also a function of the long-run wage rate, $\bar{\underline{w}}$.

$$g = g(\bar{w}) \qquad \frac{dg}{dw} \quad 0$$

Both $\underline{b}$ and $\underline{g}$ are functions of the long-run wage rate because in order for a household to hire an extra laborer, it had to have sufficient capital to be able to employ him.

Purchase of such capital could involve significant expenditures--an extra plow and horse, for example. Such large outlays for capital would not be made simply to take advantage of a short-term drop in the wage rate. Rather, the household purchasing extra equipment or animals would have to be reasonably certain that labor to use the extra equipment or animals would be available over the long-run at a wage rate below some threshold level (the level at which total production costs including labor exceeded value of output). Otherwise, the peasant household would either be saddled with idle capacity or forced to operate at a loss. Neither $\underline{a}$ nor $\underline{c}$ are functions of $\bar{\underline{w}}$ since, as noted above, the supply of agricultural labor for hire depended not on the wage rate but on the availability of good land for new-settlers. It may be suggested that either $\underline{a}$ or $\underline{c}$ or both are functions of $\bar{\underline{w}}$. However, I have not considered this possibility because 1) it would not agree with my perception of the way the mechanism worked in Siberia, and 2) there is no way of determining the net effect of $\bar{\underline{w}}$ on either $\underline{a}$ or $\underline{c}$. If one assumes that new-settler households would respond to an increase in $\bar{\underline{w}}$ by remaining in the labor market and by supplying more workers, then

$$\frac{da}{dw} \quad 0 \qquad \text{and} \qquad \frac{dc}{dw} \quad 0.$$

However, if one takes the view that peasants entered the labor market only to accumulate the stake necessary for independent agriculture, then an increase in $\bar{w}$ might induce the peasant household to withdraw some workers from the market to work its own land and might allow some marginally independent households to save enough to leave the labor market as suppliers of labor and become completely self-employing. Then

$$\frac{da}{dw} \quad 0 \qquad \text{and} \qquad \frac{dc}{dw} \quad 0.$$

In any period $\underline{T}$, the supply of agricultural labor is

$$S_T = c \int_{T-7}^{T} M_t dt + ac \int_{0}^{T-7} M_t dt$$

The demand for agricultural labor is

$$D_T = g(\bar{w}) \cdot (1-b(\bar{w})) \int_{0}^{T-10} M_t dt$$

In equilibrium, $S_T = D_T$ or

$$c \int_{T-7}^{T} M_t dt + ac \int_{0}^{T-7} M_t dt = g(\bar{w}) \cdot (1-b(\bar{w})) \int_{0}^{T-10} M_t dt$$

Note that there is no mechanism which guarantees equilibrium in the short run assuming that $\bar{w}$ does not change. This fact coupled with the fact that lack of data makes estimation of a, b, c, g, or even M_t impossible means that no neat conclusions can be drawn from this incomplete model. It is, however, an accurate portrayal of the mechanism behind the operations of local markets for hired agricultural labor in Siberia.

Let us now turn to the subject of wages.

The study of wage levels in the Siberian agricultural labor market is complicated by the immense variety in mode of payment and other services which were rendered in conjunction with the wage bargain. Wages were paid in cash, in kind, in the form of food, shelter, and clothing, and in the form of use of especially good plots of land, machinery and othher equipment, or animals. In short, wages might be paid partly or wholly with any good or service that the employer might offer and the employee might be interested in. The most widespread forms of payment for agricultural labor were apparently cash, provision of food and clothing, goods produced on the farm, and prepayment of wages--that is, loans which were repaid with labor services. The Soviet scholar Goriushkin lists four types of loans common in the Siberian village, three of which involved repayment with labor services:

1) cash loans repaid with future work valued at significantly less than imm diately provided labor services; 2) provision of grain, seed, and/or clothing at rates not much higher than market prices paid for by future labor; 3) provision of seeding services or equipment paid for with future labor; 4) provision of agricultural goods or services paid for with a one-half or one-third share of the resulting harvest.[38]

The wage bargain in the Siberian agricultural labor market was not only extremely complex, but its conditions varied greatly from region to region. For example, in the urban districts of Tomsk gubernia only 5% of the households providing labor for hire did so to repay debts; the same figure in the backwoods Chulinsk district was 28%.[39] Soviet sources suggest that this indicates that rural households were more dominated by kulak money-lenders. A more likely reason is that rural residents had more to gain by borrowing; many of them were new-settlers eager for the stake they needed to set up independent agricultural households.

In Tiukalinsk okrug of Tobolsk gubernia, it was common for a poor peasant to obtain a loan of two rubles by agreeing to harvest 2.7 acres of grain upon his creditor's demand.[40] In this same okrug a study of 1,358 peasant and native households conducted in 1886-1887 revealed that of

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[38]Goriushkin, Sibirskoe Krest'ianstvo, p.81.

[39]Goriushkin, Sibirskoe Krest'ianstvo, p.80.

[40]Goriushkin, Sibirskoe Krest'ianstvo, p.81.

all the 438 or 32% of households which hired outside labor, 30% commonly pre-paid for work done; 43% of households supplying hired laborers had members who had received their wages in advance.[41] A similar study of 2,477 peasant households of 60 villages of Turinsk okrug of Tobolsk Gubernia in 1886-1887 showed that 13.2% of all households surveyed paid wages in advance for work done; 23.5% of households surveyed were working off debts by supplying hired labor.[42] Prepayment of wages also carried a heavy rate of interest: wages paid in advance for work to be done during the following harvest might be as much as a third lower than paid during or immediately after employment. In Tiukalinsk okrug of Tobolsk Gubernia in 1889, a worker hired by the day during the harvest got 40 kopeks per day; if his wages had been pre-paid the previous spring, he received only 25 to 30 kopeks for each day's labor.[43] Whether or not one considers this interest rate of 25% to 37 1/2% or even more a fair one, it is evidently the rate that prevailed. There was also the risk of default.

Non-cash payments for labor services were also quite common. Such payments usually took the form of food,

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[41]Goriushkin, Sibirskoe Krest'ianstvo, p.180; Goriushkin, Sotsialno-Ekonomicheskie Predposylki, p.53.

[42]Goriushkin, Sibirskoe Krest'ianstvo, p.79.

[43]Goriushkin, Sotsialno-Ekonomicheskie Predposylki, p.52.

clothing, or one or two desiatins (2.7-5.4 acres) from which the laborer might keep the harvest. Food for a year for a hired hand cost 48 to 90 rubles; clothing cost 50 to 55 rubles.[44] In 1911 and 1912 in Western Siberia, especially in the wooded steppe region, it was quite common to pay laborers half their wages in kind. This often involved providing the hired laborer with one or two desiatins (2.7-5.4 acres) he could sow with seed provided by his employer or with three desiatins (8.1 acres) he could sow with his own seed.[45] A cursory investigation of 21 villages in Tomsk gubernia showed that rich households commonly paid 49% of wages in kind; the equivalent figure for poorer households was 70%.[46]

The extensive study of 6,023 households in 36 settlements in Tomsk gubernia in 1912 discussed above also reported the following figures. Payments in kind were evaluated at local market prices. 1 422 male peasants hired as agricultural laborers were paid 30,754 rubles in cash and 15,893 rubles in kind of which about 70% was in the form of food. Hence, these peasants were paid 66% of their wages in cash, about 24% in food for their own

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[44] V.K. Kuznetsov, Sbornik Statisticheskikh Svedenii ob Ekonomicheskom Polozhenii Pereselentsev v Sibiri (Collection of Statistical Information About the Economic Position of Migrants in Siberia), (Petersburg, 1912), Part I, p.106.

[45] Goriushkin, Sotsialno-Ekonomicheskie Predposylki, p.85.

[46] Tiukavkin, Sibirskaia Derevnia, p. 266.

consumption, and about 10% in other commodities or services. Males hired for craft services or to perform tasks requiring special skills received 614,595 rubles in cash and 60,673 rubles worth of goods and services; they received 91% of their wages in cash. Further, it is estimated that men received about 67% of their wages in cash and that female workers were paid about 50% of their wages in cash.[47]

Having discussed the peculiarities of wage payments for agricultural labor, we turn now to study the level of wages in Siberia.

Appendix Table 15 makes clear the fact that, although wages were higher in Siberia than in the rest of European Russia as a whole, there were specific areas with even higher wages. The two most notable of these were the Northern Caucausus and the central industrial region surrounding Moscow. The very name of this latter region suggests that agricultural wages were high because alternative employment in industry was readily available. The conclusions which may be drawn from this information are the following: agricultural wage levels in European Russia as a whole were about 30% lower than those in Siberia. Specific regions did, however, offer higher agricultural wages than did Siberia. The rich and developing Northern Caucausus which did not come under the Cheliabinsk

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[47] Tuikavkin, Sibirskaia Derevnia, p. 265.

freight rate barrier against the export of grain to European Russia[48] is an example of one type. Another type is a more heavily industrialized region offering alternative employment in the industrial sector. It should also be noted that for every category and every season in each region, wages increase from 1901-1910 to 1911-1915. Also, wages are highest during the grain-harvesting season and lowest during spring planting except for male workers in the central industrial region. For them, wages are highest during the hay-mowing season and lowest during spring planting. This might be a reflection of the increased relative importance of horse power both for transportation and factory use in a more highly industrialized region.

Wage levels of agricultural labor in Siberia also varied from region to region and depended on the season, the sex of the worker, and the circumstances of employment. Wages also vaired over time. The available data relating to these factors are summarized in Table 16 in the Appendix. The text in the Appendix following Table 16 discusses the form of a regression using this data. Table 17 in the Appendix reports the results of this regression. The following discussion and Table IX.3 are based on Appendix Table 17.

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[48] See Chapter VII, Section B, Subsection 3.

To make explicit the effects of the various factors on wages, the following table is presented. It was computed simply be taking an arbitrary worker as the standard and then figuring the extra pay that worker would receive if he were in different circumstances. The standard worker chosen worked in Tomsk gubernia during the sowing season without supplying her own horse, was female, supplied her own food, and worked in the first period of our study, 1901-1905.

Table IX.3: Wage Premium in Kopeks Per Day Paid to Workers[49] in Circumstances Different from the "Standard"

Wage premium for working in different districts (Tomsk gubernia wage level is assumed standard)	
Tobolsk gubernia	1.4546
Tomsk gubernia	0
Yeniseysk gubernia	9.3333
Akmolinsk oblast'	1.1615
Semipalatinsk oblast'	4.0440
Irkutsk gubernia	18.3839
Zabaikal oblast'	23.3306
Wage premium for working in different seasons (Sowing season is the assumed standard)	
Sowing season	0
Haying season	9.6900
Harvesting season	15.8233
Wage premium for worker supplying his own horse (Without a horse is the assumed standard)	
Without own horse	0
With own horse	73.2173
Wage premium for male worker (Female worker is assumed standard)	
Female worker	0
Male worker	22.1161
Wage Difference for worker on household food (On own food is assumed standard)	
On own food	0
On household food	-18.3640
Wage differences for various periods (1901-1905 is assumed standard)	
1901-1905	0
1906-1910	11.08723
1909-1913	9.4231

[49]Based on Appendix Table 17.

Appendix Table 17 and Table IX.3 summarizing the regression results give interesting and reasonable figures. First, the relation estimated was able to explain 93.68% of the variance in the wage level if one interprets the R-squared in this way. The t and F statistics are almost all high enough to give reasonable assurance that the dummy variables really are as important as their respective coefficients suggest. The contents of Table IX.3 provide much information about the Siberian agricultural labor market. Wage levels definitely differed significantly by region with the highest wages offered to laborers in Eastern Siberia: 9.33 kopeks more per day in Yeniseysk gubernia; 18.38 kopeks per day more in Irkutsk gubernia; 23.33 kopeks per day more in Zabaikal oblast'. These are substantial amounts: an examination of the data table reveals that a male worker without a horse eating his own food in the period 1901-1910 received between 64 and 97 kopeks per day depending on the district and season in which he worked. Wage levels were also substantially affected by seasons: a day's work in the hay-mowing season brought 9.69 kopeks more than it did in the sowing season; the premium in the harvesting season was 15.82 kopeks a day. To what extent this premium was due to increased demand for labor and to what extent it was added compensation for harder work and more working hours per day cannot be determined from the information available. A

worker who brought his own horse received an extra 73.22 kopeks per day in cash wages. A male worker could evidently earn about 22.12 kopeks per day more than a female worker. The figures for the three time periods reflect the long-run trend of wages in the first thirteen years of the twentieth century. Wage levels in the period 1906-1910 exceeded those for 1901-1905 by 11.09 kopeks per day. A lowering of the wage level then followed for the partially overlapping period of 1909-1913 in which wages averaged 1.67 kopeks per day less than in 1906-1910.

Wages within Siberia also differed according to type of settlement and term of residence in Siberia as the following table indicates.

Table IX.4: Average Earnings of Hired Labor in Villages of[50] Tomsk Gubernia in 1914.

	Hired Worker		
	Migrants on Migrant Plots	Migrants in Old-Settler Villages	Old-Settlers
Average Annual Earnings Per Worker in Rubles	59.42	64.59	77.21
Average Daily Pay in Kopeks	61	62	68
Average Annual Days Worked Per Worker*	97	104	114
Average Pay for Harvesting 1 Desiatina (2.7 acres) in Rubles	6.91	8.91	9.25
Average Pay for Mowing 1 Desiatina in Rubles	3.29	3.60	4.15

(*Computed by me)

A glance at this table might tempt one to join Soviet scholars in asserting that rich old-settlers practiced discrimination against new-settler laborers. There is, however, an alternative explanation: wages were higher in old-settler villages simply because the supply of hired laborers was lower and demand for them higher in areas with more established households. In previous sections of this chapter, evidence has been presented that new residents supplied

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[50] Obzor Tomskoi Gubernii za 1914 g. v Sel'skokhoziaistvennom Otnozhenii (Survey of Tomsk Gubernia in 1914 in Rural Economic Relations), (Tomsk 1915), p. 97. Old-settlers were those who settled in Siberia before 1896.

hired labor to earn the stake neede to farm their own land; once they prospered, they became net demanders of hired agricultural labor. The figures in the above table are further evidence in favor of this hypothesis. Migrants on migrant plots were new residents in areas with high concentrations of new residents. Migrants in old-settler villages lived among neighbors with mixed terms of residence, so more households were net demanders of hired labor. Old-settlers lived both in areas with and without new-settler neighbors; those in areas without new-settler neighbors were paid more due to the more favorable local labor market and raised the average wage of their group as a whole.

The final question of concern to us in this section is the ability of agricultural laborers in Siberia to save from their wages a stake to set up an independent agricultural household. The Soviet scholar Tiukavkin estimated the average annual agricultural wage across Siberia in 1913 at 90 rubles plus food and clothing for a man; 42 rubles plus same for a woman; and 35 rubles plus food and clothing for a youth.[51] Thus, a husband and wife with no children could gross approximately 132 rubles per year plus food and clothing for themselves. The American scholar Treadgold reported that migrants settling in Siberia and the Far East

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[51]Tiukavkin, Sibirskaia Derevnia, p. 290.

in 1911 and 1912 had on average total assets of not quite 100 rubles per household including personal possessions and livestock.[52] Furthermore, in Chapter VI, Section A above, migration and start-up costs were estimated at 250 rubles per household after the opening of the railroad, provided a free government land allotment was obtained. Without the free allotment, these costs jumped to between 390 and 650 rubles. Thus, if we assume that the migrant family was able to invest only the husband's surplus from full-time employment, the time lag necessary before the household could engage in independent agriculture varied between 2.8 years with a free government allotment and 7.2 years at maximum land cost without one.[53] From these figures, it should be clear that a newly arrived household could usually accumulate the stake necessary to engage in agriculture on its own from the wages of its members.

E. Peasant Demand for Agricultural Equipment

1. Agricultural Equipment in Peasant Households

The role of the Tsarsist government in opening up the Siberian market for agricultural machinery has already been chronicled in Chapter VIII, Section B above. That section

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[52] Treadgold, p. 30.

[53] $250 \div 90 \approx 2.8$; $650 \div 90 \approx 7.2$. There is no reliable information concerning the numbers and ages of children in immigrant households.

also chronicled the growth of sales of agricultural equipment in Siberia. The peasant response to the opportunity provided to them resulted in the rapid accumulation of agricultural equipment in Siberia. Appendix Table 18 summarizes the stocks of various types of equipment per peasant household in European Russia and the districts of Siberia in 1910.

From Appendix Table 18 it is apparent that Siberian peasant households were better supplied than those of European Russia with reaping, threshing, and haying machines, but worse supplied with seeding and winnowing machines. If we consider this list as representative of advanced agricultural equipment (Plowing and hoeing machines were omitted from the source.) the table indicates that Siberian households were slightly better equipped with these than their European Russian counterparts. It should also be noted that the figures in Appendix Table 18 are for 1910 -- two years after migration had hit its peak. In 1910, many new-settler households were not yet ready to acquire new mechanized equipment; they were still probably clearing their land and buying livestock and iron plows. The presence of these new-settler households temporarily reduced figures of machines per household since each counted as a household but probably had little or no machinery.

Appendix Tables 19 and 20 provide further information about holdings of agricultural equipment per peasant house-

hold and per unit of sown area in Siberia and European Russia in 1917. These tables also indicate that Siberia was slighly better endowed with agricultural equipment in comparison with European Russia. The figures in Appendix Tables 18 through 20 combined with those in Chapter III, Section B on the quantity of agricultural equipment available in Chapter VIII, Section B on the sales of agricultural equipment in Siberia lead to the following conclussion. The peasantry of Siberia were very well supplied with agricultural equipment in comparison to the peasantry of European Russia. A number of factors combined to cause this. Siberia was a frontier region newly-settled, so machinery was purchased without having to wait for old equipment to wear out or prove itself uneconomical. During this period (1890-1917), much land was being worked for the first time and improved implements like the multiple-plowshare iron plow could take the intensive use better than wooden craft-made implements. Third, the Migration Administration took a hand both in the distribution and sale of agricultural capital and in providing loans for equipment purchases by peasants. Yet, it cannot be denied that these factors would have had no effect if the peasantry of Siberia had not been responsive to the opportunities afforded them to purchase agricultural equipment.

And the peasants did respond. They purchased agricultural equipment often on credit provided by either the Mi-

gration Administration or private firms. They also engaged in extensive renting of agricultural equipment amongst themselves. The Soviet scholar Goriushkin even reports that 20% to 25% of all Siberian peasant households rented agricultural machinery from their kulak neighbors.[54] He naturally saw this practice as a means of kulak exploitation of poorer peasants; another interpretation is that it allowed even peasants who could not afford to purchase machinery access to its use through rental. Within Siberia, the distribution of equipment, like that of the peasant population, favored the areas closer to European Russia. But the increasing scarcity of agricultural capital as one moved from west to east was connected with the fact that fewer peasant households were to be found as one moved from west to east. Pieces of equipment per household did not reflect this west to east pattern.[55] The degree of reliance on agricultural machinery, however, did drop dramatically as one moved farther from the railroad.[56]

We turn now to the problem of the distribution of agricultural capital among the various income classes of the Siberian peasantry.

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[54]Goriushkin, Sotsial'no-Ekonomicheskie Predposylki, p. 91.

[55]See Appendix Tables 18 and 19.

[56]Goriushkin, Sibirskoe Krest'ianstvo, p. 117.

If one does not subscribe to the Marxist analysis, the class distribution of agricultural capital in Siberia may be seen largely as a race between two opposing forces: the natural prosperity of the Siberian agricultural economy led to the expansion of agricultural activity by almost all classes of peasants and the accumulation of capital which naturally accompanies such expansion, while migration continued to supply capital-poor new arrivals. Thus, an increase in the proportion of capital-poor lower class peasants may simply mean that migration had temporarily outstripped the lower class peasants' ability to lift himself into middle class peasant economic status.

The wealth of information compiled by Soviet historians on the distribution of agricultural capital in Siberia is both helpful and misleading. The information itself is, of course, helpful but it is presented to prove one point -- the stratification of the Siberian peasantry into kulak and poor classes. Soviet historians almost inevitably classify peasant households by some measure of commitment to agricultural activity, usually sown area. Then they base their claims of class stratification on showing the relationship between agricultural activity and agricultural capital and completely ignore the fact that the two are technically related. Households which work more land are naturally going to maintain more working animals and equipment, while those

which engage in other activities such as lumbering, milling, trapping, and trading with the natives have less need of agricultural capital. An example may prove helpful. Assume we have 15 peasant households deriving various proportions of their equal incomes from agricultural activity. We then divide them into two groups, those planting more than ten acres and those planting less with the average sown area in the ten-or-more group being fifteen acres and the average sown area for the less-than-ten group being five acres. In addition, we know that the ten-plus group is composed of five household with five units of agricultural capital while the ten-or-less group is composed of ten households with only three and a thord units of agricultural capital between them. The table which might be composed by the Soviet historian would look something like this:

Limits of Sown Area in Acres	Number of Households	Number of Capital Units	Average Capital Per Household
0-10	10	3.33	0.33
10 or more	5	5.00	1.00
0 or more	15	8.33	0.56

The conclusion seems inescapable: the ten-or-more group is much richer than the other group since it has more agricultural capital per household. But not all the information is included in the table. The rest of the table should look something like this:

Limits of Sown Area in Acres	Average Sown Area Per Household	Total Sown Area in Group	Units of Capital Per Unit Sown Area
0-10	5	50	0.067
10 or more	15	75	0.067
0 or more	8.33	125	0.067

Our skewed capital distribution based on class now appears as little more than a statistical fluke, especially when one remembers that I stipulated above that all the households had the same income. The various households merely derive different proportions of their income from agriculture. Thus, the average capital per household varies only because the sown area per household varies and the capital-land ratio is fixed. Peasants sowing a smaller area could easily have obtained the use of capital by cooperative purchasing, trading capital services, or renting. In fact, the 1917 census reported that 59% to 60% of seeding, hay-mowing, and reaping machines, and horse-drawn rakes used by the peasants of Tobolsk gubernia were involved in rental transactions.[57] Furthermore, kulak peasant households might be more likely to go into the agricultural machinery rental business than their poorer neighbors. The kulak peasant had both the money and the need to learn techniques of maintenance for the machinery owned and used by his own household. Such knowledge was not easily obtained in a largely illiterate society; hence, learning to service a harvesting machine,

for example, involved much more than thumbing through a manual. Once he had learned to service one, the knowledgeable peasant could easily service a second and rent it out. Goriushkin claims that the 1917 census indicated that 20% to 25% of peasant households were involved in renting equipment from kulak neighbors for money, grain, or labor.[58] He naturally interprets this as an indication of poor peasants' enslavement to the kulaks, not as a means of allowing small farmers to obtain the use of improved agricultural capital equipment without purchasing it.

We are still left with the question of just what information is conveyed by tables relating holdings of agricultural capital to measures of agricultural activity such as sown area. Such tables do relate agricultural capital stock to income derived from agriculture (assuming such income is proportional to area sown), but there is no way of determiningincome derived from other sources; hence, total income cannot be determined. Ownership of capital cannot be used as a proxy for the availability of capital services since renting of agricultural capital between and within groups was apparently quite common. The tables cannot even tell us much about the technical relations between sown area and the use of various types of agricultural

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[57]Goriushkin, Sibirskoe Krest'ianstvo, p. 210-211.

[58]Goriushkin, Sibirskoe Krest'ianstvo, p. 210.

capital since ownership or lack of it apparently had little relation to the use of agricultural capital services. In conclusion then because of the prevalence of renting of agricultural capital (including working livestock) and the possibility that peasants derived significant shares of their incomes from non-agricultural activities, it is misleading to draw any conclusions other than those specified in the tables. In other words, a table which says that households sowing five to ten acres owned on the average one working horse each says exactly that and nothing more. The peasant who rented a plow because he only farmed a few acres and spent the rest of his time trapping sable was not necessarily being exploited by the kulak (if it was a kulak) who owned the plow.

Statistics of agricultural capital distribution by class often have the added disadvantage that they cover a single, intensively studies small area, usually an okrug, for only a short time period, usually one year. This factor makes comparison of class distribution of agricultural capital between regions or over time extremely difficult if not impossible. Nevertheless, for the sake of completeness some figures on class distribution of agricultural capital which have come to my attention are reported in Tables 21 through 24 in the Appendix to this chapter.

2. The Nature of the Advantages of Using Agricultural Equipment

If we look only at the figures for both old and new-settlers together in Table 3 of the Appendix to Chapter VI, a definite pattern emerges. The numbers of people, working horses, cows, transport vehicles, and wooden plows per acre of sown area decline as area sown increase. The number of iron plows per sown acre first increases and then drops off as sown area increases. The numbers of hay-mowing, reaping and binding, and threshing machines per acre sown increases as sown area increases. Why the apparent difference? One possible explanation pivots all types of agricultural capital on labor. If we use number of people per acre sown as a proxy for labor available to work the land, then a declining labor-land ratio would merely indicate that the land was being worked less intensively as farms got larger. This sounds quite reasonable. Next, one would have to classify agricultural capital into two classes: labor complements and labor substitutes. The meanings of these two terms are obvious: labor complements tend to increase or decrease in proportion (or at least in the same direction) as the quantity of labor; the quantity of services demanded from labor substitutes changes inversely to the demand for labor services <u>ceteris paribus</u>. For example, if one has a strong son capable of operating a

plow, one does not sell one's horse and hitch up one's son; one buys another horse and plow for the son to operate. Hence, the horse and plow act as labor complements; they allow the son's labor power to be used efficiently -- the son and the horse are not substitutes. On the other hand, a reaping and binding machine does displace labor since it can perform exactly the same function as a harvesting crew of workers. Now look at the "capital-land" ratios which moved in the same direction as the "labor-land" ratios when sown area increased. (The quotation marks are inserted as a reminder that there are real problems in interpreting these figures as such ratios.) These are the ratios for working horses, cows, transport vehicles, and wooden plows. All may be considered labor complements since human labor cannot substitute for their services. People (at least in normal circumstances) do not pull plows, give milk, meat and hides, carry heavy burdens, or turn the soil without tools. Yet all these capital units require human labor to be used: plows and horses must be guided; cows must be herded, tended, and milked; carts must be driven. On the other hand, the ratios for hay-mowing, reaping and binding, and threshing machines all move opposite to the labor-land ratios. These machines are obviously labor substitutes: they replace the man with the scythe or sicle and the man with the threshing flails. The case of the iron plow is an

interesting one since it seems so obviously to be a labor complement. One must remember that before World War I Siberia was in the process of replacing the wooden locally crafted plow with the iron and steel factory version. The wooden plow was both slower since it involved more friction with the soil and more labor intensive since it required more repair and maintenance. Hence, although the wooden plow was a labor complement, the steel plow was comparatively less of a labor complement and the switch-over from wooden plows to steel ones involved some net substitutes of capital for labor. This, then, is the reason why the iron plow-land ratio does not always move in the same direction as the labor-land ratio as farm size (measured as area sown) increases. If the expansion involved the replacement of wooden plows with steel ones, capital was substituted for labor. Otherwise, the addition of more steel plows required the additional use of labor services.

Another possible reason for the increase in hay-mowing, reaping and binding, and threshing machines per sown acre as area sown increased is that these pieces of equipment involved large lumps of expenditure and only kulak peasants could afford them. Hence, they bought the expensive machines both for their own use and to rent out to their pooer neighbors. This is fine except that it does not explain why the numbers of working horses, cows, transport vehicles, and

wooden and iron plows per acre sown should decline as sown area increased.

The peasant has to make extensive use of both equipment and animals even to begin working his own land.

The peasant farmer's first taks is to plow the land. If he is working virgin land, his task is much more difficult. The first plowing of virgin soil required two full days of work per desiatina (2.7 acres) with six to eight horses. Thus, six small households (with one horse each) could band together and work 0.5 desiatinas per day. After first plowing, it was necessary to harrow repeatedly to break down the upper layers of soil.[59]

Then, each time the land was plowed, the blade was able to cut deeper -- finally reaching a depth of about seven inches after three years.[60] It was not uncommon for a rich peasant with a steel plow and plenty of horses to use a poor man's allotment for two years retaining the harvest in return for working virgin soil.[61] This helps to explain why new-settlers often rented out their land and worked as agricultural laborers for their first few years in residence. It later became popular to plant flax as the first crop since

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[59]E.E. Geshele, Ocherki Razvitiia Sibirskogo Zemledeliia (Essays on the Development of Siberian Agriculture), (Omsk, 1957), p. 56-57.

[60]Kuznetsov, Part I, p. 104-105.

[61]Geshele, p. 57.

it loosened the topsoil and thus lessened the requirements for further plowing and harrowing.

After plowing comes planting. A man can sow by hand one desiatina (2.7 acres) in two or three hours.[62] Further labor was not usually required until harvest time; weeding was not a common practice. Collection of hay from one desiatina by hand required 1.5 man-days for mowing, another 1.5 man-days for raking and collecting into shocks; transporting the shocks and sweeping the hay into stacks used 0.75 man-days and 0.5 horse-days. Thus, the total labor time for harvesting one desiatina of hay came to 3.75 man-days and 0.5 horse-days. Harvesting of grain by hand had similar labor requirements. Harvesting with machinery -- reaper, binder, and sheaver -- usually required two men and two horses, but they could do two to three desiatinas (5.4 - 8.1 acres) in a day. With three horses, capacity was doubled to four to six desiatinas (10.8 to 16.2 acres) per day.[63]

The following table gives cost comparisons for working plowland with machinery and by hand. The figures were not converted to costs per acre since only their relative values are of interest here.

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[62]Kuznetsov, Part I, p. 105.

[63]Kuznetsov, Part I, p. 105-108.

Table IX.5: Average Expenditures in Rubles for Working One Desiatina (2.7 acres) of Plowland and Harvesting Its Crops in 1913[64]

District	Type of Field	Machine Harvest	Harvest by Hand Mower	Harvest With Sicle
Akmolinsk Oblast	virgin	16.32	16.52	19.40
	softened	12.52	12.72	15.60
Tobolsk gubernia	virgin	19.84	20.08	21.97
	softened	14.02	14.86	16.75
Tomsk gubernia	virgin	17.95	18.04	20.28
	softened	15.66	15.75	17.99
Yeniseysk gubernia	virgin	-	-	21.87
	softened	-	-	17.87
Irkutsk gubernia	virgin	27.80	28.20	29.50
	softened	22.10	22.50	23.80

The point to be noted in this table is that machine harvesting has a definite cost advantage over other methods just as one would expect. However, whether one was working softened or virgin plowland makes a larger difference in costs than whether or not one used machinery in harvesting.

Comparative cost data for hand versus machine cultivation are extremely scarce; the above figures are all that have come to my attention.

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[64] Tiukavkin, Sibirskaia Derevnia, p. 325.

F. Peasant Cultivation Practices

The evolution of the systems of field use and crop rotation in Siberia presents no surprises. As might be expected, the most land-extensive agriculture was practiced in areas in which land was virtually a free good. This was the perelog "system" of field use. It involved simply planting the same crop for five to ten years in succession. Then the land was abandoned for two to three years after which it was plowed, left fallow for another year, and seeded again. No attempt was made to enrich the soil or to rotate crops.[65] As land became something of a scarce input, successively more land-intensive systems were used. Land could be or become scarce for a number of reasons. The most obvious was migration of new-settlers; this increased the number of peasant farmers of the available acreage. Crop land was also scarce, however, in the forest zones where clearning a few desiatinas was costly; the three-field system had always been common in these zones. Distances alone also increased the cost of using crop land. A peasant with two fields, one close to his house and another five miles away, would naturally use the field close to him more intensively to cut down travel time. Crop land close to

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[65] Skliarov, p. 399.

the railroad was also used more intensively. In short, anything that contributed either to a decrease in the available acreage, an increase in complementary inputs such as in-migration of labor, or an increase in the costs of using more land tended to favor more land-intensive systems of field use.

The next most land-extensive system after the perelog was a modified perelog. It worked like the perelog except that the land was abandoned to fallow for several years after four to six harvests.[66] The peasant rested the land before it was completely exhausted. Some crop rotation also worked its way into the perelog-type systems. Oats were planted instead of wheat in some years. By the end of the nineteenth century, the most common system was a two-field one in which grain was followed by a season in black fallow. (The field was plowed a number of times and all wild vegetation was plowed under.) This cycle was then interrupted by abandonment to green fallow in which wild vegetation was not plowed under.[67] In areas in which land was more abundant, this period of green fallow lasted twelve to fifteen years. As land became increasingly scarce, however, the green fallow period was shortened to three to five years. This was

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[66]Skliarov, p. 399.

[67]Goriushkin, Sibirskoe Krest'ianstvo, p. 174

[68]Goriushkin, Sotsial'no-Eknomicheskie Predposylki, p. 35.

barely long enough for reasonably good soil to recover. Another drawback of this system was that the failure to seed grasses in green fallow resulted in the first harvests after green fallow being composed of 20% weeds.[68]

In areas in which the soil could no longer support the two-field system, the three and four-field systems were adopted. This occurred especially in the more populous districts close to the railroad after the turn of the century. These systems involved a cycle of one or two wheat crops (two for the four-field system), followed by oats and then by fallow.[69] Manuring of the soil was also increasingly common as was the sowing of grasses on green fallow and plowing and harrowing of black fallow. The ultimate in complexity of systems of field use was apparently the seven-field system used by new-settlers of German descent.[70]

An interesting question is whether a basic change such as a switch to the three-field system was due to sudden enlightenment of the ignorant (or a breaking-down of tradition) or a sudden change in economic conditions. There was ample opportunity for both of these factors to affect Siberian agriculture since migration of new-settlers both intro-

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[69]Goriushkin, Sibirskoe Krest'ianstvo, p. 176.

[70]Kuznetsov, Part I, p. 99-100.

duced peasants with long experience in land-intensive agriculture and made good plowland an increasingly scarce factor in many districts. This question may be easily answered by looking at the systems these new-settlers adopted. It was not uncommon for new-settlers upon arrival to break up their allotments into (about) three wedges and to experiment with systems of field use and crop rotation. The vast majority of these experimenting peasants ended up adopting some form of the perelog or two-field systems.[71] New-settlers who had a tradition of land-intensive agriculture from European Russia adopted systems of field use not unlike those of the old-settlers. This to me is decisive evidence that old-settlers were not inefficient (at least in comparisone to European Russian peasants) users of land.

It should be noted that the change-over to more land-intensive systems of field use was not a uniformly continuous process in time and space spreading gradually, say, outward from the railroad or the population centers. Soviet authors either throw up their hands at the crazy-quilt patterns systems of field use formed across Siberia or are reduced to enumberating uezds or even volosts according to the predominate system of field use in each. Systems of field use were in such a state of flux especially after

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[71]Tiukavkin, Sibirskaia Derevnia, p. 310.

1896 when the railroad was opened. Peasnats in the same village might use radically different systems, so how could one expect to find well-defined geographical patterns? In addition, the number of permutations on the three basic systems -- *perelog*, two-field, and three-field -- seemed endless. The only statement that can be made definitely is that the general trend was toward more land-intensive systems with shorter periods of abandonment to green fallow. In order to give some comparison of the land-intensiveness of agriculture in Western Siberia and in European Russia, the following table is presented.

Table IX.6: Share of Fallow in Total Peasant Arable Land[72] in 1917

Gubernia or *Oblast*	Percent of Arable Sown	Percent of Arable Under Black Fallow	Percent of Arable Under Green Fallow
Tobolsk	54.8	23.4	21.8
Akmolinsk*	49.9	2.9	47.2
Altai**	46.5	7.4	46.1
Tomsk	40.2	18.8	41.0
Western Siberia	47.9	13.1	39.0
European Russia	68.2	23.5	8.3

Oblast in Central Asia, just south of Western Siberia proper.
**Up to 1917, the southern part of Tomsk *gubernia*.

European Russia obviously had a larger share of its

arable land sown in 1917 than did Western Siberia. The other two columns in the table are also of interest since black fallow is land which is being plowed, harrowed, and probably fertilized while green fallow represents land either sown with grasses or abandoned to weeds. It should also be noted that Eastern Siberian systems of field use were even less land-intensive than the Western Siberian.

Clearly related to systems of field use and crop rotation is the practice of fertilizing the soil. This practice was unheard of in Siberia before the coming of the railroad in 1896. Some old-settler peasants even asserted that fertilizers were harmful to Siberian soil and only burned out crops.[73] In areas in which the three-field system was adopted, however, the spreading of manure was grudgingly acknowledged as necessary. Siberian peasants were often criticized by agricultural experts of the times for failure to enrich the soil through fertilizing. The peasants, however, apparently had good reasons for shunning this practice as long as they did. First, manuring was less effective in Siberian soil than in the soil of European Russia since cold hindered or even prevented its decomposition.[74] The permafrost a few feet down also prevented any dissipation of the

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[72]Goriushkin, Sotsial'no-Ekonomicheskie Predposylki, P. 34.

[73]Aziatskaia Rossiia, Vol. I, p. 266.

[74]Tiukavkin, Sibirskaia Derevnia, p. 312-313.

of the fertilizing material; thus, a peasant could "poison" his field by over-manuring it. In addition, the manure also contained weed seeds, so the spreading of manure amounted to seeding weeds. These problems were later reduced with careful techniques, heated cattle sheds, and careful choice of animal fodder.[75] So, the returns to fertilization were over-estimated by the experts whose experience had been with European Russian agriculture. The direct costs of using manure in Siberiawere also higher. Manure could profitably be transported up to three or four versts (1.99 to 2.65 miles), but it was not uncommon for Siberian peasants to have fields even farther from home.[76]

There was also an opportunity cost since in the treeless steppe districts where wood was scarce, animal dung was used for fuel and in the construction of cow sheds.[77] For these reasons, the practice of fertilizing the soil in Siberia was not generally accepted until the growing scarcity of land made it necessary. The high variability in the popularity of fertilizing is suggested in the table below.

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[75]Tiukavkin, Sibirskaia Derevnia, p. 313.

[76]Tiukavkin, Sibirskaia Derevnia, p. 313-314.

[77]Goriushkin, Sibirskoe Krest'ianstvo, p. 175.

Table IX.7: Percentages of Fertilized Fields in Uezds of[78] Tobolsk and Irkutsk Gubernias in 1913.

Tobolsk Gubernia		Irkutsk Gubernia	
Uezd	Percent of Fields Fertilized	Uezd	Percent of Fields Fertilized
Tobolsk	100	Nizhniudinsk	100
Turinsk	100	Balagansk	84
Tiumen	97	Irkutsk	67
Yalutorovsky	96	Verkholensk	61
Tarsk	72	Kirensk	0
Kurgan	37	Total	72
Ishim	?		

In addition, we are told that fertilizing was practiced in Tomsk and Mariinsk uezds of Tomsk gubernia and that there was no positive evidence of this practice in all of Yeniseysk gubernia in 1913.[79]

With respect to fertilization of the soil, native tribes were sometimes even more advanced than Russian peasants. The Buryats as early as 1896 were considered better farmers since they used their own seed instead of the more poorly cleaned seed sold in government stores and

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[78] P.P. Rumianstev, compiler, Obzor Sel'sko-Khoziaistvennoi Zhizni Zaseliaemikh Raionov Aziatskoi Rossii za 1913 g. (Overview of Village Economic Life of the Settled Districts of Asiatic Russia During 1913), (Petersburg, 1914), p. 35-36.

[79] Ruminastev, p. 35-36.

improved their fields with fertilizers and sowing of grasses.

In Zabaikal oblast', Russian peasants copied the manuring and irrigation techniques of the Buryats with great success since the yeild on irrigated fields was 50% higher than on non-irrigated ones.[80]

In conclusion, the systems of field use, crop rotation, and fertilization of the soil adopted by Siberian peasant farmers were highly flexible and apparently adjusted rapidly to changing conditions of land availability. This flexibility was present even at the village level since peasants in the same village were found to follow very different practices. Charges that the peasants used arable land inefficiently due either to ignorance or tradition seem to have been based on false preconceptions derived from familiarity with accepted practices in European Russia.

G. Peasant Response to Marketing Opportunities

The effectiveness of the individual response of the Siberian peasantry to marketing opportunities has already been indicated in Chapter III, Section A above, which chronicled the rapid growth in the output of butter, meat, and grain (especially wheat) between the completion of the railroad and World War I. The growth in the output of these products would not have been possible without the responsiveness of the Siberian peasanty to marketing opportunities.

The growth in the production and sale of butter required more than individual response, however. Whereas grain and animal products could be easily produced by the individual peasant household, the economies of scale associated with butter production with a mechanical separator required a capital investment beyond the means of most peasant households. This capital investment combined with the need to maintain quality standards and provide other services led to a pyramidal organization of the Siberian butter industry.

At the base of the pyramid were the individual butter-making "plants". The quotation marks are significant since these "plants" often as not consisted of one-room affairs operating only in the summer months when the availability of pasturage insured that the local cows would yield plenty of milk. For example, in 1910 out of 1,063 butter plants in Tobolsk gubernia, 79.1% used only hand power; 14.1% used horse power; 6.4% used both; and only 0.4% used steam power.[81]

On average, the equipment for a new butter-making plant cost only 600 rubles -- mostly for foreign-made machinery and tinned plates and dishes.[82] This meant that

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[81]Goriushkin, Sibirskoe Krest'ianstvo, p. 166.

[82]Tiukavkin, Sibirskaia Derevnia, p. 370.

any little backwater village or combination of small villages with sufficient cows and availability of transport (for butter, not milk) might have its own butter "plant". The fact that maintaining a large number of small plants close to the sources of milk lowered transport costs was important. A pound of butter in milk form weighed 21 pounds and could spoil quite easily; thus, transport costs to the butter plant could be the crucial factor preventing a village from participating in the world market. Large numbers of small plants overcame this difficulty in many cases. These plants could be privately owned or be owned and operated cooperatively by a peasant artel'.[83]

The butter plants eventually also expanded into distribution of manufactured wares to peasants and the butter-making artel's also became consumer cooperatives. This was quite natural since the wagons or whatever the transport facilities used to take the butter to market could carry consumer goods back to the village on the return trip. By 1917, 89% of the cooperative butter artel's and all the privately owned plants had trade shops and could pay for milk (at 45 to 50 kopeks per pood or 1.25 to 1.40 kopeks per pound in Western Siberia) with goods as well as cash.[84]

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[83] An artel' is an association of individuals to perform common work tasks.

[84] Goriushkin, Sotsial'no-Ekonomicheskie Predposylki, p. 88.

As the village artel' and privately owned plants formed the bottom of the Siberian butter production and distribution pyramid, the middle level was composed of various unions and associations usually covering all the plants (either private or artel') in a given geographical district. These served as disseminators of equipment, information, and expertise as well as middlemen in the transfer of butter to market. These unions or associations could cover a district composed of from a few villages up to an entire gubernia. At the top of the pyramid were the big butter exporting firms (often foreign firms) and the large Union of Siberian Butter-Making Artel's. The Danish "Siberian Company" bought and exported to foreign markets a fourth of Siberia's export butter through its 38 branches and export offices.[85]

The big export firms and the Union provided important services. They carried bargaining clout with the Railway Committee and shipping companies; thus, they were able to bring unified pressure for more refrigerator cars and better transport facilities. They were also instrumental in imposing quality standards on the butter they handled with the result that Siberian export butter easily met all export standards.[86]

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[85]Goriushkin, Sibirskoe Krest'ianstvo, p. 190.

The social organization of butter production and handling was an important factor in the rapid development of the Siberian butter industry. At the bottom of the pyramid, the myriad little plants minimized the distances for transporting milk and provided other services such as trading shops to peasant patrons. At the top of the pyramid, the Union and the giant export firms bargained for transport facilities and imposed quality standards. The middle-level associations provided equipment, expertise, and information for new plants being set up in their districts. Each level was well suited to performing its tasks. A hodge-podge of competing export firms could not have cooperated either in establishing a transport network or in setting quality standards; on the other hand, a giant export firm would probably have had difficulty finding many of the little backwaters capable of supporting a butter-making plant. In short, the organization of the Siberian butter industry gave it the advantages of both bigness and smallness where they counted most.

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[86]Meeting these standards did not guarantee that Siberian butter would automatically bring the high prices of Danish butter, but it did guarantee that Siberian butter would not be barred from any country because of low quality and that Siberian butter could take any further processing or additives which would raise its value. In fact, Denmark imported significant quantities of Siberian butter, processed it, and re-exported it.

The organization of this industry was due at least partly to the initiative of the peasants themselves and indicates their responsiveness to marketing opportunities and their ability to combine into producer cooperatives or artel's when it was necessary to take advantage of economies of scale.

H. Peasant Income and Wealth

Intensive studies of the incomes of the Siberian peasantry before World War I are very few, but they all indicate a significant ability to save from current income. The two major studies are those by Kuznetsov and Nagnibed.[87] They are summarized in the tables given below.

Table IX.8: Average Income, Expenditures, and Savings in Rubles of Old-Settler and New-Settler Households in Old-Settler Villages of the Altai Region (roughly the southern third) of Tomsk Gubernia in 1912[88]

Sowing Group	Total Income	Total Expenditures	Total Savings
0 to 10.8 acres	666.6 100%	552.2 83%	114.4 17%
10.8 to 27 acres	1,047.0 100%	924.9 88%	122.1 12%
over 27 acres	2,500.8 100%	2,211.0 88%	289.8 12%

[87] See footnotes 17 and 30.

[88] Tiukavkin, Sibirskaia Derevnia, p. 188-189.

The high rate of savings in the 0 to 10.8 acres group reflects the high rate of accumulation of agricultural capital among new-settler households striving to become independent agricultural producers.

Table IX.9: Average Income, Expenditure, and Savings in Rubles of New-Settler Households in Various Regions of Siberia[89]

Region of Settlement	Total Income	Total Expenditure	Total Savings
Steppe Region	538.5 100%	473.6 88%	64.7 12%
Western Siberian Wooded Steppe	724.8 100%	573.2 79%	151.6 21%
Eastern Siberian Wooded Steppe	586.2 100%	479.5 82%	106.4 18%
Taiga	362.4 100%	328.5 91%	33.9 9%

The figures for new-settlers in both Tables Ix.8 and IX.9 are confined to new-settler households which have been in residence for at least three years. Payments and expenditures in kind have been evaluated at local market prices and are included in the totals in these tables. The ability of both old and new-settler households to prosper in the economic environment of Siberia should be apparent from these two tables.

[89]Kuznetsov, Part I, p. 162-164.

The wealth holdings of Siberian peasants also indicate growing prosperity. In 1911-1912, the Kuznetsov survey of 21,752 new-settler households reported an average total wealth of 566 rubles per household with debts averaging 100 rubles per household; the net worth of 466 rubles was 277 rubles or 95% more than the average net worth of these same households back in European Russia. These households at the time of the survey had been settled in Siberia for an average of eleven years. If we consider the average net worth of these households at their time of settlement in Siberia -- 161 rubles each, then the 466 ruble figure represents an increase in average net worth of 305 rubles or 189%.[90]

The following talbe chronicles the growth in peasants' participation in institutionalized saving in Siberia.

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[90]Treadgold, p. 219.

Table IX.10: Deposits in State Savings Banks for Various Years in the Four Siberian Gubernias[91]

Number of Passbooks

Years	Total Number	Number Belonging to Farmers and Others*	Percent of Total
1901	87,102	13,411	15%
1905	137,373	25,051	18%
1910	179,705	42,854	24%
1915	244,504	60,650	25%

Deposits in Rubles

Years	Total Deposits	Deposits of Farmers and Others*	Percent of Total
1901	22,820,400	3,656,600	16%
1905	34,509,700	6,014,000	17%
1910	39,810,000	9,565,000	24%
1915	55,763,300	12,755,600	23%

*Others includes miners, hunters, fishermen, fowlers, and gatherers.

The sahre of the Siberian rural population in the total deposits in State Savings Banks was certainly not commensurate with their share in the total population of the region (90%), but it showed a tendency to increase over time and was by no means insignificant.

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[91]Goriushkin, Sibirskoe Krest'ianstvo, p. 399.

Savings in Siberia were also impressive when compared to those in Russia as a whole. Between 1901 and 1910, the total value of securities held by Siberian residents increased by 73.9%; the increase for all of Russia was 66.7%. In the years 1907 through 1909, money in Siberian savings accounts totalled on average 79.8 million rubles which was 31% of the total for the Russian Empire (253.7 million rubles), but Siberia contained only 11% of the population of the Empire.[92] Also, in some areas of Siberia savings deposits reached 20 rubles per person; this figure compares favorably with the wealthiest areas of the Empire.[93]

I. Evaluation of Peasant Response to Economic Opportunity in Siberian Agriculture

The Siberian peasantry was presented with two very different types of challenges. The first required the classical profit-maximizing response of the individual producing unit. The individual peasants moved to Siberia, set up their households, worked virgin land, maintained themselves as hired laborers, saved to purchase animals

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[92] Aziatskaia Rossiia, Vol. II, p. 440. The 79.8 million ruble figure is much larger than the figures in Table IX.10. Table IX.10 refers only to State Savings Banks; the above figure refers to all savings institutions.

[93] George Katkov, Erwin Oberlander, Nikolaus Poppe, Georg Von Rauch, editors, Russia Enters the Twentieth Century, 1894-1917, (London, 1971), p. 148.

and equipment, and usually became independent farmers. It was this profit-maximizing response which led to the rapid expansion in the output and export of grain, butter, meat and other animal products. This expansion would have been impossible if the individual peasants had not invested heavily in modern agricultural machinery or not been willing to experiment with various methods of field use and crop rotation. Furthermore, in all my research concerning Siberian agricultural development, I have not found a single instance in which the peasantry of Siberia were even accused of failure to respond to economic incentives.

The second type of challenge faced by the Siberian peasantry required a very different kind of response -- an institutional response. The peasants responded to problems which they could not individually solve through the mir. Besides using the mir as a buffer between themselves and the various levels of government and as a kind of social insurance cooperative, the peasants allocated the tax burden amongst themselves and developed their own land ownership and allocation system within the mir. The mir also became the basis for butter-making cooperatives and even consumer cooperatives when it became apparent that there were economies of scale to be exploited. All in all, it is rather remarkable that a largely illiterate Russian peasantry transplanted onto the Siberian frontier was able

not only to act both individually and cooperatively to prosper as they did, but also to develop cooperatively their own system of land ownership and allocation. They not only "played the game" exceedingly well, but when necessary, they were also able to "write the rules".

Appendix to Chapter IX

Table 1: Percentages of Rented Land Provided and Used by Various Groups in Siberia, the Urals and Turgai Oblast's to the West, and Akmolinsk Oblast' in Central Asia in 1913

Region	Old-Settlers	New-Settlers	Kirghiz Tribe	Cossacks and Other Persons	State
Urals Oblast'	81		19	-	-
Turgai Oblast'	37		63	-	-
Akmolinsk Oblast'	53.9	7.0	27.2	6.1	5.8
Tobolsk Gubernia	?	?	?	?	?
Tomsk Gubernia	57	23		-	20.0
*Yeniseysk Gubernia	63	31	-	-	5
*Irkutsk Gubernia	63	31	-	-	-
Percentages of Rented Land Used by Each Group					
Urals	?	?	?	?	
Turgai	?	?	?	?	
Akmolinsk	89.2	5.0	0.4	5.4	
Tobolsk	?	?	?	?	
Tomsk	?	?	?	?	
Yeniseysk	45	55	-	-	
Irkutsk	86	14	-	-	

(*These percentages do not add up to 100. No explanation was given for this.)

Source: Obzor Sel'sko-Khoziaistvennoi Zhizni Zaseliaemikh Raionov Aziatskoi Rossii za 1913 g., (Petersburg, 1914), p. 66.

Table 2: Land Rental Relations in Old-Settler Villages of Tomsk Gubernia in 1912 and 1913 in Acres

Households Grouped by Area Sown	Number of Households Studied	Using Rented Land		Providing Rented Land	
		Number	Percent	Number	Percent
0-8.1 acres	1,487	443	30%	210	14%
8.1-24.3	2,640	1,016	40%	151	6%
over 24.3	1,602	938	58%	27	1.5%
Total	5,729	2,397	42%	388	6%

Households Grouped by Area Sown	Sown Area		Rented Sown Area		Percent of Sown Area Rented*
	Total	Average	Total	Average	
0-8.1 acres	5,357	3.5	926	0.5	17%
8.1-24.3	40,905	16.2	3,267	1.4	8%
over 24.3	65,880	41.0	10,654	6.5	16%

*Figures presented in this column have been corrected by me.

Source: V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria, (Novosibirsk, 1966), p. 108-110.

Table 3: Land Rental Relations in Immigrant Villages of Tobolsk, Yeniseysk and Irkutsk Gubernias and Two Uezds of Akmolinsk Oblast' in 1912 and 1913 in Acres

Households Grouped by Area Sown	Number of Households Studied	Percent of Arable and Hayfields Given in Rent	Percent of Used Arable and Hayfields Rented
0-24.3 acres	23,005	5.6%	16.0%
over 24.3	4,187	1.5%	30.3%

Households Grouped by Area Sown	Average Arable Plus Hayfields Per Household	Average Arable Rented	Average Hayfields Rented
0-24.3 acres	32.1	0.3	3.5
over 24.3	94.0	9.2	17.8

Source: L.F. Skliarov, Pereselenie i Zemleustroistvo v Sibiri v Gody Stolypinskoi Agrarnoi Reformy, (Leningrad, 1962), p. 407.

Table 4: Rental Rates for Agricultural Land In Siberia in 1913 in Rubles Per Acre

Price Range	Akmolinsk Oblast'	Tobolsk Gubernia	Tomsk Gubernia	Yeniseysk Gubernia	Irkutsk Gubernia
Rent for One Acre of Virgin Plowland in Rubles for One Year					
Long Term:					
Low	-	0.28	-	-	-
High	-	5.56	-	-	-
Average	1.17	1.50	-	-	-
One-Sowing:					
Low	-	0.18	0.06	0.56	-
High	-	7.41	7.41	8.89	-
Average	1.61	1.73	1.27	2.38	-
Rent for One Acre of Softened Plowland in Rubles for One Year					
Long Term:					
Low	-	0.23	-	-	0.18
High	-	4.44	-	-	2.22
Average	0.89	1.46	-	-	1.11
One-Sowing:					
Low	-	0.15	0.05	0.28	0.37
High	-	5.56	4.44	4.17	11.11
Average	1.38	1.52	0.92	1.44	2.70
Rent for One Acre of Hayfields for One Year by Type					
Steppe (Treeless Grasslands)					
Low	-	0.11	0.09	0.09	0.07
High	-	3.70	2.78	1.11	2.59
Average	0.30	0.67	0.71	0.40	0.52
Long Fallow:					
Low	-	0.06	0.09	0.17	-
High	-	6.67	2.78	1.39	-
Average	0.36	0.92	0.77	0.54	-

Price Range	Akmolinsk Oblast'	Tobolsk Gubernia	Tomsk Gubernia	Yeniseysk Gubernia	Irkutsk Gubernia
Meadow:					
Low	-	0.06	0.09	0.14	0.18
High	-	9.26	5.56	1.94	8.89
Average	1.32	1.28	1.11	0.64	1.57
Watered or Flooded Meadow:					
Low	-	-	-	0.56	2.96
High	-	-	-	2.47	3.70
Average	-	-	-	1.07	3.33
Forest:					
Low	-	-	-	0.08	0.11
High	-	-	-	0.83	2.59
Average	-	-	-	0.33	1.11

Source: Obzor Sel'sko-Khoziaistvennoi Zhizni Zaseliaemikh Raionov Aziatskoi Rossii za 1913 g., (Petersburg, 1914), Table IV, p. 143-153.

Data on Siberian Peasant Households Which Hired Outside Agricultural Labor

Information on hiring households is spotty; however, a review of some of it may be of value. Census data for Irkutsk gubernia in the 1880's revealed that out of 21,619 registered peasant households in 3 okrugs, 3,260 or 15% hired 4,246 workers for terms of a year or more.[1] So, the average number of long-term laborers in households hiring them was 1.3. A study of 2,477 peasant households in 60 villages of Turinsk okrug in 1886-1887 showed the following.

Table 5: Share of Households Hiring Workers for Given Terms of Employment in Sixty Villages of Turinsk Okrug of Tobolsk Gubernia in 1886-1887.

Term of Employment	Share of Households Hiring
Over a year	4.8%
Less than a year	3.7%
Female laborers for any term	3.7%
By day or for given task:	
Reaping	21.6%
Haying	25.7%
Threshing	26.1%

Source: L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p. 79.

[1] Tiukavkin, Sibirskaia Derevnia, p. 139.

A similar study of 1,358 households in Tiukalinsk okrug recorded 438 households or 32% hiring outside labor.[2] These studies suggest that in the 1880's, about 30% of peasant households in Siberia used hired labor of one sort or another. The first study (to my knowledge) which groups hiring households by term of residence was conducted in 1894 in Altai okrug and involved 18,521 households. Its results are summarized in the table below.

Table 6: Share of Households Hiring Outside Labor in Altai Okrug in 1894

Term of Residence	Average Cultivated Area Per Household	Share of Households Hiring Outside Labor
0-1 year	11.9 acres	5.7%
3-5 years	21.6 acres	7.7%
5-10 years	27 acres	20.5%

Source: A.A. Kaufman, Pereselenie i Kolonozatsiia, (Petersburg, 1905), p. 292.

Most of the surveys dealing with the employment of agricultural labor were clustered into the few years preceding World War I. The following table summarizes the results of one of these surveys; it covered migrant households distributed over Siberia for 1911 and 1912.

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[2]Goriushkin, Sibirskoe Krest'ianstvo, p. 80.

Table 7: Employment of Agricultural Laborers in 18,488 Migrant Households Distributed Over Siberia in 1911 and 1912

	Planting Group		
	0-24.3 acres	24.3 or more acres	Total
Number of households studied:	15,033	3,455	18,488
Percentage of Total	81%	19%	100%
Workers employed for a month or more*:	650	1,264	1,914
Percentage of Total	34%	66%	100%
Workers employed for less than a month*:	45,236	28,856	74,092
Percentage of Total	61%	39%	100%
Total Expenditures on hired labor in rubles**:	68,033	73,330	141,363
Percentage of Total	48%	52%	
Average number of workers hired for less than a month per household:	0.04	0.37	0.10
Average number of workers hired for less than a month per household:	3.0	8.4	4.0
Average expenditure on outside labor in rubles per household:	4.5	21.2	7.7

*Note: Since data was gathered through hiring households, a worker was counted once for each household in which he was employed.

**Note: Also includes payment to labor hired to complete a given task as well as to labor hired by term.

Source: V.K. Kuznetsov, Sbornik Statisticheskikh Svedenii ob Ekonomicheskom Polozhenii Pereselentsev v Sibiri, (Petersburg, 1912), Part V, p. 46.

The pattern in hiring apparant in the above table is precisely what might be expected from mostly nuclear peasant households (operated by one or two full-time workers). Households tilling a larger area hired more outside labor, but they also hired a greater proportion of it for longer terms.

A census taken in 1912 to estimate Russia's ability to conduct a war revealed the following information about the hiring of agricultural labor in the peasant households of Barnaul uezd.

Table *: Hiring of Medium-Term Workers in Barnaul Uezd in 1912

Sown Area Per Household	Number of Households Studied	Number of Medium-Term (Hired for month to a year) Workers Per 100 Households
0-5.4 acres	1,687	0.9
5.4-10.8 acres	1,304	2.5
10.8-27 acres	2,090	4.1
27-43.2 acres	710	11.2
over 43.2 acres	528	20
Total	6,319	4.2

Source: L.M. Goriushkin, Sotsial'no-Eknomicheskie Predposylki Sotsialisticheskoi Revoliutsii v Sibirskoi Derevnie, (Novosibirsk, 1962), p. 104.

It is apparent that the use of medium-term outside labor is positively related to the agricultural activity of the household. No other conclusions can be drawn since the hiring practices with regard to other than medium-term labor were not considered. The table is included here because it gives a five-group breakdown by sown area.

Probably the most extensive survey of hiring practices of Siberian agricultural households was conducted in Tomsk gubernia in 1912. It covered 6.023 households in 26 settlements. The information on hiring practices is summarized in the following tables.

Long-term workers are hired for a year or more; medium-term for a month to a year; and short-term for less than a month. All figures are for the group defined immediately above them. It should also be noted that the figures included 96 millers and shopkeepers of whom 3 planted nothing and 24 planted less than 8.1 acres.

Table 9: Number and Percentage of Households Grouped by Area Sown and Term of Residence Hiring Outside Labor for Various Terms

Long-Term	Medium-Term	Short-Term	For Task	Total
732 migrant households sowing 0 to 8.1 acres:				
8	12	43	82	132
1.1%	1.6%	5.9%	11.2%	18.1%
755 old-settler households sowing 0 to 8.1 acres:				
20	19	72	69	150
2.7%	2.6%	9.6%	9.2%	20.0%
1,487 households of both types sowing 0 to 8.1 acres:				
28	31	115	151	282
1.8%	2.1%	7.7%	10.1%	19.0%
1,254 migrant households sowing 8.1 to 24.3 acres:				
21	87	345	113	451
1.7%	7.0%	27.7%	9.0%	26.0%
1,386 old-settler households sowing 8.1 to 24.3 acres:				
45	126	538	217	686
3.2%	9.1%	39.0%	15.8%	50.0%
2,640 households of both types sowing 8.1 to 24.3 acres:				
66	213	883	330	1,137
2.5%	8.1%	33.4%	12.5%	43.1%
582 migrant households sowing over 24.3 acres:				
41	130	301	81	374
7.1%	22.4%	52.0%	14.0%	64.5%
1,020 old-settler households sowing over 24.3 acres:				
113	426	548	312	805
11.1%	41.8%	53.7%	30.6%	80.0%
1,602 old-settler households of both types sowing over 24.3:				
154	556	848	393	1,179
9.6%	34.7%	53.0%	24.6%	73.7%
2,862 migrant households of all sowing groups:				
84	239	708	286	992
2.9%	8.4%	24.8%	10.0%	34.7%
3.161 old-settler households of all sowing groups:				
178	571	1,158	588	1,641
5.6%	18.1%	36.6%	19.0%	51.9%

6,023 households of both types of all sowing groups:				
262	810	1,866	874	2,633
4.4%	13.4%	31.0%	14.5%	43.7%

Source: V. Ia. Nagnibed, Pereselentsi, Pripisavshiesia k Starozhilam, i Starozhily Altaisko-Tomskoi Chasti Sibiri, (Tomsk, 1927), p. 193-194, 198-199; V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria, (Novosibirsk, 1966), p. 258.

The following tables provide information about the expenditures for hired labor by these households grouped by area sown. Migrant and old-settler households were not distinguished in these tables.

Table 10: Total Expenditure in Rubles for Hired Labor by Households Grouped by Sown Area

Planting Group	Long-Term	Medium-Term	Short-Term	For task	Total
0-8.1 acres	5,034	1,293	1,088	1,439	8,853
8.1-24.3	4,373	5,505	9,365	5,819	25,062
over 24.3	11,913	20,081	22,355	12,387	66,736
Total	23,770	27,137	33,200	19.862	103,969

Source: V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria, (Novosibirsk, 1966), p. 261.

Table 11: Average Expenditures in Rubles for Hired Labor by Hiring Households Grouped by Sown Area

Planting Group	Long-Term	Medium-Term	Short-Term	For Task	Total
0-8.1 acres	179.8	41.7	9.5	9.5	31.4
8.1-24.3	66.3	25.8	10.6	17.6	22.0
over 24.3	77.3	36.1	26.3	31.5	56.6
Total	90.7	33.5	18.0	22.7	39.5

Source: Same as Table 10 above.

Table 12: Average Expenditures in Rubles for Hired Labor by Hiring and Non-Hiring Households Grouped by Sown Area

Planting Group	Average Expenditure on Hired Labor Per Household
0-8.1 acres	6.0
8.1-24.3 acres	9.4
over 24.3 acres	41.8
Total	17.2

Source: Same as Table 10 above.

In addition, we are told that it cost an average of 66 kopeks to hire a worker for one day in these settlements.[3]

We now come to the difficult task of determining the significance, if any, of the patterns apparent in Tables 9-12. The percentage figures in Table 9 will be discussed first. The first point to be noted is that in every planting group and for every term of hire, a larger share of old-settler households than of new-settler households hired outside labor -- except for laborers hired for a given task in the group sowing the smallest area. This phenomenon can be explained by two factors. First, as noted in Table IX.2 in all sowing groups migrant households averaged slightly more resident labor per household; hence, they had less need for hired labor. Second, old-settlers were, in general, better off than migrants, so it would be reasonable to ex-

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[3]Tiukavkin, Sibirskaia Derevnia, p. 262.

pect that in any sowing group the old-settler households would tend to cluster toward the upper limit while the new-settler households would concentrate closer to the lower limit of the planting group. Those households which sowed a larger area would naturally need to hire more outside labor. This also explains why the share of either type of household hiring outside labor for any term increased steadily with the area sown. Another pattern is also apparent: as the sown area per household increased, so did the tendency to hire labor for longer terms simply because there was more work to be done over longer periods of time. Thus, of hiring households planting 0 to 8.1 acres, 53% (10.1/19.0) hired laborers to complete a specific task. Of hiring households planting 8.1 to 24.3 acres, 77% (33.4/43.1) hired workers for from a day to a month. A litany of percentages in unnecessary since the pattern is obvious from the table: as households increased, the area they planted, they not only hired more outside labor but also tended to hire a larger proportion of it for longer terms.

The other tables in the group, Tables 10-12, presenting data on ruble expenditures for outside labor by peasant households, are consistent with the conclusions drawn in the above paragraph. The figures for longer-term hiring expenditures by households in the lower sowing

groups were inflated by the presence of the 96 millers and shopkeeprs mentioned above. Nevertheless, it may be enlightening to compute the average number of days worked by hired laborers per household for the various planting groups. This can be done by dividing expenditures on hired labor per household by the average cost of hiring a laborer for a day (66 kopeks).

Table 13: Average Number of Days Worked by Hired Labor Per Household for the Various Planting Groups

Planting Group	Average Workdays in Households Hiring Outside Labor (Non-Hiring Households Excluded)	Average Workdays for All Households (Both Hiring OUtside Labor and Relying Only on Their Own Labor) in Planting Group
0-8.1 acres	47.6	9.1
8.1-24.3 acres	33.3	14.2
over 24.3 acres	85.8	63.3
Total	59.8	26.1

Source: Tables 10 through 12 above.

One odd phenomenon in Table 13 is the apparent dip in column two from 47.6 workdays to 33.3 workdays per hiring household as area sown increases. This can be easily explained. The 47.6 workdays per hiring household figure covers many craft and shopkeeper households which sowed little or no area but hired outside labor extensively. Households sowing between 0 and 8.1 acres which hired no outside labor are excluded from the 47.6 workdays figure.

These two factors bias the 47.6 workdays figure upward since it covers some non-agricultural households which hired outside labor and exludes agricultural households which hired none.

Table 14 below is purported to be based on the same study as Tables 9 through 13 above.

Table 14: Valuation of Labor Power Used in Old-Settler Households of Tomsk Gubernia in 1912 in Rubles

Area Sown Per Household	Average Expenditures on Hired Labor Per Household	Valuation of Labor Services of Working Family Members Per Household	Valuation of Total Labor Power Used Per House-Hold
0-10.8 acres	7.2	131.3	138.5
10.8-27 acres	27.3	153.8	181.2
over 27 acres	196.0*	235.9	431.9

(*Note: This figure is more than three times the 56.6 rubles given in Table 11 above as the average payment per hiring household in the 24.3 acres and over sowing category. Admittedly, the 56.6 ruble figure is for both old-settler and migrant households, but this cannot explain such a difference. There is either some error or the figures are based on very different samples of peasant households.)

Source: V.G. Tiukavkin, Sibirskaia Derevnia Nakanune Oktiabria, (Novosibirsk, 1966), p. 225; V. Ia. Nagnibed, Pereselentsi, Pripisavshiesia k Starozhilam, i Starozhily Altaisko-Tomskoi Chasti Sibiri, (Tomsk, 1927), p. 480-500.

Other information concerning the demand for hired agricultural labor in Siberia which has come to my attention relates term of settlement and sown area to hiring

practices. In Tomsk gubernia in 1912, 52% of old-settler households employed outside labor; the equivalent figure for migrant households was 35%. So, 44% of all households employed some outside labor.[4] From the viewpoint of the agricultural laborer, 68% of those hired in Tomsk gubernia worked for old-settler households in 1912; in 1913, the figure was 69%.[5] Tomsk gubernia was, however, the largest user of hired agricultural labor per household in Siberia.[6]

In the early war years in Tobolsk and Irkutsk gubernias and Akmolinsk and Zabaikal oblasts, only 6.3% or 49,500 peasant households were employing some 57,900 workers for terms of a month or more.[7] This low percentage probably reflects the early effects of conscription: the rural areas of Asiatic Russia eventually lost some 1.2 million men or almost 12% of their population to the mobilization effort.[8]

According to the census of 1917, in the various districts of Siberia hired labor was used by between 18.6% and 31.3% of all peasant households.[9]

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[4]Tiukavkin, Sibirskaia Derevnia, p. 460.

[5]Goriushkin, Sibirskoe Krest'iantvo, p. 121.

[6]Tiukavkin, Sibirskaia Derevnia, p. 461.

[7]Istoriia Sibiri s Drevneishikh Vremen do Nashikh Dnei, Vol. III, p. 445.

[8]Istoriia Sibiri s Drevneishikh Vremen do Nashikh Dnei, Vol. III, p. 440.

[9]Gorisushkin, Sibirskoe Krest'ianstvo, p. 124.

Data on Wage Levels

The table below gives comparative figures on wage levels for different categories of agricultural labor for four regions of the Russian Empire from 1901 to 1915. The figures are further broken down by season of employment: a) during the spring planting season; b) during the hay-mowing season; c) during the grain-harvesting season. Western Siberia is here composed of Tomsk and Tobolsk gubernias and Akmolinsk oblast'. Starred items are greater than the corresponding figures for Western Siberia.

Table 15: Regional Average Prices for Labor in 1901-1915 in Kopeks Per Day

Season	Western Siberia	Central Agricultural Region of European Russia	Central Industrial Region of European Russia	Northern Caucausus Region
Male worker with horse on his own food, 1901-1910:				
a	145	115	145	160*
b	145	126	158*	214*
c	152.3	143	152	230*
Male worker with horse on his own food, 1911-1915:				
a	179	156	197*	223*
b	195	177	222*	282*
c	200	190	211*	298*
Male worker on foot on his own food, 1901-1910:				
a	67	49	71*	73*
b	75	67	94*	111*
c	84	73	79	150*

(continued)

Season	Western Siberia	Central Agricultural Region of European Russia	Central Industrial Region of European Russia	Northern Caucausus Region
Male worker on foot on his own food, 1911-1915:				
a	86	67	98*	90*
b	101	96	132*	140*
c	105.3	106*	113*	143*
Male worker on foot on household food, 1901-1910:				
a	48.3	38	55*	61*
b	63	54	74*	91*
c	67.6	59	63	117*
Male worker on foot on household food, 1911-1915:				
a	61.3	51	75*	73*
b	78	77	96*	111*
c	85	87*	87*	136*
Female worker on her own food, 1901-1910:				
a	44	28	43	54*
b	56	35	52	73*
c	61.3	47	54	93*
Female worker on her own food, 1911-1915:				
a	54.3	37	59*	68*
b	68.3	48	74*	90*
c	79.3	66	77	100*
Female worker on household food, 1901-1910:				
a	32.3	22	32	41*
b	41	28	40	55*
c	48.3	37	43	76*
Female worker on household food, 1911-1915:				
a	37.1	28	43*	51*
b	50.3	37	56*	70*
c	62	53	59	81*

(continued)

Administrative Units Composing the Regions in this Table

Central Agricultural Region	Central Industrial Region	Northern Caucausus Region
Kursk	Vladimir	Kuban
Orel	Moscow	Stavropol
Tula	Kaluga	Terek
Tambov	Tver	
Voronezh	Yaroslav	
	Kostroma	

Source: Sbornik Statistiko-Ekonomicheskikh Svedenii po Sel'skomu Khoziaistvu Rossii i Inostrannikh Gosudarstv, Vol. X, (Petersburg, 1916), p. 530-533.

Table 16 given below, though incomplete, probably gives the best summary of agricultural wages across Siberia for the early twentieth century that is available. The letter codes once again represent: a) spring planting; b) hay-mowing season; c) grain-harvesting season.

Table 16: Average Wages to Siberian Agricultural Workers in Kopeks Per Day

Season and District	1901-1905	1906-1910	1901-1910	1909-1913
Average wages to male with horse on his own food in kopeks per day:				
Tobolsk gubernia:				
a	127	155	141	-
b	125	155	140	-
c	136	159	148	-
Tomsk gubernia:				
a	125	148	187	-
b	100	156	128	-
c	142	156	149	-
Yeniseysk gubernia:				
a	142	156	149	-
b	156	179	168	-
c	159	177	168	-
Akmolinsk oblast':				
a	126	147	139	-
b	145	186	166	-
c	160	159	160	-
Semipalatinsk oblast':				
a	-	164	-	-
b	-	162	-	-
c	-	180	-	-
Irkutsk gubernia:				
a	-	177	-	-
b	-	-	-	-
c	-	187	-	-
Zabaikal oblast':				
a	200	206	-	-
b	-	-	-	-
c	147	-	-	-

(continued)

Season and District	1901-1905	1906-1910	1901-1910	1909-1913
Average wages to male worker without horse on his own food in kopeks per day:				
Tobolsk gubernia:				
a	63	76	70	-
b	77	90	84	-
c	80	93	87	-
Tomsk gubernia:				
a	58	70	64	-
b	91	91	91	-
c	71	95	82	-
Yeniseysk gubernia:				
a	71	80	76	-
b	87	102	95	-
c	99	97	97	-
Akmolinsk oblast':				
a	65	68	67	-
b	91	89	90	-
c	82	84	83	-
Semipalatinsk oblast':				
a	-	68	-	-
b	-	86	-	-
c	-	88	-	-
Irkutsk gubernia:				
a	-	79	-	-
b	-	-	-	-
c	-	123	-	-
Zabaikal oblast':				
a	111	-	-	-
b	-	-	-	-
c	98	-	-	-

(continued)

Season and District	1901-1905	1906-1910	1901-1910	1909-1913
Average wages to male worker without horse on household food in kopeks per day:				
Tobolsk gubernia:				
a	48	55	52	62
b	61	68	65	64
c	61	74	68	69
Tomsk gubernia:				
a	47	54	51	56
b	55	69	62	74
c	48	93	71	75
Yeniseysk gubernia:				
a	52	56	54	55
b	44	73	58	68
c	73	78	76	71
Akmolinsk oblast':				
a	45	49	42	50
b	61	62	62	63
c	63	65	64	84
Semipalatinsk oblast':				
a	-	53	-	-
b	-	64	-	-
c	-	82	-	-
Irkutsk gubernia:				
a	70	68	69	63
b	-	75	-	66
c	85	88	87	82
Zabaikal oblast':				
a	72	62	67	-
b	-	-	-	-
c	69	-	-	-

(continued)

Season and District	1901-1905	1906-1910	1901-1910	1909-1913
Average wages to female worker on her own food in kopeks per day:				
Tobolsk gubernia:				
a	43	49	46	-
b	51	65	58	-
c	59	71	64	-
Tomsk gubernia:				
a	40	46	43	-
b	51	62	57	-
c	47	74	61	-
Yeniseysk gubernia:				
a	51	48	50	-
b	61	73	67	-
c	53	79	66	-
Akmolinsk oblast':				
a	42	44	43	-
b	50	55	53	-
c	60	58	59	-
Semipalatinsk oblast':				
a	-	53	53	-
b	-	61	61	-
c	-	70	70	-
Irkutsk gubernia:				
a	60	68	64	-
b	-	68	68	-
c	-	119	119	-
Zabaikal oblast':				
a	65	71	67	-
b	-	-	-	-
c	67	-	67	-

(continued)

Season and District	1901-1905	1906-1910	1901-1910	1909-1913
Average wages to a female worker on household food in kopeks per day:				
Tobolsk gubernia:				
a	28	36	32	-
b	39	47	43	-
c	45	58	52	-
Tomsk gubernia:				
a	32	33	33	-
b	35	51	43	-
c	36	60	48	-
Yeniseysk gubernia:				
a	41	38	40	-
b	48	56	52	-
c	60	66	63	-
Akmolinsk oblast':				
a	30	33	32	-
b	35	39	37	-
c	45	44	45	-
Semipalatinsk oblast':				
a	-	38	-	-
b	-	45	-	-
c	-	57	-	-
Irkutsk gubernia:				
a	-	41	-	-
b	-	47	-	-
c	-	63	-	-
Zabaikal oblast':				
a	48	43	-	-
b	-	-	-	-
c	56	-	-	-

Source: Sbornik Statistiko-Ekonomicheskikh Svedenii po Sel'skomu Khoziaistvu Rossii i Inostrannikh Gosudarstv, (Petersburg), Vol. V, 1911, p. 484-485; Vol. X, 1916, p. 530-532.

I chose to analyze the data using ordinary least squares regression. This involved regressing the wage level on sixteen dummy variables: one each for the seven gubernias and oblast's, one for each of the thress seasons, one for each of three periods, one representing workers with and without horses, one distinguishing male and female workers, and one distinguishing workers on household food from those who fed themselves.

No constant was included since it would only confuse the meanings of the other elements in the regression. The equation then had the following form:

WAGE = aTOBOLSK + bTOMSK + cYENISEYSK + dAKMOLINSK +
eSEMIPALATINSK + fIRKUTSK + g ZABAIKAL +
hSOWING SEASON + iHAYING SEASON + jHARVESTING SEASON
+ kHORSE + lMALE + mHOUSEHOLD FOOD + nPERIOD ONE
(1901-1905) + oPERIOD TWO (1906-1910) +
pPERIOD THREE (1910-1913).

In order to avoid multicollinearity, the following transformation was used on the dummy variables for time periods.

PERIOD THREE = 1 - PERIOD ONE - PERIOD TWO

WAGE = aTOBOLSK + ... + mHOUSEHOLD FOOD + nPERIOD ONE +
oPERIOD TWO + pPERIOD THREE

WAGE + p + aTOBOLSK + ... + mHOUSEHOLD FOOD +
(n-p)PERIOD ONE + (o-p)PERIOD TWO

The results of the regression are summarized in the table below.

Table 17: Results of Regression Based on Data in Table 16 Above

Variable	Coefficient	t-Statistic
TOBOLSK	-21.8760	6.33964
TOMSK	-23.3306	6.76116
YENISEYSK	-13.9973	4.05639
AKMOLINSK	-22.1791	6.42746
SEMIPALATINSK	-19.2866	4.66222
IRKUTSK	- 4.94670	1.28630
ZABAIKAL	0.00010	18.2344
SOWING SEASON	73.2838	15.3774
HAYING SEASON	82.9738	16.4808
HARVESTING SEASON	89.1071	18.2344
HORSE	73.2173	29.6327
MALE	22.1161	12.2122
HOUSEHOLD FOOD	-18.3640	10.0058
PERIOD ONE	- 9.42312	2.87752
PERIOD TWO	1.66411	0.513769
PERIOD THREE	0.09991	18.2344

R-Squared	0.9368
F-Statistic	189.252
Standard Error	10.5620

Agricultural Equipment in Siberia

Table 18: Agricultural Machines Per Peasant Household in European Russia and Siberia in 1910

Type of Machine	European Russia (50 gubernias)	Siberia	Tobolsk gubernia	Tomsk gubernia
Seeding	0.015	0.003	0.001	0.002
Reaping	0.040	0.053	0.067	0.042
Threshing	0.031	0.042	0.050	0.038
Winnowing	0.125	0.083	0.111	0.050
Hay-mowing	0.005	0.041	0.071	0.031
Total	0.216	0.222	0.300	0.163

Type of Machine	Yeniseysk gubernia	Irkutsk gubernia	Zabaikal oblast'	Amur oblast'
Seeding	0.005	0.001	0.000	0.062
Reaping	0.200	0.014	0.020	0.250
Threshing	0.200	0.040	0.010	0.077
Winnowing	0.500	0.100	0.048	0.250
Hay-mowing	0.143	0.017	0.031	0.083
Total	1.048	0.172	0.109	0.722

Source: Istoriia Sibiri s Drevneishikh Vremen do Nashikh Dnei, Vol. III, p. 200.

Table 19: Number of Agricultural Machines Per Peasant Household in Various Districts of Siberia in 1917

District	Number of Peasant Households	Number of Peasant Households With No Machinery or Improved Implements	Percentage of Peasant Households With No Machinery Or Improved Implements	Single-Plowshare Iron Plows
Akmolinsk Oblast'	115,131	18,346	15.9%	0.532
Tobolsk Gubernia	316,848	29,819	12.6%	0.570
Altai Gubernia	393,321	109,361	27.8%	0.551
Tomsk Gubernia	288,149	77,655	26.9%	0.582
Yeniseysk Gubernia	159,237	25,434	15.9%	0.706
Irkutsk Gubernia	78,716	18,857	24.0%	0.293
Total	1,351,402	289,472	21.4%	0.564

District	Multiple-Plowshare Iron Plows	Seeding Machines	Mowing Machines
Akmolinsk	0.124	0.118	0.160
Tobolsk	0.031	0.030	0.002
Altai	0.061	0.038	0.153
Tomsk	0.006	0.014	0.090
Yeniseysk	0.002	0.004	0.064
Irkutsk	0.024	0.005	0.015
Total	0.038	0.032	0.086

(continued)

District	Horse-Drawn Rakes	Reaping Machines	Binding Machines
Akmolinsk	0.156	-	0.015
Tobolsk	0.003	-	0.002
Altai	0.137	0.161	0.031
Tomsk	0.101	0.082	-
Yeniseysk	0.001	0.077	-
Irkutsk	0.010	0.018	-
Total	0.076	0.076	0.011

District	Threshing Machines	Winnowing Machines	Total Machines
Akmolinsk	0.058	0.168	1.331
Tobolsk	0.090	0.139	0.868
Altai	0.073	0.208	1.413
Tomsk	0.075	0.170	1.120
Yeniseysk	0.065	0.156	1.075
Irkutsk	0.044	0.120	0.529
Total	0.073	0.170	1.126

Source: Pogubernskie Itogi Vcerossiiskoi Sel'skokhozaiastvennoi i Pozemel'noi Perepisi 1917 g. po 52 Guberniam i Oblastiam, (Petersburg, 1917), p. 26, 34, 60, 61, 74, 75, 86, 87.

Table 20: Agricultural Equipment Per Peasant Household and Per Unit of Sown Area in European Russia and Western Siberia in 1917

Equipment	Pieces Per Household		Pieces Per 100 Desiatinas (270 acres) of Sown Area	
	European Russia	Western Siberia	European Russia	Western Siberia
Plow	0.500	0.500	10.2	10.59
Seeder	0.036	0.036	0.73	0.67
Mower*	0.13	0.045	0.80	2.12
Reaper	0.053	0.077	1.07	2.17
Thresher	0.036	0.077	0.73	1.29
Winnower	0.130	0.175	2.58	2.88

(*Footnote: Measured per 100 desiatinas of hayfields.)

Source: L.M. Goriushkin, Sotsial'no-Eknomicheskie Predposylki Sotsialisticheskoi Revoliutsii v Sibirskoi Derevnie, (Novsibirsk, 1962), P. 73.

Table 21: Distribution of Livestock Among Peasant Households Grouped by Area Sown in 87 Villages of Ishim Okrug of Tobolsk Gubernia in 1887

Area Sown in Acres	Total Households		Horses	
	Number	Percent	Average Per Household	Percent
0-2.7	1,171	14.0	0.6	2.7
2.7-5.4	1,768	21.4	1.4	9.6
5.4-13.5	2,273	27.6	2.6	23.1
13.5-29.7	2,206	26.7	4.3	38.0
29.7-48.6	599	7.3	6.0	16.7
48.6-81.0	219	2.7	9.8	8.5
over 81.0	24	0.3	14.8	1.4
over 0	8,260	100.0	3	100.0

Area Sown In Acres	Cows		Sheep	
	Average Per Household	Percent	Average Per Household	Percent
0-2.7	0.6	3.9	0.8	1.3
2.7-5.4	0.9	10.0	2.3	5.7
5.4-13.5	1.6	21.9	6.3	20.3
13.5-29.7	2.7	36.9	13.5	41.9
29.7-48.6	4.6	16.9	22.6	19.1
48.6-81.0	6.8	9.0	32.8	10.1
over 81.0	9.9	1.4	45.9	1.6
over 0	2	100.0	8.6	100.0

Source: L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p. 87.

Table 22: Distribution of Improved Machinery Among Peasant Households Grouped by Area Sown in Barnaul Volost' of Tomsk Gubernia in 1905

Area Sown in Acres	Total Households		Plows	
	Number	Percent	Number	Percent
0-10.8	2,894	47.0	509	15.6
10.8-27.0	2,215	26.7	1,058	51.0
over 27.0	984	16.3	1,082	33.4
over 0	6,093	100.0	2,649	100.0

Area Sown In Acres	Plows Per 100 Households	Harvesting Machines		
		Number	Percent	Per 100 Households
0-10.8	17.6	18	3.2	0.6
10.8-27.0	47.7	60	11.4	2.7
over 27.0	110.0	446	85.4	44.3
over 0	43.4	524	100.0	8.6

Area Sown in Acres	Threshing Machines		
	Number	Percent	Per 100 Households
0-10.8	13	3.7	0.4
10.8-27.0	74	21.0	3.3
over 27.0	266	75.3	27.0
over 0	353	100.0	5.8

Source: L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p. 118; Predposylki Oktiabrskoi Revoliutsii v Sibiri. Materiali po Istorii Sibiri: Sibir'Perioda Kapitalizma. Vipusk 1, (Novosibirsk, 1964), p. 96.

Table 23: Facts About Peasant Households of Barnaul Uezd of Tomsk Gubernia in 1910

Area Sown in Acres	Number of Households Studied	Percent With No Horses	Percent With No Cows	Percent With No Livestock
0	472	48.6	34.1	20.7
0-5.4	1,215	20.2	12.1	4.4
5.4-10.8	1,304	5.4	5.0	0.4
10.8-27.0	2,090	0.6	2.2	0.1
27.0-43.2	710	-	1.0	-
over 43.2	528	-	-	-
0 or more	6,319	9.2	6.6	2.8

Area Sown In Acres	Percent With No Agricultural Inventory	Percent Practicing Crafts	Harvesting Machines per 100 Households
0	98.7	43.4	0.1
0-5.4	96.1	20.4	1.6
5.4-10.8	83.2	10.4	7.0
10.8-27.0	52.0	7.0	36
27.0-43.2	17.0	8.0	85
over 43.2	6.0	7.0	110
0 or more	52.0	13.6	34

Source: L.M. Goriushkin, Sibirskoe Krest'ianstvo Na Rubezhie Dvukh Vekov: Konets XIX-Nachalo XX, (Novosibirsk, 1967), p. 286.

Table 24: Distribution of Livestock Among Peasant Households Grouped by Sown Area and Region of Settlement

Sown Area in Acres	Number of Households		Number of Working Stock (Horses and Oxen)	
	Total	Percent of Total	Total	Percent of total
0-2.7	4,738	16.0	4,701	6.5
2.7-8.1	8,906	30.1	12,854	18.0
8.1-24.3	11,586	39.1	30,843	43.1
over 24.3	4,389	14.8	23,329	32.4
0 or more	29,619	100.0	71,727	100.0

Sown Area in Acres	Number of Cows		Average No. of Livestock Per Household Steppe Region of Akmolinsk Oblast' and Yeniseysk Gubernia	
	Total	Percent of Total	Working Stock	Cows
0-2.7	5,045	8.1	1.0	0.6
2.7-8.1	13,569	21.5	1.6	1.0
8.1-24.3	27,520	43.6	3.0	1.7
over 24.3	16,877	26.8	6.3	3.2
0 or more	63,011	100.0		

Sown Area in Acres	Average Number of Livestock Per Household			
	Barabinsk Steppe of Tomsk Gubernia		Wooded Steppe of Akmolinsk Oblast' and Tobolsk Gubernia	
	Working Stock	Cows	Working Stock	Cows
0-2.7	1.9	3.0	0.9	1.1
2.7-8.1	2.3	3.5	1.3	1.5
8.1-24.3	3.3	5.1	2.4	2.4
over 24.3	5.5	8.2	4.7	3.8

(continued)

Sown Area in Acres	Average Number of Livestock Per Household Wooded Steppe of Yeniseysk and Irkutsk Gubernias		Forest Areas of Tobolsk and Irkutsk Gubernias	
	Working Stock	Cows	Working Stock	Cows
0-2.7	0.8	0.7	0.8	1.0
2.7-8.1	1.5	1.1	1.2	1.5
8.1-24.3	2.4	1.6	2.0	2.6
over 24.3	4.3	3.6	4.8	6.0

Sown Area in Acres	Average Number of Livestock Per Household in All Regions	
	Working Stock	Cows
0-2.7	1.1	1.2
2.7-8.1	1.6	1.7
8.1-24.3	2.6	2.7
over 24.3	5.1	5.0

Source: L.F. Skliarov, Pereselenie i Zemleustroistvo v Sibiri v Gody Stolypinskoi Agrarnoi Reformy, (Leningrad, 1962), p. 390-391; V.K. Kuznetsov, Sbornik Statisticheskikh Svedenii ob Ekonomicheskom Polozhenii Pereselentsev v Sibiri, (Petersburg, 1912), Part I, p. 67; V. Ia. Nagnibed, Sbornik Statisticheskikh Svedenii ob Ekonomicheskom Polozhenii Pereselentsev v Tomskoi Gubernii, (Tomsk, 1913), Part I, p. 218-219.

X. Summary of Conclusions

The previous chapters have established the following picture of Siberian agricultural development between 1890 and 1917. There was a very impressive growth in the output of Siberia's three chief agricultural products: butter, meat, and grain. This expansion was naturally accompanied by an equally impressive increase of all three agricultural inputs: land, labor, and machinery and animals. The most important natural factors affecting the character and extent of Siberian agriculture were climate and distance. Both these factors tended to foster the concentration of agricultural activity in the southern portions of Western Siberia. However, the soil and climatic conditions in the agricultural areas of Siberia were similar to those in agricultural areas of European Russia at similar latitudes, so seed types used in European Russia usually adapted to Siberian consitions reasonably well. There was also a number of human exogenous factors whoch were of vital importance to Siberian agricultural development: the great Siberian migration, which was motivated largely by peasant desire both for more land and religious and political freedom; the social institution of the mir or peasant commune, which provided the basis for both the peasant land tenure system and butter-making cooperatives; and the absence of a landed gentry and a serf tradition, which was an important factor in favor of social and economic mobility in

Siberia. A number of technical innovations and accomplishments also contributed to agricultural expansion. The construction of the Trans-Siberian Railway itself was the most important of these accomplishments. Also deserving special mention are the refrigerator car, the mechanical separator used in butter-making, the use of butter-making waste to fatten hogs, and new agricultural machinery and factory-machined metal parts and implements.

It was against this background that government policy and peasant response to the incentives of the marketplace acted out their respective roles in the agricultural development of Siberia. The relative importance of these two factors in this development has emerged as the central question in this work.

As noted in Chapter VIII, Section D, most of the policies of the Tsarist government had a positive effect on Siberian agricultural development. The construction of the Trans-Siberian Railway along the southern border of Siberia was absolutely necessary for the growth of agriculture in the region. Gobernment policies concerning migration and settlement were either moderately beneficial or ineffective. Government loans and tax exemptions for individual new-settler households, although not crucial, were important to the economic survival of some marginal households. Of much greater value to the new-settlers were

the five-year draft exemption and the provision of free land allotments from the immigrant land fund. One of the most successful of the government's development efforts was its opening up of Siberia to the importation and sale of modern agricultural machinery and equipment. This was accomplished through the retail outlets and credit provided by the Migration Administration. Even two otherwise unsavory policies had favorable effects on agricultural development. The exile system provided settlers for otherwise neglected areas of Siberia and increased the size of the agricultural proletariat in the tight Siberian agricultural labor market. The requisition of native lands for the immigrant land fund forced the native tribes of Siberia to give up their nomadic ways, settle down, and adopt agriculture if they were to survive.

Other policies of the Tsarist government had very little effect. Peasant movements both to and within Siberia were not amenable to government attempts at conrol. Peasants moved where they pleased when they pleased and ignored government decrees and regulations concerning migration. The Stolypin land reform, which was intended to move peasant households out of the mir and onto their own privately-owned holdings, also met with very little success in Siberia. Both these policies failed largely because they contradicted the wishes of the peasantry. Even the collection of direct taxes from the Siberian peasantry was

not completely successful since the government could not keep track of all the peasants in the vast expanse of Siberia. In contrast, government technical assistance to agriculture was ineffective not because the peasants were not interested but because the assistance offered was not on a sufficiently large scale to make much of a difference. There was also the problem that most trained agronomists came to Siberia from European Russia, so they were largely unfamiliar with the special conditions affecting Siberian agriculture.

There were only two government policies which had a negative effect on Siberian agricultural development. The first was the 40.5 acres per male norm and the shaving of old-settler allotments which accompained the attempted imposition of this norm. The term "attempted" is quite appropriate since there were many households which exceeded this norm. The practical results of this policy were uncertainty within the peasant land tenure system and serious abuse of the State's right of eminent domain as good peasant land wound up permanently in State or Kabinet holdings. On the other hand, this policy was a means of stocking the immigrant land fund. The aim of transferring little-used old-settler land into the immigrant land fund was certainly not antithetical to Siberian agricultural development, but the rigidity of the 40.5 acres (or less) per male norm and the abuse and uncertainty which accompanied the transfer

sometimes seriously hindered old-settler and native agriculture.

The second of these negative government policies was the Cheliabinsk freight rate barrier against the export of Siberian grain to European Russia, which was not completely removed until 1913. It was intended to impede the competition of Siberian grain exports with the grain produced on the estates in European Russia. This is the only instance I have found in which the government responded to pressure to hinder Siberian agricultural growth. Grain composed only 23% of Siberian agricultural exports by value in 1913.[1]

The general conclusions to be drawn concerning the effects of government policies on Siberian agriculture are as follows: (1) Tsarist government policies with two exceptions were either beneficial or ineffective in their effects on Siberian agriculture. (2) Attempts at regulation were not completely effective unless they were based on government control of the railroad. The government could control what or who was carried and at what charge (but not always where they got off). If the peasants chose to ignore a regulation, there was usually very little the government could do about it. (3) Government policies, even if not of a regulatory nature, required the support or at least the acquiescence of the peasantry to be success-

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[1]See Table III.1 in Chapter III.

ful. (4) The result of (2) and (3) was that the Tsarist government had only imperfect and limited control over Siberian agriculture while the peasantry made most of the important economic decisions themselves.

The Siberian peasantry apparently exploited their microeconomic control over the agricultural sector apparently to the fullest possible extent and missed few opportunities -- if any. Agricultural production and exports expanded very rapidly. Such an expansion would have been impossible without an ambitious and highly competent peasantry. Individual peasants moved to Siberia, set up their households, worked virgin land, maintained themselves as hired laborers, saved from their incomes to purchase equipment and animals, and usually became independent farmers. They also experimented with different systems of field use and crop rotation and apparently were very flexible in adopting both new techniques and advanced equipment. But the competence of the Siberian peasantry went far beyond the individual level.

Out of the mir frew the butter-making and consumer cooperatives which allowed the peasants to exploit the economies of scale in butter-making and to purchase manufactured products in large orders. There were also very active peasant markets for hired labor, the rental sale of land, and the rental of agricultural machinery and equipment, so factor allocation was fluid and apparently

economically efficient. The Siberian peasantry were able to do even more than this, however. They instituted and maintained a land tenure system, allocated their own direct tax burden, had a primitive local social insurance scheme, and protected themselves from the machinations of government officials all through the mir.

The peasantry of Siberia were definitely not passive or bound by outmoded traditions. They were active and effective proponents of their own prosperity and well-being and, to this end, of Siberian agricultural development. They also displayed a vigorous entrepreneurial capacity. The accomplishments of the Siberian peasantry even suggest that the agricultural problems of European Russia may not have been the fault of a backward peasantry or even of the mir but rather of other factors such as the landed gentry or the oppressive policies of the Tsarist government. There can be no doubt that the impressive growth of Siberian agriculture was largely the product of peasant enterprise. The Tsarist government performed only a limited number of essential functions. Without the Trans-Siberian Railway, export of Siberian agricultural products at reasonable cost would have been impossible. The Migration Administration was instrumental in speeding the importation and sale of modern agricultural equipment in Siberia. In fact, private dealers sold no agricultural equipment in Siberia

until 1902.[2] Finally, government surveying was important in providing free land allotments for new-settlers. However, if the peasants themselves might have managed to supply land for new-settlers, then the chief result of the government's efforts in stocking the immigrant land fund was only to transfer wealth in the form of land from old-settlers to new-settlers.

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[2]See Table 5 of the Appendix to Chapter VIII.

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