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THE SOCIALIZED AGRICULTURE OF THE USSR
PLANS AND PERFORMANCE

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THE SOCIALIZED AGRICULTURE OF THE USSR

PLANS AND PERFORMANCE

By

NAUM JASNY



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DEDICATED

TO

those in Soviet Russia—far away and yet so near—who believe in science, unadorned and unadulterated science; statistics, simply factual statistics; plain truth, untarnished and unvarnished.

DIRECTOR'S PREFACE

How does a socialized agriculture work? What of its organization, controls, output, labor productivity, and product distribution? The time is not ripe for any general or definitive answer to these imperious questions, but Soviet experience affords a challenging opportunity to dig out partial and tentative answers relating specifically to that experience.

Typically glowing accounts by Soviet spokesmen are punctuated from time to time by wholesale charges and occasional purges, as in 1946. From visiting journalists, other foreign visitors, and recent emigrés come widely divergent answers. Initial prejudices, partisanship, differences in range of observations, and variations in degrees of credulity and competence help to account for such divergences. The subject demands skillful and intensive research, with the maximum use of the considerable though inadequate information that Soviet policy permits, sometimes unwittingly, to become available to the public at home and abroad. It is this kind of research that is embodied in the present work.

The writer of this book lived in Russia until after the Bolshevik Revolution. In World War I he worked on food problems as a member of the staff of the Economics Division of the All-Russian Union of Cities. Under the Kerensky regime of February–October 1917 he was an associate member of the Supreme Food Council and one of the advisers of the Supreme Economic Council. Later he served the Soviet government in Western Europe as a grain expert in trade representations in Germany. To the official *Encyclopedia of Russian Exports* (published in Russian, Berlin, 1st ed., 1926, 2d ed., 1928) he contributed the long section on "Grain," writing most of it and editing the rest.

During the last few years of his residence in Germany, he served as a foreign correspondent of the Food Research Institute, preparing memoranda on grain developments in Germany and the USSR. Since he came to the United States in 1933, he has written for the Institute two issues of *Wheat Studies*—

"Wheat Problems and Policies in Germany" (November 1936), and "Wheat Prices and Milling Costs in Classical Rome" (March 1944)—and one book, *Competition among Grains* (January 1940). He has also made important contributions to the study of tractors and, more recently, to the understanding of wheat, flour, and bread in classical antiquity. In our judgment, based on an association covering about twenty years, he is a thorough, ingenious, and trustworthy scholar.

The Institute has done its utmost to facilitate his completion of this extraordinarily difficult task. As the writer himself brings out in his Introduction, it is too much to expect that anyone, anywhere, can present a perfectly true picture of the evolution and results of the Soviet agricultural system. Some errors of fact and interpretation are inevitable in such a work, and we hope that subsequent research will correct any that the book contains. Yet we are satisfied that it constitutes a major contribution toward reliable understanding of a highly important subject that has been obscure and confused.

In the production of this book the Institute has been significantly aided by grants from the Rockefeller Foundation.

J. S. DAVIS

July 1949

ACKNOWLEDGMENTS

When this study reaches the reader, the necessity of thorough research on the Soviet economy will not need emphasis. It was different early in 1946 when the Food Research Institute decided to help me to go on with the project. A share of any credit that may be forthcoming goes to the Institute and its Executive Director, Dr. M. K. Bennett.

Mr. P. Stanley King, of the Institute, did a big job on the study, going over the whole manuscript thoroughly and checking computations, the argument, and so on. Much of the final wording is his. The charts and maps are entirely his work.

The manuscript, when first submitted, consisted of two parts. At the suggestion of Dr. J. S. Davis, the material was rearranged into five parts. Many other improvements were made as a result of his scrutiny.

Dr. V. P. Timoshenko, who is in the first rank among students of Russian and Soviet agriculture, took pains to read the study from beginning to end. No manuscript could fail to profit substantially from the suggestions of such an expert.

This study, like most of my others, is based primarily on material in the library of the United States Department of Agriculture. But it is not the books used there that one recalls after the burdensome job is done. It is the friendly atmosphere of the place. Names cannot be given; there are too many. But everywhere—in the reading room, in circulation, in the catalogue section—everybody is helpful, and helpful in such a way that it is pure pleasure to go there, to be there.

N. J.

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THE SOCIALIZED AGRICULTURE OF THE USSR

CHAPTER I

INTRODUCTION

The socialization of Russian agriculture is a unique phenomenon. The huge size of the country and the brief span of time in which its agriculture was socialized make the experience peculiarly intriguing to study. By and large over the world, the family-operated general farm has proved the most economic form of agricultural production. Yet thousands of large state-owned farms, the sovkhozy, were brought into existence in the USSR. Initially operated on a factory-like basis for the production of single commodities such as wheat, cattle, or hogs, they still preserve this character to a large extent. Outside the USSR, furthermore, attempts to combine small farms into large-scale *production* co-operatives have thus far proved even less successful than have the efforts of the large farms to resist the encroachment of the family farm. Yet almost overnight in the Soviet Union some 20 million small family farms were merged into approximately 200,000 large collective farms, the kolkhozy.

Those 20 million peasant households, poorly supplied with the means of production and with technical knowledge, were certainly a weak sector of an economy striving for rapid advancement. There is no question that improvement was needed. But was the chosen method—that of replacing the backward peasant farming system by state and collective farms—superior to the customary one, by which the farmers would have been provided with an abundance of technical information, credit to acquire the means of production at low prices, and, most important, a rapidly expanding market for their produce at favorable prices?

AIMS OF THIS STUDY

When the present study was started early in 1945, the writer cherished the hope of contributing toward an answer to the question of the relative advantages of large-scale state and col-

lectivized peasant farming. So far as concerns collectivized farming, however, the hope dwindled as his researches gradually clarified the picture. Collective farming was introduced and has developed under such adverse conditions in the Soviet Union that it would have failed even if it were, per se, a perfectly sound undertaking. The only conclusion that can be reached on the basis of Soviet experience is that collectivization of agriculture should never be attempted by the methods resorted to in the USSR.

Excessive speed in collectivizing, and state appropriation of a large part of the kolkhoz (collective) output at inadequate prices, were the two principal factors that prevented the Soviet experiment in collectivization from constituting a fair trial. The adverse effects of the first of these had been largely, though not fully, overcome by the end of the 'thirties. The second handicap, however, has persisted; indeed, its detrimental effects increased as the state's grip on the operations and output of the kolkhozy was strengthened. As for the sovkhozy, only the undue haste with which they were established hampered their development. They were given every opportunity to eliminate the resulting weaknesses, but in vain.

If the purpose of the study were only to appraise the results of the operations of state and collective farms as an experiment in socialization of agriculture, a great deal of space would have to be devoted to the state farms. Actually, analysis is focused primarily upon the kolkhozy. The major purpose of this study is not to discuss the more or less theoretical question of the superiority of socialized agriculture, but to analyze the development of Soviet agriculture as a very important link in the national economy, indeed as the foundation on which industrialization at previously unheard of rates was and is being based. Since the sovkhozy were relegated to a secondary role in Soviet agriculture a few years after the start of the socialization drive, space could be saved by dealing cursorily with them.

In spite of the rapid expansion of industry and of the urban sector, almost two-thirds of the population is still rural in the USSR. Soviet industry reveals no great ability to sell its products competitively in foreign markets. The USSR has to

depend entirely on its agriculture for all food and for practically all industrial raw materials of agricultural origin. Soviet agriculture still is and will continue to be, at least for a considerable time, the foundation of the country's economic structure. The success of her huge reconstruction drive will depend to a large extent on the results of the reconstruction of agriculture. Should the agricultural foundation fail, the industrial superstructure, however sturdy in itself, will fall with it.

The larger purpose of this study is to provide a careful analysis of Soviet agriculture, especially during and since the socialization drive, as a major component of the Soviet economy. Such an analysis is urgently needed, now that the USSR is playing so important a role in world affairs. Additional importance attaches to the analysis because of the widening of the area over which the socialization of agriculture is being undertaken. That state and collectivized farming will be adopted in the Baltic states and in other recently acquired territories is a foregone conclusion. But collectivized farming has even become an export commodity and is being transplanted farther west into the zone of Soviet special interests.

THE APPROACH

Much has been written on the great Soviet reorganization drive in general and the collectivization of peasant farming in particular. The appraisals range from enthusiastic acclaim to prophecies of complete failure, with extreme views greatly predominating. The present writer cannot deny having an appraisal of his own, but this study has not been prepared to expound that appraisal. Rather, its purpose is to give the reader an opportunity to form his own opinion. To do this intelligently, one needs all the relevant facts and figures—particularly figures critically examined and sifted. It is these facts and figures that the writer has done his utmost to bring together.

Ideas and philosophies played an important role in the post-1917 reorganization of Russian agriculture. The Russian peasant's concept—that the land is God's, and that only those who are willing to work it with their own hands and who need its yield should be permitted possession of it—was decisive in the

agrarian revolution of 1917, has influenced the peasant's behavior ever since, and will do so for a long time to come. In a similar way, the establishment of large-scale state farms and the collectivization of peasant farming were undoubtedly the outgrowth of the Marxian idea that large-scale farming is much superior to small-scale farming, just as large-scale industry is superior to small-scale industry. This is an idea to which communists of all shades and, indeed, many socialists continue to adhere firmly. Philosophies pertaining to or involving agriculture played a great role also in the intra-party struggles, between the Stalinists on the one hand and the Trotskyites and the right wing on the other. The outcome of these is clearly reflected in the government's actions, especially in the pre-collectivization and early collectivization periods.

Despite the importance of the various philosophies, little space is devoted to them in this study. The intra-party fights are almost entirely ignored. Whatever may have been the guiding principles, the results have either justified them or proved them false. The writer is primarily interested in these results.

HANDICAPS

Many obstacles lie in the path of the investigator of the general reorganization drive and the socialization drive in agriculture. The first difficulty arises from the abnormal conditions under which the drives proceeded. Intentional concealment of information and distortion of basic statistics further handicap the researcher.

Violent and confused changes.—The great expansion of state farming in the late 1920's, and especially the collectivization drive of 1928–32, constituted nothing short of a terrific avalanche. The establishment and operation of the sovkhozy suffered heavily from the lack of such elementary knowledge among their officials as the fact that a cow or a sow has to be bred and fed. The kolkhozy were similarly handicapped, but other difficulties hampered their progress even more. Not only were the peasants forced into the kolkhozy, but this was done in a very unjust and, in the final analysis, uneconomical way. Although the kolkhozy were not intended to serve the interests of the collectivized peasantry, the unfortunate members of the

new collective farms were called upon to surrender, along with their other capital goods, all their workstock and a large portion of their productive livestock. Rather than comply, the peasants sold, consumed, or destroyed the livestock, even their horses, which, in the Soviet Union as a whole, declined from 33.5 million in 1928 to 16.6 million in 1933. Very little mechanical power could be procured in such a short time. Thus, instead of being based on mechanical power, as was the design, the collectivized economy suffered for years from a very inadequate supply of any draft power.

For years the collectivization drive was conducted without any plan, even without a clear idea as to how the work in the collectives should be organized. Individual responsibility of each member for assigned work, and organization of small squads for performance of specific operations or for care of a specified number of livestock, are now the basic principles of labor organization in the kolkhozy. These principles, however, were only gradually translated into practice, and were not in universal operation until after nearly every peasant had become a kolkhoz member. The squads, as one of the standard forms of labor organization in collective (and state) farms, were not established until 1939. In the beginning the kolkhozniki (collectivized peasants and their families) were nothing but a huge herd; most of their leaders were inexperienced, and many were drawn from the ranks of city workers.

The soil was so poorly cultivated in the first years of the collectivization drive that weed infestation became a critical problem. This drawback was not fully eliminated when war came in 1941. In certain important areas, moreover, the great depletion of livestock herds was not made up until then.

By 1939 the early effects of the manner in which the collectives were brought into being had not been fully overcome, and such advantages as collectivization might offer had not been fully displayed. In a similar way the negative features inherent in collective farming, as organized in the Soviet Union, had not reached full strength. In other words, the grand project had not come to fruition. While the Soviet Union was not actively involved in war until mid-1941, the fulfillment of the 3d Five-Year Plan (1938–42) was to some extent affected by the speed-

ing up of war preparations after mid-1939. Because of the vast war destruction, abnormal conditions may now be expected to prevail for a number of years. Socialized farming and its results must therefore be analyzed in a state of movement, indeed, of rapid change. This alone would have made the task difficult even if reliable, unbiased statistics were at hand.

The blackout.—Surprising as it may seem, old Russia might have been proud of her agricultural statistics. Statistical work indeed flourished in Czarist times—to a very small extent in central-government institutions, but mainly in the statistical organizations of the zemstva, the elected governments of the gubernii or provinces. The ablest of the Russian intelligentsia, deprived by the Czarist regime of the opportunity to participate in the political life of the country, sought refuge in these statistical organizations. Zemstvo statistics were almost exclusively agricultural, or at least rural. The zemstva had their own crop data, which differed considerably from one set of official statistics (see pages 725–27). Surveys of all phases of peasant life were started by the zemstvo statisticians in the 1880's, and thereafter were conducted regularly on a large scale.[1] A feature of these surveys, of particular significance for this study, was that they included data on consumption, though generally of grain only. With the help of these consumption data, rough grain balances were made up which served as forecasts of probable surpluses and deficits in specific areas, as well as checks on the production statistics.

The Revolution permitted the zemstvo statisticians to expand their activities to a country-wide basis. To name only a few, P. I. Popov, chief statistician of the Tula zemstvo, became chief of the Central Statistical Board; V. G. Groman, chief statistician of the Ryazan zemstvo, became chief economist of the Gosplan; and N. D. Kondratiev, staff member of the economics section of the Union of Zemstva who is internationally known for his work on "long cycles," became chief of the Institute of Business Research.

The period 1921–29 was indeed the golden age of Soviet

[1] E. S. and W. S. Woytinsky, "Progress of Agricultural Statistics in the World," *Journal of Farm Economics*, November 1939, XXI, 777–78.

statistics. The three-volume publication of the Gosplan on the 1st Plan, and the *Statistical Handbook, USSR, 1928*, a product of the Central Statistical Board, are great statistical achievements. One experiences no difficulty whatsoever in gathering and using the statistical material of that period, or even in criticizing it since the degree of reliability of the data is made clear and the method of arriving at conclusions is usually explained in detail.

Hardly an issue of an American daily paper appears without mention of the "iron curtain." It is not generally realized, however, that the Soviet iron curtain was created about two decades ago. It has been used not only to black out the Soviet Union from the foreigner, but to black out all the world including the USSR from Soviet citizens. The only difference between the Soviet people and foreigners in getting information on conditions in the USSR is that the outsiders are expected to swallow even more misinformation than those on the spot, who are believed capable of absorbing it in large doses. The intensity of the blackout of the Soviet Union from the foreigner has a full-fledged parallel in the blackout of foreign countries from the Soviet people.

In the short period between 1929 and 1937 the statistical work in the USSR was repeatedly subjected to more or less fundamental reorganizations, accompanied by thoroughgoing shakeups of personnel. "Neutral" statistics, i.e., statistics of the usual type which present nothing but facts, were officially replaced by "Marxian" or "class statistics." Instead of performing the function of statistics in nontotalitarian countries, Soviet statistics have been assigned the job of aiding in the "socialist construction."

The first step toward this end is the withholding of information. The publication of price indexes was discontinued after April 1930. *Socialist Construction USSR, 1936*, the statistical yearbook, does not contain the word "prices" in its index; its only item on prices is a table (p. 627) showing "the decline of retail prices [of many foodstuffs and six other consumer goods] in the state and co-operative trade in 1935" in percentages; the prices from which the percentages had been computed

are not given. No price data are given in *Socialist Construction USSR, 1933–38*, the last available statistical yearbook, nor in *Socialist Agriculture USSR, 1938*, nor for that matter, in its predecessor, *Agriculture USSR, 1935*. The publication of statistics of births and deaths was discontinued even before the price statistics. The data on the population census of 1939 were released in such abbreviated form that they give no answer to the simple question: How many persons were engaged in agriculture in that year?

Distortions.—But the help of statistics to socialist construction of the Soviet economy is not limited to omissions and concealment. One of their most important roles is to demonstrate the great successes of that economy. Since 1938, tables in Soviet statistical publications have displayed "leaders" that point out the conclusions to be drawn from the data. Two examples of tables with leaders, taken from *Socialist Agriculture USSR, 1938*, are shown on the following page. Of the 151 tables in this publication, no less than 38 have such leaders. Sixteen of these are quotations from Stalin, six from Molotov, and two from Lenin.

Much more important than this obvious device, however, is the deliberate selection of unrepresentative, manipulated, or inaccurate data to present a favorable picture. The grain production estimate for 1913 in the lower table, for example, had long been recognized as an understatement. On the other hand, the estimate for 1937, which is in "biological crop" terms, overstates the "barn crop" by about 25 percent (see discussion on pp. 548–49, 728 ff., and 740–42). Only about one-fifth of the 50 percent increase from 1913 to 1937, claimed in the leader, remains after both estimates have been adjusted to be comparable. Otherwise it would not be possible to account for the fact that, in the last years before World War I, Russia exported about one-eighth of her grain output, while in the late 1930's the USSR could not provide enough white bread for her own population. In the upper table, the non-comparable crop statistics of 1913, 1928, and 1937 are also used without any adjustments. The success of the project was by no means as unqualified as claimed in the leader to the table (see p. 722).

REPRODUCTION OF PAGE 60 OF *SOCIALIST AGRICULTURE USSR, 1938*, THE OFFICIAL STATISTICAL HANDBOOK, WITH TRANSLATED TEXTS

Socialist Agriculture successfully solved the problem of creating a new wheat base in the non-Chernozem zone.

TABLE 70

WHEAT PRODUCTION IN THE NON-CHERNOZEM ZONE

	Unit	1913	1928	1937
Acreage	1,000 hectares	321.3	344.9	2,730.0
Of this:				
Winter	1,000 hectares	63.9	106.2	1,050.5
Spring	1,000 hectares	257.4	238.7	1,679.5
Yield				
Winter	Quintals per hectare	11.1	11.0	13.3
Spring	Quintals per hectare	7.6	8.1	9.4
Output	1,000 quintals	2,644	3,104	29,775
Share in the output				
In the wheat output of the Union	Percent	1.0	1.2	6.6
In the grain output of the Non-Chernozem zone	Percent	1.7	1.9	13.9

At the end of the 2d Five-Year Period the output of grains exceeded the output in the best crop year of Czarist Russia by 2,453 million poods.

TABLE 71

COMPOSITION OF GRAIN PRODUCTION IN 1913 AND 1937

	1913		1937		1937 in percent of 1913
	Million quintals	Percent of total	Million quintals	Percent of total	
All grains	801.0	100	1,202.9	100	150.2
Of this:					
Wheat	262.0	32.7	468.6	39.0	178.9
Rye	213.3	26.6	294.4	24.5	138.0
Barley	107.9	13.5	106.0	8.8	98.2
Oats	154.1	19.2	218.6	18.2	141.8
Buckwheat	10.5	1.3	13.6	1.1	128.8
Millet	26.2	3.3	25.3	2.1	96.5
Corn	11.8	1.5	38.9	3.2	330.3
Dry legumes	8.9	1.1	22.7	1.9	254.6
Rice	3.4	0.4	3.8	0.3	112.8

It is interesting to note that the leader to the lower table makes a point of the fact that 1913 was the best crop year in Czarist times. It neglected to mention that 1937 was the most favorable year on record in the USSR. Statistics for 1937 are still widely used to show the achievements in agricultural output, productivity per man, distributions to kolkhoz members, and other matters; yet one wastes his time searching for similar data for either 1936, 1938, or any later year.

A favorite means of indicating success is to use an exceptionally poor year as a starting point for comparisons. The succeeding increases are naturally large, frequently overwhelming—on a percentage basis. As a result of the collectivization drive, almost half of the livestock disappeared between 1929 and 1933. Yet this very disaster must help prove the great achievements of socialized agriculture. A widely used comparison shows the growth of livestock herds in the USSR and in capitalistic countries from 1933 to 1938, although by 1938 the Soviet herds had made inadequate recovery from the post-collectivization low.[2]

This and a great number of similar "analyses" are unfair tricks, but the data used in them may be correct, as in the case of the livestock. However, Soviet statistics are not content to misuse correct data. So far as this study is concerned, the most disturbing innovation is the so-called "biological-yield" method of estimating crops (see pp. 728 ff.). Since 1933 it has applied to grain, and since 1940 to all crops. The biological yields are determined, as final, in the field some time before harvest. It is officially stressed that they must include quantities later lost, e.g., left on or in the ground or buried in the snow. Such a procedure obviously gives higher figures (by about 25 percent for grain in 1933–39) than would the old method, which aimed at determining only quantities harvested. Although the records of state and collective farms provide Soviet officials with much closer approximations to actual quantities harvested than are obtainable in most other countries, these data

[2] See, for example, *Socialist Agriculture USSR, 1938*, Gosplan (Moscow, 1939), Table 88, p. 72, in which the average increases in Soviet herds between 1933 and 1938 are compared with those in the United States and Germany in the same years, and with those in Czarist Russia from 1908 to 1913.

are not released.[3] By the order of the government and Party of December 6, 1942, it was forbidden to collect data on the quantity of grain actually threshed "as distorting the picture of actual condition of the crop."[4]

The merits or demerits of the new system of estimating crops are irrelevant at the moment. It is relevant, however, to observe that the official estimates which include unharvested portions of the crops are time and again compared, without the slightest adjustments, with official estimates for years when only the harvested portions were included. These comparisons are used to show the great superiority of socialized agriculture over the old Russian system (see reproduction of Table 71 from *Socialist Agriculture USSR, 1938*, on p. 11). In a similar manner, comparisons of unadjusted biological yields in the USSR with actual yields in foreign countries are made to demonstrate the superiority of the Soviet socialized agriculture over agriculture in capitalist countries.

It will be shown in chapter xxviii (p. 670) that the value of the output of feed, used in the computations of the value of total agricultural production, income from agriculture, and total national income, is determined in an entirely arbitrary manner without any accompanying explanations. Of more interest, however, is the fact that after having overestimated the value of feed produced in the later years, the statisticians failed to deduct those values in full in the computation of income from agriculture (pages 676–80). In a similar manner, the value of the investment in agriculture is greatly overstated (Appendix Notes B and C), but in the computation of income from agriculture no adequate allowance is made for depreciation of the investment, even on the basis of a correct appraisal.

A recent illustration of the unreliability of Soviet information may be cited. A report by the Technical Committee on Agricultural Production, submitted to the United Nations Interim Commission on Food and Agriculture on February 7, 1945, contained the following statement: "By contrast, in the United

[3] In *Socialist Agriculture*, December 1939, p. 61, A. Arina said: "We have the data for 238,817 kolkhozy, i.e., 99.1 percent of the total."

[4] S. V. Sholts, *Course of Agricultural Statistics* (Moscow, 1945), p. 37.

Kingdom, North America and unoccupied parts of the Soviet Union [agricultural] production was greatly expanded [during the war]."[5] That by "greatly expanded" the Committee meant something really exceptional is obvious from the statement on the following page: "Elsewhere in the world changes in volume of production were less considerable." Yet the present writer, after having completed this extensive study, is certain that the agricultural production of the unoccupied part of the Soviet Union *declined considerably* during the war. He is only unable to say by how much it declined. It is definitely known that vegetables are the only farm product which may have shown an increase. Output of all other products went down; that of cotton, flax, hemp, all livestock products, and even wheat declined sharply during the war. Total agricultural production of the unoccupied zone fell by more than 30 percent, possibly by more than 35 percent.

One can better understand why the Soviet members of the Committee acted as they did if he familiarizes himself with what is expected of Soviet agricultural economists. At about the time the Technical Committee was working in Washington, a Special Committee in the USSR was assigned the task of preparing a program for a course in farm economics which, when prepared, was duly approved by a competent government agency. I. Laptev, one of the most influential agricultural writers in the USSR, thus commented upon it in an article entitled "Lenin-Stalin on Agricultural Science":

> In the programs on farm economics, the study of agriculture as a branch of the economy of the USSR is put in the first place. Agriculture of course is one of the necessary branches of our economy. But the inadequacy of that definition is at once apparent from the fact that agriculture as such, as a branch of the economy, is made the subject of the science, rather than the study of the socialist system of agriculture, and its advantages. Agriculture in the USSR was a branch of the national economy also before complete collectivization, even when we had a multitude of individual peasants, some of which were kulaki. With the victory of the kolkhoz order, however, this branch of the national economy became a universal system of kolkhozy, MTS, and sovkhozy. It is evident, therefore, that agriculture simply as a branch of the national economy should not be regarded as the subject of farm

[5] "Agricultural Production," in *Five Technical Reports on Food and Agriculture . . .* (Washington, D.C., Aug. 20, 1945), p. 118. Two professors of the Moscow Agricultural Academy served on this Committee.

economics. The agriculture of the USSR has been transformed into the most advanced, the most progressive system of production. In accordance with this there is created a science of the socialist system of agriculture as the best and most progressive form of development and organization of agriculture.[6]

And further on:

The new program on "Economics of Socialist Agriculture," approved by the VKVSh [All-Union Committee for College Education] in 1945, puts an end to that harmful confusion.[7]

In most other countries numerous instances of careless or deliberate omissions, distortions, and misrepresentations can be found in documents of governments or governmental agencies. But these are open to criticism by government personnel, private scholars, and others, without jeopardizing the careers or safety of the critics. Not only is this freedom among those lacking in the USSR, but everyone is supposed to repeat the incorrect statements.[8]

CHARACTER OF THE RESULTS

While the study of current problems in contrast to historical research, normally involves thorough analysis of data that are relatively easily accessible, the quest for appropriate data dominates research on the USSR. One looks for data everywhere—in extremely technical publications, between lines, in what was not said but would have been said, and so on.

In spite of prolonged efforts, the iron curtain could not be lifted entirely. Many questions cannot be answered. Some of these are quite fundamental: Do the state farms, without having to pay rent for the land or interest on the investment, at least make both ends meet? How much, approximately, is the profit that the state-owned MTS (machine-tractor stations) make on their operations? The question of the share of the state in the income from agriculture can be answered only very roughly.

[6] *Socialist Agriculture*, September 1945, p. 8.

[7] *Ibid.*, p. 12.

[8] According to the order of the Presidium of the Supreme Soviet USSR of June 9, 1947, disclosure of any information of an economic nature which is declared secret by the Council of Ministers USSR is punishable by 8 to 12 years in concentration camp. Under Soviet conditions everything not permitted specifically for disclosure is certainly treated as "declared secret."

It is impossible to avoid some errors in estimates, statements, and conclusions. For reasons which need not be mentioned, the writer, when in doubt, has chosen to err on the conservative side and to select the interpretation more favorable to the Soviet Union. In the process of his work he has come to a strong and growing conviction that human consumption, feed use, and the grain crop were less in 1932 than they are estimated here, and to a lesser degree the same holds for the period from 1933–34 to 1936–37; but he could not bring himself to make further cuts in the official estimates. Livestock figures for the end of 1940 were not published until 1945. The writer's estimates preceding their publication turned out to be somewhat too high.

Although there are strong indications that the upward trend in agricultural production did not continue in 1939 and 1940, the writer has assumed a relatively large rise.[9] The intensified blackout during and after the war misled him into stating, early in 1946: "The guess should be chanced that the prewar level of production [in Soviet agriculture] may be reached in 1950."[10] This cautious prediction must have seemed heretical to the Soviet authorities, in view of statements such as those in the above-mentioned *Agricultural Production* and the optimistic goals of the 4th Plan. Yet it would not have been made had the writer then known the facts later disclosed in the Party decision and Andreev's report of February 1947.

THE USSR VS. THE UNITED STATES

An American observer visiting the USSR during the war complained, with poor taste, that the theatergoers were not dressed properly. Soviet officials themselves, however, tempt such comments. They boast a great deal about overtaking America, and point triumphantly to certain instances in which the Soviet Union already surpasses the United States, such as the yearly performance per tractor, truck, and combine in terms

[9] The preliminary findings were utilized in an article published in mid-1947 ("Intricacies of Russian National Income Indexes," *Journal of Political Economy*, August 1947, LV, 320). Additional information subsequently necessitated a downward revision of the estimates (for 1940) of gross production, volume available for sale and consumption in the farm home, and income from agriculture (Chart 3 and pages 673 ff.) just before going to press.

[10] Naum Jasny, "Decline and Recovery of European Agriculture: World War I and II," *Foreign Agriculture* (U.S. Dept. Agr., Off. For. Agr. Rel.) May 1946, X, 75.

of hours operated or acres covered. By thus placing the two countries on an equal basis they encourage other comparisons between them.

The United States is much better endowed with material resources than the USSR, especially when resources are related to population. It is also more advanced technologically. The fact that Soviet agriculture surpasses American agriculture in the number of hours that tractors, trucks, and combines are operated per year is evidence not of superiority but of poverty. The rich United States can afford to leave the machines idle in order to attain a high performance *per man* consistent with the comfort of the man. The poor USSR has to strive for maximum utilization of her machinery, even with great sacrifices of human labor and comfort.

A few comparisons between the USSR and the United States are made in this study. The first of these (in chapter vi) has the purpose of demonstrating the much smaller agricultural resources of the Soviet Union relative to its population. The only other important comparison between the two concerns the productivity per man in agriculture. This comparison is not made in order to show that productivity is greater in the United States—this needs no proof. The comparison is made for the purpose of ascertaining *to what extent* the productivity of labor in the Soviet agriculture is inferior to that of the United States. The finding is that in this country the productivity per man in agriculture is about four and one-half times as large as in the USSR. It puts in true perspective the official Soviet contention that "Soviet agriculture is the most mechanized agriculture in the world," and similar claims which many ill-informed persons take seriously.

PLAN OF THE BOOK

The inherent complexity of the subject made it impossible to cover adequately all pertinent problems. Of two approaches —discussing all of them more or less cursorily, or concentrating on a certain few and dismissing the rest with, at most, a mention—the latter was chosen. The study is primarily concerned with production and the factors directly connected with

it, such as land tenure, farm organization, mechanization, labor productivity, and so on. It contains no rounded-out discussions of prices (except in one of the two background periods—chapter x) or foreign trade. Part I, "A Summary View," includes brief discussions of some subjects, such as marketings and consumption, which are not comprehensively treated in the rest of the book.

The study deals primarily with the period 1928–40, which for simplicity is sometimes referred to as "the 'thirties." This was the hectic peacetime period of the first three Five-Year Plans. Only minor attention is given to the war and first two postwar years or to the 4th Plan for the period 1946–50, which in substance is limited to restoration of war losses. Less than a page is devoted—in the Summary View—to the outlook for the future, and little attention is given to the territories acquired by the Union since 1939.

While the Summary View contains a considerable amount of material not covered in the main body, by no means all material contained in the latter is recapitulated in the Summary View. Still, it is hoped that this part, in the form in which it is presented, provides what the title indicates—a summary view of the whole subject.

It is the writer's profound conviction that the socialization drive that characterized Soviet agriculture in the central period of this study was, politically and economically, an inevitable consequence of the triumph of the Bolshevik Party on November 7, 1917, rather than a *deus ex machina* that emerged in 1928 as a result of the victory of one wing of the Communists over another. While no extended consideration is here given to ideological developments and struggles, it seemed essential to tie in the collectivization era with its economic background by a rather detailed analysis of the preceding developments, starting with the beginning of the present century (Part II).

Part III treats of the various phases of socialized organization and control. The first chapter is devoted to the sovkhozy. Most of the others deal with the kolkhozy, which became the predominant form of socialized agriculture, and with the MTS which serve the kolkhozy. Particular attention is given to labor

productivity, the crucial problem of the reorganization of Soviet agriculture (chapter xviii).

Part IV is devoted to techniques (chapters xix and xx) and outputs (chapters xxi–xxvii). Mechanization (chapter xix) is dealt with at great length because it is officially given a very great, indeed exaggerated, importance in the reorganization of Soviet agriculture. So far as the present writer is aware, grain is the only farm product of Russia or the USSR that has been treated at length in English or any other non-Russian language.[11] A rather detailed product-by-product analysis seemed therefore indispensable.

The titles of Part V and chapter xxviii may easily mislead one to expect a full summary of output. Chapter xxviii is, however, concerned only with the values of the output, devoting considerable attention to the methods of estimating them. For an over-all picture of output in physical terms, the reader may turn to chapters xxi (Total Crop Production) and xxvii (Animal Products) in Part IV. Chapter xxix attacks the extremely difficult subject of the distribution of the income from agriculture among the various participants. In other countries this analysis is made by permanent staffs on government payroll.

The book is long and ponderous, contrary to the preference and earlier practice of the writer. It could not be otherwise in view of the size and complexity of the subject, the limitations of available information, and the intricacies of Soviet statistics. Moreover, in so far as the conclusions reached are out of harmony with impressions conveyed by Soviet writers and speakers and rather generally accepted, it seemed essential to set forth at length the procedure by which they were reached. On the other hand, many of the figures presented here and cited from Soviet sources were implied in those sources rather than frankly stated. They have been derived by comparison with other evidence in the same or other sources or by computation. Since the resulting figures are as reliable as if they had been printed they have not been qualified as "implied," for the term would have had to be repeated endlessly.

[11] V. P. Timoshenko, *Agricultural Russia and the Wheat Problem* (Stanford University, Calif., 1932).

To shorten the main body of the study much of the discussion, mostly of more or less technical matters, is given in a series of Appendix Notes. The data underlying the charts are presented with their footnotes in a separate Appendix. The footnote citations, other than individual articles in periodicals or collections, appear as a bibliography classified as to Soviet or non-Soviet origin.

PART I

A SUMMARY VIEW

CHAPTER II

THE SOCIALIZATION DRIVE AND THE PROCUREMENT SYSTEM

While the writer does not agree with much in the official history of the Communist Party, he subscribes fully to the characterization of the full collectivization of peasant farming, undertaken in the early 'thirties, as a "profound Revolution, a leap . . . . equivalent in its consequences to the revolution of October 1917."[1] Since the October Revolution was the second revolution, the collectivization was the third. In retrospect, the periods after the first two revolutions appear almost as previews of the real drama.

CONDITIONS LEADING TO COLLECTIVIZATION

In the USSR the period since the beginning of the collectivization drive is referred to as that of the Stalin Five-Year Plans. The peaceful period of the functioning of the prewar Plans (October 1928 to June 1941) was one of industrialization at a rate without precedent, of industrialization full blast. As shown for a few basic products in Chart 1, industrial production had increased very rapidly in the preceding six or seven years, but this represented chiefly recovery to the level of output reached before the Revolution. Many plants, shut down during World War I and the Civil War, could be brought back into operation at a relatively small outlay. During the recovery period it was therefore taken for granted that the rate of increase in production would slow down as the revival of existing plants gradually gave way to the expansion of these and the construction of new ones. The slowdown was expected to be very marked when additional production would have to come mainly from new plants. A special term was coined for it—"the extinguishing

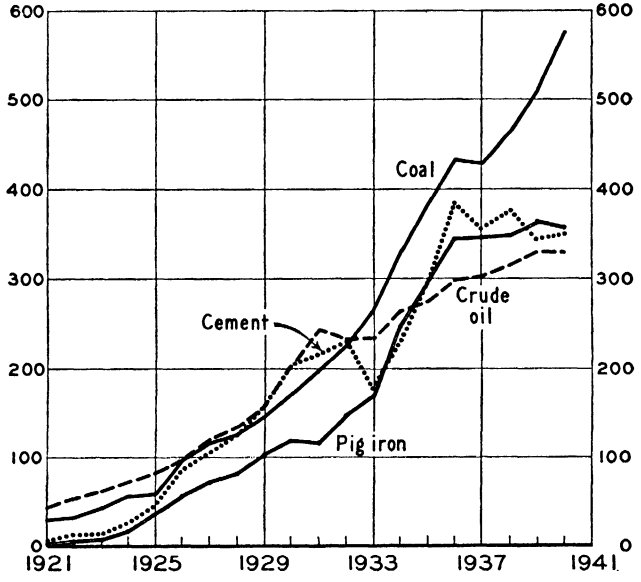
[1] *History of the Communist Party of the Soviet Union (Bolsheviks)*, ed. by a Commission of the Central Committee of the CPSU(B) (Moscow, 1946), p. 291.

curve." The Party decided, however, not to permit the extinguishing curve to become a reality.

When the Communist Party grasped political power in 1917, it found itself in an awkward position. The city proletariat, its ideological foundation, constituted only a small minority. It was confronted by an ocean of individual peasants, all of whom were small producers, largely of the self-sufficient type. This status had dominated Russian agriculture in Czarist times. The

CHART 1.—INDEXES OF OUTPUT OF BASIC INDUSTRIAL COMMODITIES 1921–40*

(*Base: 1913 = 100*)



* Data in Chart Appendix.

agrarian revolution of 1917 made it practically the exclusive form of farming.

The Bolsheviks gave their blessing to the agrarian revolution not as an act of good will but simply out of political considerations. Their distrust of the small peasant is indeed part of the official faith. The following quotations are standard in Soviet publications:

> The small enterprise creates capitalism and the bourgeoisie permanently, daily, hourly, inescapably, and on a mass scale (Lenin).[2]

[2] V. I. Lenin, *Works*, XXV, 173; quoted by Joseph Stalin, *Problems of Leninism* (9th ed., Moscow, 1934), p. 349.

The Soviet power cannot long be based on two contrasting foundations—on large-scale socialist industry which eliminates the capitalist elements, and on small-scale individual peasant economy which creates capitalistic elements (Stalin).[3]

A most rapid socialization of all economic enterprises appeared the only means of building a strong foundation for the Party. Practically all industry proper was socialized at once, but it was almost at a standstill (Chart 1). It seemed, therefore, advisable to concentrate on the rehabilitation of industry. For the time the peasant was left to his own devices, while his need to produce regardless of conditions was used as a foundation for industrial reconstruction. But the government's distrust of "capitalist elements" was not propitious for the emergence of a peasantry with adequate means of production and initiative—a slow process under any condition. The prohibition to buy and sell land was an effective barrier on the legal side, but the unfavorable price relationship between goods the farmers sold and bought constituted an even more serious handicap. This unfavorable price relation was the result of the fact, unforeseen by the Party, that socialized industry and socialized trade operated at high costs, while the type of private trade tolerated by the Soviets also had high costs and would not have existed without large profits (chapter x).

After an initial rapid recovery, effected mainly for purposes of self-supply, Soviet agriculture could not and did not show the rate of growth needed by the economy as a whole. Especially deficient were the marketings of farm products, yet their expansion was sorely needed for the rapidly growing city population and for industry. Inadequacy of voluntary marketings led to requisitions, referred to at that time as "extraordinary measures." These in turn brought the expansion of agricultural production almost to a dead stop. Industry rapidly expanding and agriculture moving at a snail's pace—this was the situation around 1927, when both industry and agriculture had regained the prewar level (chapter x).

The decision not to permit "the extinguishing curve" to become a reality after industry had reached the prewar level implied a much heavier investment in industry than during the

[3] Stalin, *op. cit.*, p. 362.

recovery period. Indeed, it called for enormous sacrifices on the part of all, and especially from that most passive component of the national economy and its producers—agriculture and the peasants. Under the conditions of a superrapid expansion of industry beyond the prewar level, the price relationship between the goods peasants sold and bought could not possibly be maintained at even the unsatisfactory level of the recovery period. Since this price relationship had to become even more unfavorable, the agricultural output of the sorely pressed peasants would inevitably have failed to expand in proportion to the rapidly growing requirements of the urban population and industry for food and raw materials. There was even good reason to fear that the output would decline. A drop in marketings would certainly have come. There was no point in retaining any longer an individual peasantry that was distrusted, and whose existence was only tolerated.

The solution was sought in socialized, large-scale, mechanized agriculture, tied in with a peculiar system of distribution of the produce. Soviet or state farms (sovkhozy) had to be enlarged in scope many times and collective farms (kolkhozy) made the only form of peasant farming. It was expected that the new agricultural system would produce greatly increased quantities at greatly reduced costs. The system of distribution, however, was to insure food for the urban population and raw materials for industry, at any production level and without regard to the consumption requirements of the producers themselves—at low prices and regardless of actual production costs. To make possible the planned "mad" tempo of industrial expansion, the reorganization of peasant farming into large-scale socialized enterprises had to be pushed with corresponding speed.

FAITH IN THE BIG ENTERPRISE

The distrust with which the Party regarded small peasant farming was closely connected with its faith in the great superiority of large-scale production, not only in industry but in agriculture as well. The Bolsheviks enthusiastically followed the rapid development of farm machinery abroad, especially

in the United States. They believed that this development added further to the superiority of large farms. Since the steam engine had brought about the Industrial Revolution, the Communists were especially interested in the mechanization of farm power. Because the tractor was relatively new in the first years of the Revolution, Lenin's enthusiasm was first directed toward rural electrification, but the progress of the tractor in the United States was eagerly watched. The less familiar the Soviet leaders were with its actual development, the greater was their admiration.[4] Lenin thought, or at least said, in 1919 that "if we could only provide agriculture with 100,000 tractors the peasants would turn Communists."[5]

Mechanical power based on the internal-combustion engine appeared to the Communists the panacea for all their agricultural troubles. Hubbard correctly stated: "The tractor is to the Russian Communist something more than a machine; in his heart of hearts he regards it as in some way a mystical symbol of the new faith."[6] Again, Chayanov wrote in 1929:

> This triad of American machine techniques—*the crawler, combine, and truck*—brings into the present techniques of agriculture, so far as we can judge from the available material, and in the organization of grain production, a technical revolution which in importance must be compared with the appearance of the steam engine in industry.[7]

The opinion was unanimously stressed that the tractor and truck virtually eliminated the factor of distance from farm center to field, which in the horse-and-ox era had greatly limited the profitable farm size.

Chayanov, who was well known abroad as the author of a standard work on farm sizes,[8] was chosen to expound the new ideas. In this early study, he masterfully elaborated the idea—accepted throughout the world—that agriculture differs greatly from industry in optimum size of enterprise because of the great

[4] On blunders in choosing types of tractors adapted to Russian conditions, see page 460.

[5] V. I. Lenin, Report to the VIIIth Party Congress, Mar. 23, 1919.

[6] L. E. Hubbard, *Economics of Soviet Agriculture* (London, 1939), p. 260.

[7] A. V. Chayanov, "Today and Tomorrow of Large-scale Farming," *Economic Review*, September 1929, p. 39.

[8] A. V. Chayanov, *The Optimum Size of Agricultural Enterprises* (Moscow, 1st ed., 1922; 2d ed., 1924; 3d ed., 1928).

role of transportation from field to farm center, and also because of the great variety of interconnected enterprises that a successful farm has to conduct simultaneously. These considerations had led Chayanov to accept the family farm as the most economic unit. He wrote: "As the ideal we think of the family peasant farm."[9] In 1929, however, one year after the publication of the third edition of his standard treatise, he stated:

> This triad of American machine techniques [crawler, combine, and truck] gives large-scale mechanical farming an overwhelming superiority over all other forms of organization of agriculture.[10]

In another 1929 article, Chayanov advocated for specialized wheat farms an optimum size of 100,000 hectares in crops, this being equivalent to a total crop area of about 400 square miles and a total farm area of 600 square miles or more.[11] Moreover, he expressed the opinion that the technical revolution in agriculture should not be confined to farms producing one crop only:

> This . . . . technical revolution is not limited to grain production but yields a strong position to large-scale farming also in those very intensive agricultural enterprises which were always believed the domain of the small family farm.[12]

Other writers put the same ideas in even stronger words. The following quotation from a leading article by Svetlov, the editor of the *Economic Review*, may be a revelation to Americans and West-Europeans:

> The experience of America [i.e., the United States] and western Europe shatters in a most unmistakable manner the archaic ideas of a certain "organic" nature of animal husbandry, allegedly requiring a kind of individual treatment. The experience also with reference to livestock proves the superiority in all respects of large-scale production over small-scale production, the large productivity of large farms . . . .[13]

[9] A. V. Chayanov, *The Optimum Size of Agricultural Enterprises* (2d ed., Moscow, 1924), p. 3.

[10] *Idem*, in *Economic Review*, September 1929, p. 39.

[11] *Idem*, "The Technical Organization of Grain Factories," *Economic Review*, December 1929, p. 101. It is noteworthy that in the foreword to the German edition of his standard study (*Die Optimale Betriebsgrössen in der Landwirtschaft*, Berlin, 1930, p. v) Chayanov suggested 40,000 to 80,000 hectares as the optimum size of such farms. A few months may have elapsed between the writing of the Russian article and the German introduction, but the time factor certainly was irrelevant. Nobody knows what Chayanov really believed. The present writer hopes that proof will appear that he was as sincere in these quoted opinions as the accused were in the "confessions" in the sabotage trials of the 'thirties.

[12] A. V. Chayanov, in *Economic Review*, September 1929, pp. 39–40.

[13] F. Svetlov, "A Bolshevist Sowing Campaign," *Economic Review*, January 1930, p. 10.

Referring to an experience which at that time was little more than one year old (see the description of the Shevchenko machine-tractor station on pp. 271–73), Stalin proclaimed:

> Broken down and disappeared in the blue air are the objections of "science" against the possibility and practicability of large grain factories of 50,000 to 100,000 hectares.[14]

Agriculture was furthermore considered to be as well adapted to specialized output as industry. Socialized state farms were established in physical environments similar to those in which specialized enterprises are found abroad, such as wheat farms in semiarid climates or sheep ranches in semideserts. But the list also included sugar-beet, flax, beef, pork, and many other specialized sovkhozy. The Party even ordered the organization of specialized kolkhozy along the same lines. The term "factory" began to be applied not only to single-crop farms but to any socialized farm of the present or the near future. Such serious scholars as Lyashchenko spoke of the kolkhoz as a "transition to a large collectivized agricultural factory."[15]

Hopes ran high; indeed, nothing seemed out of reach of large-scale socialized agriculture. A book by Nikulikhin, published in 1931, is symptomatic. After stating that per capita consumption of dairy products other than milk in the USSR was less than 20 percent of that in Denmark and Switzerland, he went on to say that he did not anticipate any difficulty in exceeding the level of these countries by the end of the general-plan period in the early 'forties. He stated his opinion as follows:

> The per capita rates of Denmark and Switzerland are not a limit for us (it is known that the workers and a large part of the peasants in Denmark reduce their butter consumption by using substitutes for it). A higher per capita rate of dairy products is possible in the USSR than there.[16]

Simultaneously butter exports would be increased several times, according to the author. All this would be feasible because in the short span of little more than ten years (from 1931, when

[14] Stalin, *op. cit.*, p. 438.

[15] P. Lyashchenko, "Certain Problems of Investigating the Organization of the Kolkhozy," *Economic Review*, January 1930, p. 75.

[16] Y. Nikulikhin, *Industrialization of Soviet Agriculture* (Moscow and Leningrad, 1931), p. 363.

he wrote, to the "early 'forties") the number of milk cows would be increased 2 to 2½ times, the milk yield per cow at least 3 to 4 times, and milk production 10 to 15 times. Similar prophecies for meat and all other farm products were advanced by the same author. Nikulikhin's predictions are worth citing because his book was published by the Scientific-Research Kolkhoz Institute of the Agrar Institute of the Communist Academy, and because lack of enthusiasm for such ideas was dangerous at that time.[17]

COMPULSION

A vast expansion of the state farms was mainly a problem of government action. The decidedly greater expansion of collective farming involved the attitude of more than 20 million independent producers who had clearly shown that they did not believe in the great advantages of large-scale farming.

Lenin correctly appraised the possible results of compulsory collectivization when, many years before the big drive, at the VIIIth Party Congress in 1919, he said: "There is nothing more stupid than the idea of compulsion with reference to economic relations with average peasants." Stalin's thoughts ran along the same lines for years. However, there was no choice for the Party; collectivization of the peasants was predetermined by its taking over the power in 1917 (chapter x). Compulsion, previously condemned, had to be resorted to. Collectivization was carried through in open fight against the most successful peasants (kulaki), who were correctly expected to be the most violent objectors. Large numbers of kulaki were exiled; many perished. Such action against the kulaki had the not unimportant additional advantage that their property, confiscated in favor of the kolkhozy, served as bait for the poorer peasants. The bulk of the latter were simply herded into the kolkhozy, although their final submission did not come before the man-made famine of 1932 swept away millions of lives.

[17] Curiously enough, the same Nikulikhin published an article in the leading Soviet agricultural journal (*Socialist Reconstruction of Agriculture*, July 1935, pp. 37–49) on the need for great improvements in the qualifications of agricultural experts—the old story of being unaware of the beam in one's own eye. With another dangerous and influential fanatic, D. Lurie, Nikulikhin published *The Party Policies in the Village* (Moscow and Leningrad, 1934), a textbook for Communist agricultural colleges.

Officially, however, the kolkhozy were brought into existence as voluntary organizations. The Resolution of the XVIth Party Congress (June–July 1930) declared emphatically:

> . . . . *in contrast to the sovkhoz*, which is a *state institution*, the kolkhoz is a voluntary social union of peasants, *organized with the capital of the peasants themselves*, with all consequences arising therefrom. [Italics of the source.]

The compulsory way in which the kolkhozy came into existence would have affected their functioning adversely for years, even if the idea itself were perfectly sound. As the kolkhozy actually developed, even the small minority who had favored them—aside from those who succeeded in climbing to privileged positions—became disillusioned.

There is little doubt that from the very start a certain degree of hypocrisy was involved in all the enthusiasm for large-scale farming. To be sure, the inability of such farms to hold their own against small farms in other countries the Communists could dismiss on the grounds that experience in capitalist countries has no validity for the Soviet socialized economy. But the fact could not have been entirely ignored that socialized industry and trade were operating at higher costs than the by-no-means-efficient pre-Revolution industry and trade. The functioning of the Soviet state farms likewise gave no grounds for enthusiasm (chapter xi), while the collective farms, highly subsidized and otherwise encouraged, did not show any substantial superiority over average individual peasant farms. After its inauguration in the early post-Revolution years, the kolkhoz movement fell into a state of stagnation (pp. 298–304). Furthermore, if faith in the immense advantages of large-scale farming had been entirely sincere, the tie-in with the elaborate system of procurements would not have been needed. But nobody knows how much of the enthusiasm was hypocrisy and how much genuine adherence of a sect to a theory having no support in fact.

The fact is that the procurement system was developed simultaneously with the big drive for collectivization of peasant farms. It was, indeed, an inseparable part of collectivization. Its main feature was that the producers had no say as to how much of their produce they could retain. Their "surpluses"

were fixed by the state and were determined without regard for the minimum requirements of the producers themselves.

The kolkhozy were obliged to deliver to the state their entire output of cotton, sugar beets, and some other technical crops; most of their wool, hides, and skins; and substantial portions of the other produce, especially grain. All deliveries had to be made from the first proceeds, i.e., directly from the combine, threshing floor, and so on. Strange as it may seem, the religious term, "First Commandment," was introduced by the unbelieving Communists, and is universally used in the Soviet Union, to apply to the obligation of the kolkhozy to deliver all the state's due out of the first returns.

The already low prices paid by the state for all deliveries were effectively cut further by the inflation. The prices of products only part of which went to the state, including the all-important grain, in time became almost nominal (p. 369).

To insure the smooth functioning of the kolkhozy, their requirements for seed, feed, and other purposes, such as reserve funds, were given second priority. The fulfillment of these requirements was indeed designated the "Second Commandment." Only the remainder went to the kolkhoz peasants (pp. 363–66).

It was proclaimed—perfectly in line with the delivery regulations—that only the small individual enterprises of the kolkhozniki serve their own needs first. (These enterprises are nevertheless subject to obligatory deliveries.) The kolkhozy in the first place serve the state. In a famous speech at the Second All-Union Congress of the shock-kolkhozniki in 1935, Stalin formulated this idea without the qualification "in the first place":

> It is better to proceed on the assumption that there is a kolkhoz economy, social, large, and decisive, needed for the satisfaction of social needs, and there exists along with this a small individual economy, needed for the satisfaction of the personal needs of the kolkhozniki.

Since the kolkhozy were established on land formerly held in free permanent tenure by the peasants and in large part owned by them even under the Czar; since, furthermore, they are operated with machinery and livestock of which a part was owned by peasants before the drive; and since all kolkhoz labor is that

of the kolkhozniki, collectivization meant not only compulsion in the matter of joining, but expropriation of the property of millions of small peasants, owners of one-horse and one-cow farms.

To insure fulfillment of their obligation to deliver the state's due out of the first proceeds, the kolkhozy have been subjected to the strictest regulation in every detail of their activities, even such as the choice of barley or oats to be sown in fulfillment of the spring-sowing plan. An elaborate Party and government apparatus with the center in Moscow was charged with seeing that all programs, and especially those pertaining to the First and Second Commandments, are fulfilled completely and on schedule. Chief among the measures taken were the transferring of tractors and most other machinery from the kolkhozy to the MTS (state-owned machine-tractor stations; see pp. 277–79), and the organization of sections of the political police in each MTS (p. 280). The self-governing rights of the kolkhozy are a fiction. The boards and the chairmen of the kolkhozy are merely cogs in the vast machine.

THE RESULTS

The socialization drive was proclaimed an amazing success, a brilliant victory. After a few years some 250,000 state and collective farms came to dominate the agricultural output, and a great deal of mechanization was introduced. Only about five percent of all peasants' holdings remained outside (pp. 304 ff.). Along with its political purpose of eliminating individual enterprises which, however small, were believed inimical to the Soviet system, the socialization drive in agriculture achieved to a large extent its major economic purpose of serving as a basis for the industrialization drive (Chart 1, p. 24). But this is about all it did achieve, and everything developed in a distorted way, under conditions incompatible with a permanent sound economy.

Socialized agriculture failed to produce either abundantly or cheaply (chapter iv and others). After an initial severe setback in the early 'thirties, which brought death to millions and extreme suffering throughout the country, agricultural production finally exceeded the pre-collectivization level in 1937.

But the increase was only a fraction of what was expected and needed; on a per capita basis, indeed, the pre-collectivization level was barely regained (chapter xxviii). Moreover, inedible goods comprised about 40 percent of the additional output. The level of per capita food production of pre-collectivization years was never again reached. Since the moderate increase in output was associated with a great increase in the utilization of non-agricultural materials and machines by agriculture, and also required the employment of an army of highly skilled technicians and highly paid administrative personnel, the cost of production actually increased.

The sovkhozy absorbed unexpectedly large investments and turned out such costly products that they soon had to be relegated to a minor role. The kolkhozy had to be made the permanent mainstay of socialized agriculture. They, however, were granted this role not because of their ability to produce abundantly and cheaply, but because through the procurement system the peasants were made to shoulder the consequences of the lack of abundance and cheapness.

The new procurement system, though shaky in the beginning, was rapidly expanded and consolidated. The concentration of millions of peasant households into a relatively few kolkhozy, which are directed and supervised at every step and are practically compelled to use state-owned machinery, made possible an all-penetrating control that has been used to extract from the farm population much heavier deliveries of agricultural products than could have been obtained *at the same level of production* from independent producers (chapters xvi, xxix, and others). This heavy flow of farm goods, which was expected to proceed from a greatly increased output, had to be extracted from total supplies that were only slightly increased, or even reduced. Large-scale farming, though it failed to enlarge the surpluses of farm products significantly, provided a successful means of extorting nonexisting surpluses.

There is no end to the boasting that in 1938 grain marketings were almost double those in 1913 and more than four times those in 1928. That collectivized peasant farms could have been made to deliver so heavily has even been proclaimed a

specific advantage of socialized agriculture. In his report to the XVIIIth Party Congress in 1939 Stalin said: "The large marketings of the sovkhozy and kolkhozy are their specific peculiarity."[18] N. Anisimov, the editor of the daily of the Commissariat of Agriculture, went so far as to claim as one of the results of "the victory of the kolkhoz system, the organizer of which was comrade Stalin," that "Soviet agriculture became the one with the highest proportion of marketings in the world."[19] The exultation over the success of the procurement system really implied an acknowledgment of the failure of the socialization drive to meet its production goals.

While the deliveries of farm products were large in relation to output, they were small compared with requirements. In spite of overwhelming pressure on the producers, marketings of farm products in 1932 were, at most, 20 percent above those of 1927–28, whereas the approved plan had called for an increase of 119 percent. The goal of the 2d Plan for marketings of farm products in 1937 was also missed by a wide margin.

One can hardly overestimate the shock that the whole economy suffered through these failures. In the USSR, as in every poor country, the urban population consumes much more food per capita in terms of value than the rural population. Since the urban population almost doubled in 1928–38, there actually was an immense decline in food available per capita of population reduced to a uniform basis.

Instead of improving as planned, the poor diet of the people deteriorated substantially (pp. 84 ff.); this resulted in lowered efficiency of labor and other adverse conditions. Furthermore, exports of farm products, which were supposed to expand so greatly as to pay for large imports of industrial equipment, declined from a level already low.

The cutback in prices for which provision was made in every Plan did not materialize. Instead, the persistent food shortage led to an inflation which, in size and duration combined, has few parallels in history. Even a socialized economy cannot fail to

[18] Joseph Stalin, *Problems of Leninism* (11th ed., Moscow 1947), p. 583.

[19] *Socialist Agriculture*, Jan. 20, 1946. See also Stalin, *op. cit.*, p. 63.

suffer greatly under a price system in which the currency varies widely, and in certain periods enormously, in value, depending on the commodity, place, seller, and buyer.

The necessity of permitting the kolkhoz peasants, workers, and employees to have their own enterprises was equivalent to renunciation of the original idea that all production would occur in socialized enterprises. It was a particularly great retreat that the peasants, workers, and employees had to be permitted to produce surpluses, and that special markets (the kolkhoz markets) had to be organized where those surpluses are sold at free prices by the producers direct to consumers. This arrangement involved extreme price differences from market to market, violent fluctuations from day to day, and inordinate waste of the time of both sellers and buyers. Such an ugly institution would not be tolerable in even the most primitive economy.

Last but not least comes the adverse effect of collectivization on the labor supply. The rural areas had a huge surplus of population before the collectivization drive. Reliable computations indicate that a little more than half of the farm population would have sufficed for the pre-drive output level if productivity in all agriculture had been as high as in the strata of the higher peasants, operating 35 to 40 acres of land with 2 to 4 small horses and a little hired labor. The All-Union Migration Committee estimated the surplus in the rural areas of European Russia in 1926–27 at 23,417,209 persons, almost one-third of the rural population of all areas with surplus population.[20] The lowest estimates run as high as 6 to 7 million workers immediately available in agriculture for outside employment (pp. 420–24). It was confidently expected that the merging of the small-scale peasant farms into large socialized units would not only vastly expand the farm output but also release an abundant flow of labor to industry. Actually, the large increase in farm output failed to materialize and yet a real shortage of labor ensued.

The delivery to the government of a large part of the kolkhoz output without adequate recompense, in the face of only a mod-

[20] M. I. Latsis, "The Basic Problems of Migration," *The Ways of Agriculture*, May 1927, p. 6.

erate increase in production and no improvement in the productivity of labor, necessarily led to a very low return to the kolkhoznik for his work in the kolkhoz. In the last prewar years his daily reward averaged roughly six pounds of grain, a few pounds of potatoes and vegetables, and a little forage (mostly straw), and the equivalent of about one kilogram of coarse bread or half a kilogram of white bread in money. By 1946 it had dropped to possibly one-half of this. Low remuneration is always associated with extensive waste. Whatever the reason, labor productivity in the kolkhozy on an hourly basis did not measurably exceed that of the pre-collectivization peasant, and may have been even less. The approximately 20 million individual enterprises of the kolkhozniki, workers, and employees are necessarily operated by the most primitive methods, typically with spade and watering can as the only implements of production, while the selling of their tiny surpluses in the kolkhoz markets requires a vastly disproportionate outlay of their time. State farms utilize their labor more effectively than the kolkhozy, but their share in total output is small and their saving in labor cannot sensibly affect the labor productivity in agriculture as a whole (pp. 436–38).

The release of labor from agriculture for industry could not but fall short of requirements, especially as the population growth also turned out much below expectations. Ultimately, labor had to be drafted from the kolkhozy for industry in the same way as for military service, while peasants had to be tied to the kolkhozy by such measures as obligatory minima of work for the kolkhoz and even limitation of free movement. But at best this insured *hours of work*, not quality. In no part of the world and at no time in history has compulsory labor proved efficient. Soviet socialized agriculture presents no exception. The economy based on such a foundation is neither efficient nor stable.

A GLANCE INTO THE FUTURE

The main body of this study does not discuss the future. A few words here may be in order.

The present economic structure of the Soviet Union is greatly

unbalanced. The agricultural potential is far too small to support the present industrial output and the large urban population associated with this. A semblance of balance is brought about by ever-increasing compulsion. It is difficult to conceive the present set-up as a permanent one. The collective-farm system, as it is organized and operated in the Union, is certainly incompatible with any other political system. No other regime would have the military-economic power to enforce it. Even a weakening of the political power would inevitably disturb the balance, if not lead to the collapse, of the collective-farm system.

The reduction in the number of work horses in the present territory to about one-quarter of those in agriculture before the pre-collectivization drive precludes a return to the pre-collectivization pattern in the foreseeable future. The pre-collectivization pattern of farming could, in any case, support only half as large an urban population as the present one, and a simple return to this pattern would be an enormous catastrophe. Some new organizational forms would have to be found for agriculture, with the collective use of machinery preserved in one form or another, and with the balance between agriculture and industry perhaps halfway between the pre- and post-collectivization patterns. The finding of that pattern and its practical realization will be an extremely painful and prolonged process.

FIVE-YEAR PLANS IN OPERATION

The aims pursued in the years between the end of the post-Revolution recovery period and the Soviet Union's involvement in World War II are laid down in the first three Five-Year Plans. A brief review of the plans gives a bird's-eye view of the developments in the dozen years that elapsed before the USSR was invaded.

The amount of detail given in the published Plans shrank greatly, from three volumes for the 1st Plan to a pamphlet for the 4th Plan. The 4th Plan does not even state the goals for acreages in all major crops, while information on progress expected during the 4th Plan Period, especially in individual areas, is even more scarce and vague, because it was desired not to reveal the situation in 1945, the base year of the plan.

The Five-Year Plans were preceded by yearly plans, published under the title *Control Figures of the National Economy USSR.* After the inauguration of the major plans which specified the goals year by year for at least the principal items, drafting of the yearly plans continued. They repeated or, when necessary, modified the corresponding goals of the Five-Year Plans. No attention can be given to the yearly plans in this study.

Some of the goals of the Soviet plans were merely promises given because they were believed necessary. Whatever the moral appraisal of such unfulfillable promises may be, an economist does not need to take them too seriously. Even the normal goals are largely established in the Soviet Union as something to drive at. They are not, or are not always, anticipations of what is most likely to happen. Moderate failures in reaching the goals are therefore not real failures of the plans and are not treated here as such.

Some specific information on each of the Five-Year Plans seems appropriate at this point.

1st Plan.—The 1st Plan was prepared by the Gosplan in 1928 and, after prolonged discussions, was approved by the Vth Congress of the Soviets in April 1929. The plan was scheduled to operate during the five years beginning with October 1928 and extending through September 1933. The original plan had two variants, a basic and a maximum. It was approved in the maximum variant, and the official English translation of the first volume of the plan contains only this variant.[21]

The expansion of industry proceeded with such rapidity that it became possible to fulfill the goals for the output of heavy industry and for the transportation of goods in less than five years. Although many items such as construction and light industry were far behind the goals, and some others, especially agriculture and consumption levels were complete failures, the 1st Five-Year Period was proclaimed successfully accomplished in four years, and the last three months of that year were made into a special period. The economic year was shifted forthwith from October–September to a calendar-year basis.

[21] *The Soviet Union Looks Ahead: The Five-Year Plan for Economic Construction,* Gosplan (New York, 1929).

The portion of the 1st Plan pertaining to agriculture was largely scrapped as soon as it was approved,[22] indeed in part before its approval. The rates of expansion of state farms were to be increased many times and a drive for the collectivization of all peasant farming had been decided upon. The goals for the output of crop products were boosted substantially above the levels provided by the 1st Plan. However, nobody knew how far they would or could go. For the state farms a sketchy plan for the remaining years of the 1st Plan Period was finally worked out in 1931. The collectivization drive proceeded without plan. As far as production goals are concerned, the kolkhozy operated on yearly plans which, however, hardly deserve this name.

Although even the maximum goals of the 1st Plan for agriculture were for the most part scrapped because they were too modest, both variants of the 1st Plan are presented in the present analysis. Millions of people were dying from hunger at the end of the 1st Period when, according to the Plan, the whole population should have enjoyed a substantially improved diet. The actual accomplishments in agriculture give even the basic goals an other-worldly aspect.

Perhaps an even more important reason for including the basic goals of the 1st Plan is that one may be reasonably certain that the Gosplan (the central planning agency) itself placed more reliance on the basic than the maximum variant. The Gosplan's appraisals are certainly a better guide to what would be attainable under proper conditions than the decisions of the Party, enacted by the Congress of Soviets.

2d Plan.—The 2d Plan, covering the five calendar years 1933–37, was approved by the XVIIth Party Congress in January 1934 and by the government on November 17, 1934. Thus the forecasts for 1937 were actually made not five but four years ahead, and the great discrepancies between plan and fulfillment weigh the more heavily. This was also true of the 1st and 3d Plans.

[22] See especially the resolution of the XVIth Party Congress, June 1930, in *Most Important Decisions on Agriculture*, State Publishing Office of Kolkhozy and Sovkhozy Literature (1st ed., Moscow, 1933), pp. 32–41.

While the 1st Plan had been approved in its maximum variant and many agricultural goals of this variant were later raised, the XVIIth Party Congress accepted the draft of the 2d Plan with reductions in the goals for the output of several important farm products.[23] The goal for grain, for example, was cut from 110.6 million tons to 104.8 million.

The reduction in certain goals decided by the Party Congress tended to make the 2d Plan less unrealistic, but there was no intention to follow these cuts through. Real magicians were busy patching up the draft to cut the ingredients and yet obtain the same amount of brew. While the output goals for several major products were curtailed, the goal for the national income from agriculture remained untouched at 17.6 billion 1926–27 rubles. Among the means by which this miracle was to be attained were the boosting of the value of unfinished production, a vague item, from 335.1 million to 529.3 million 1926–27 rubles, and the assuming of a fantastic increase in livestock herds by 924.4 million 1926–27 rubles in one year.[24]

There was no "mad" resistance of the kulaki nor upheaval of war, as in the 1st and 3d Plan Periods, to account for the non-fulfillment of almost all of the agricultural-production goals of the 2d Plan.

3d Plan.—The 3d Plan, for 1938–42, was approved in the spring of 1939. War broke out in Europe a few months later. Still, the first year and a half of the 3d Plan Period were fully normal. Moreover, in some reliable quarters it is doubted that the Soviet Union greatly speeded her own war preparations as soon as hostilities began abroad. But the Soviet economy was operating under such strain that relatively minor disturbances affected it considerably. The army was notably expanded. The draft of men from the farms would not have imposed a severe strain on agriculture if at least an appreciable part of the planned improvement in labor efficiency had materialized, but its effect was disruptive under the conditions that actually existed. That the production of tractors and other farm machinery

[23] See *2d Plan*, I, pp. vii and xiii, and *Draft of 2d Plan*, I, 460–61.

[24] *Draft of 2d Plan*, I, 460–61; *2d Plan*, I, 464–65. The expression "1926–27 rubles" is used as an abbreviation for "rubles at 1926–27 prices."

was considerably behind schedule in the immediate prewar years was due partly to increased production for war. Considerable numbers of farm horses were drafted. The accumulation of stocks of grain may have been accelerated with an eye on the war, and this may have had repercussions on livestock, mainly hogs. Still, for Soviet agriculture, the crop years 1939–40 and 1940–41 were years of peace rather than war. In the Soviet Union itself the time from January 1, 1938 to June 1941 is referred to as the three and one-half peaceful years of the 3d Plan Period.

4th Plan.—The war necessitated the scrapping of the unfinished portion of the 3d Plan. The 4th Plan, approved in March 1946 for the years 1946–50, is called the *Law for Restoration and Development of the National Economy*. But so far as agriculture at least is concerned, incomplete restoration is about all that can be expected.

CHAPTER III

THE SOCIALIZED FARMS

The big drives for the vast expansion of state and collective farms which started in the late 'twenties may properly be considered a unit and are so treated here. A slight lag, however, can be observed between the initiation of the big programs for state farms and the launching of the all-out drive for collectivization of peasant farming. This was not accidental. Only the state farm operated with hired labor was recognized as the true form of socialism. Even a large collective farm was accepted merely as a stepping stone toward the real thing. This attitude was strengthened by the fact that the commune, the form of kolkhoz most acceptable to the Party, was both unenforceable and ineffective, and acceptance of a kolkhoz farm containing bourgeois elements became inevitable in the big drive. Even when collectivization was proceeding at a furious pace, the sovkhozy continued to get the lion's share of the funds that the state was putting into agriculture.[1] Actual experience with state farms on a very large scale was required to show that they could not justify the high expectations of them. Only after that experience did the kolkhozy become the basic form of socialized agriculture; their conversion into state farms was postponed until the Union should surpass all other countries of the world in productivity—for all practical purposes forever.

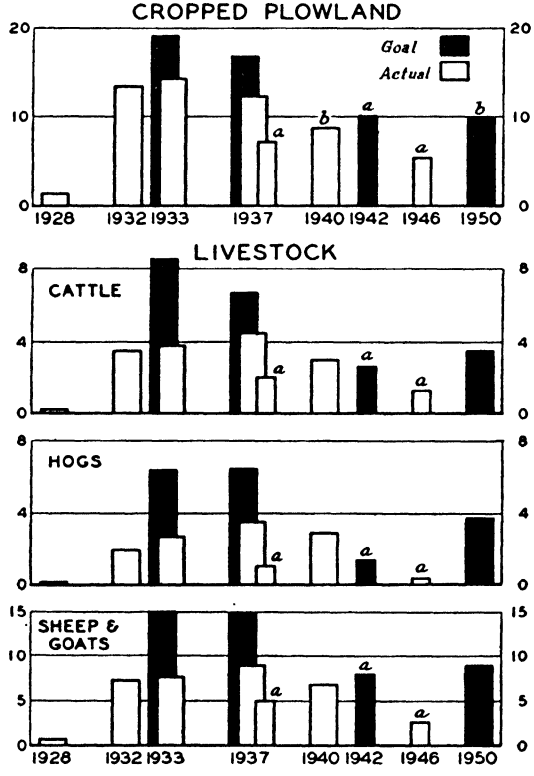
SOVKHOZY

1st Plan Period.—Since the activities of the small number of farms operated by the state before the big drive were nothing to boast about, the Gosplan displayed obvious and considerable misgivings in scheduling for the 1st Plan Period a nearly four-

[1] My friend V. P. Timoshenko thinks that the sovkhozy were established ahead of the kolkhozy primarily to provide a source of supplies that would free the state from dependence on kulak surpluses, and enable it to launch its decisive attack on the kulaki in order to foster collectivization.

fold expansion of sovkhoz cropped plowland and a somewhat greater expansion of their output. The goals that superseded these "very inadequate goals" specified a 16-fold increase in cropped plowland, a 22-fold increase in grain marketings, and so on (Chart 2 and pp. 237–39). In the huge burst of enthusiasm

CHART 2.—FIVE-YEAR PLANS: SOVKHOZY*
(*Million hectares; million head: note different scales*)



* Data in Chart Appendix. All sovkhozy except as noted.
[a] Sovkhozy of Commissariat of Sovkhozy only.
[b] Grain and livestock sovkhozy only.

and ignorance, all land reserves, including a great deal of submarginal land, were mobilized for the undertaking; even land held by peasants was invaded. The whole output was to be produced in huge, narrowly specialized establishments, all of which were to be highly mechanized or, in the case of grain sovkhozy, fully mechanized.

They learned in the Soviet Union that economic laws are

largely the same, whatever the political superstructure. The sovkhozy did not prove a success even in areas relatively well adapted to the production of one product (wheat) by fully mechanized methods. The grain sovkhozy were unsuccessful in combatting weeds. The residuals of grain production were wasted and the country could not afford the loss. Nor could it afford to leave unused the meadows and pastures interspersed among the arable lands of the sovkhozy. The cotton, sugar-beet, fiber-flax, hog, and other one-product sovkhozy failed partly for the simple reason that they were highly specialized: indispensable rotations were inadequate or completely lacking; the produce of the farm was not fully utilized; feed was not sufficiently varied. None of these enterprises was adaptable to full mechanization, and the sovkhozy were particularly weak in conducting those that required great labor inputs. This was especially true in such cases as livestock raising, where individual attention is crucial. The large overhead costs were the most important adverse factors of sovkhoz economy. All in all the sovkhozy proved expensive producers.

But this presentation partly anticipates the developments. During the 1st Plan Period sovkhoz activities reached 75 percent of the goals for cropped plowland and 40–50 percent of the goals for livestock numbers. The goals for marketings, however, were fulfilled only to the extent of one-third for grain and about one-fifth on the average for other products. The great disproportion between the degree of fulfillment of the goals for acreages and numbers, on the one hand, and that for marketings (i.e., output) on the other, implies an enormous amount of inefficiency and waste.

In 1932, 29.5 percent of the calves born on the dairy-beef sovkhozy of the Commissariat of Sovkhozy[2] died within the year. The cows of the same sovkhozy averaged only 505 liters of milk per year, or little more than half the pre-collectivization average of the cows of individual peasants. Unbelievable as it may seem, the hog sovkhozy of the Commissariat delivered only 108 kilograms of pork and fat per sow per year. No better proof of the waste and inefficiency is needed than the fact that the 2d Plan

[2] The Commissariat directed the most important group of sovkhozy.

called for a cut in production costs of the sovkhozy of the Commissariat of Sovkhozy by 63.3 percent.

2d Plan Period.—Even before the expiration of the 1st Plan Period a fundamental reorganization of the sovkhozy was decided upon. All things that had been particularly emphasized before, of which, indeed, they were especially proud, had to be abandoned. The sovkhozy had to be "de-enlarged" (see p. 254), despecialized and, to some extent, even demechanized.

The output goals of the 2d Plan were moderately below the revised goals of the 1st Plan, but nevertheless implied a trebling or near-trebling of the 1932 figure. Great boosts in yields per acre and per animal, decreased mortality of livestock, and speed-up in feeding were to be the major sources of that increase.

The sovkhozy were de-enlarged according to orders—with great losses in investment, of course. But they were not sufficiently elastic to make much headway with the introduction of side lines. Practically nothing came of the prescribed substitution of animal power for part of the tractor power, although under other conditions this certainly would have been profitable.

The policies toward state farms were changed during the 2d Plan Period. About 1935, the idea of making the sovkhozy a great factor in production and marketings was abandoned, and part of the land assigned to the sovkhozy was even turned over to the kolkhozy.

The gross value of the sovkhoz output rose from 1,390 million rubles in 1932 and 1,587 million in 1933 to only 1,865 and 1,631 million in 1937 and 1938 respectively. Although the most glaring inefficiencies were eliminated, production costs remained high. The large increase in milk yield per cow, the goal for which, as an exception, was almost reached, was attained by heavy feeding of purchased concentrates. The large administration was, however, the principal factor responsible for the high costs. Although the 1937 costs were kept down by excellent growing conditions in that year, the 3d Plan called for a 27 percent cut in the production costs of the Commissariat of Sovkhozy from 1937 to 1942.

The share of the sovkhozy in gross agricultural production amounted to 9.3 percent in 1937, according to official data, as

against 10.6 percent in 1932 (Table 1; see also Table 2 and Chart 3, p. 55, for the share of the sovkhozy in cropped plowland and livestock herds). But by 1937 they were more or less reconciled to having sovkhoz output at that moderate level.

TABLE 1.—GROSS AGRICULTURAL PRODUCTION, 1937, CLASSIFIED BY PRODUCER GROUP*

(Million rubles at 1926–27 prices)

Item	Total[a]	Sovkhozy and koopkhozy[b]	Kolkhozy[c]	Kolkhozniki[c]	Other individual producers[d]
Gross production	20,123	1,865	12,669	4,318	1,271
Vegetable products	15,069	1,342	11,445	2,035	247
Grain	6,352	588	5,653	63	48
Technical crops	1,746	87	1,622	25	12
Feed crops	1,782		1,319	168	
Potatoes and vegetables	2,949	667	2,851	1,780	186
Others[e]	2,240				
Animal husbandry	5,054	523	1,224	2,283	1,025
Output	...	...	913	1,931	...
Increase in herds	...	...	311	352	...

* For needed adjustments of official data used in this table see pp. 657–66 and 668–74.

[a] *3d Plan*, p. 68.

[b] *Socialist Agriculture USSR, 1938*, Gosplan (Moscow, 1939), p. 87.

[c] *Kolkhozy in the 2d Stalin Five-Year Period*, Gosplan (Moscow, 1939), pp. xi and 81. Data for kolkhozniki implied in the source.

[d] Determined as residuals. The gross production of this group amounted to 6.3 percent of the total; 4.8 percent was the share of workers and employees, and 1.5 percent that of the individual peasants.

[e] Includes fruits, improved-seed production, unfinished production, and other items. See pp. 656–57.

3d Plan Period.—Gross production of the sovkhozy was to be nearly doubled during the period of the 3d Plan, but most of this rise was to come from increased yields per acre and especially per animal. The 3d Plan (as indeed the 4th Plan and the extremely important Party decision of February 1947) continued to decry specialization as one of the major weaknesses of the sovkhozy. The shortcomings of specialization were stressed almost as vociferously as its advantages had been in the late 'twenties and early 'thirties.

More diversification than was available in 1937 or is available now would not bring about a fundamental change. Some

of the efficiency goals of the 3d Plan, such as an increase of milk yield per cow from 1,422 liters in the year 1937 to 2,500 liters in 1942, or a large output of pork per sow, could be attained only at unreasonably high cost. The fact would remain that the sovkhozy are high-cost producers, largely because of the expanded managerial superstructure.

Absence of reliable data for 1939 and 1940 precludes the possibility of close appraisal of the developments in the sov-

TABLE 2.—CROPPED PLOWLAND, 1938, CLASSIFIED BY PRODUCER GROUP*
(*Thousand hectares*)

Crop	Total	Sovkhozy and koop-khozy	Kol-khozy	Kol-khozniki	Work-ers and em-ployees[a]	Indi-vidual peas-ants
Grand total	136,943	12,411	117,227	5,337	1,113	856
Grain, total	102,411	8,496	91,920	1,189	214	592
Wheat	41,512	3,688	37,557	133	18	116
Rye	21,451	777	20,200	245	31	98
Barley	9,213	1,404	7,534	196	14	65
Oats	17,882	2,140	15,638	26	6	73
Corn	2,609	110	1,920	391	117	61
Millet	3,924	109	3,689	88	13	25
Buckwheat	2,085	19	2,040	4	2	20
Rice	164	9	146	7	1	1
Dry legumes	2,519	98	2,337	56	13	15
Technical crops, total	10,960	338	10,362	201	23	36
Cotton	2,083	83	1,992	0	0	7
Fiber-flax	1,882	3	1,836	31	1	12
Oil-flax	352	8	333	9	0	2
Hemp	654	8	542	97	2	6
Sunflower	3,145	69	3,006	47	18	4
Minor oilseeds	937	31	894	5	0	1
Sugar beets	1,231	104	1,127	...	...	...
Tobacco and makhorka	200	8	182	5	0	5
Medicinal crops, etc.	171	6	165	...	...	...
Potatoes	7,365	263	3,314	2,942	660	186
Vegetables	2,020	176	963	670	181	30
Feed crops	14,102	3,137	10,586	335	34	10
Silage crops	643	208	425	9	1	...
Feed roots	774	111	452	185	22	4
Rotation grass	12,685	2,818	9,709	140	11	6

* From *Cropped Plowland USSR, 1938*, Gosplan (Moscow, 1939), pp. 21–22.

[a] Private enterprises of laborers and administrative employees of sovkhozy and MTS, and of urban workers.

khozy during the first three and one-half years of the 3d Plan Period, i.e., before the Union entered World War II. However, if there was an increase in their output, it was insignificant.

4th Plan.—Some of the goals of the 4th Plan for the sovkhozy are apparently below those of the 3d Plan but above the prewar level. The goals for livestock are utterly unrealistic, but those for acreages, which are relatively modest, may be reached if great efforts are made.

KOLKHOZY

1st Plan Period.—With possibly even greater reluctance than in the case of the sovkhozy, the Gosplan provided for a twelve-fold increase in the number of collectivized households during the 1st Plan Period. However, the fulfillment of the goal would have resulted in a total collectivization of little more than 10 percent of all households. But this scheduled rate of collectivization was soon scrapped. In the avalanche-like drive of a few weeks in the late fall and early winter of 1929–30 about half of the peasant households of the RSFSR were additionally herded into the corrals. By the end of the Plan Period almost two-thirds of the households and about four-fifths of the peasant acreage were collectivized (pp. 304–09). The collectivization of the peasant livestock, not indestructible like the land, proved far more difficult, as we shall see.

Three forms of kolkhozy were distinguished before the drive —communes, arteli, and co-operatives for common cultivation of the land (TOZ). In the communes the members had everything in common, for the most part even their meals. In the TOZ the livestock remained outside of the kolkhoz and not even all of the arable land, draft power, or machinery were collectivized. The members of the arteli were left small plots for their vegetable gardens and they also owned some livestock; but most of the enterprises were in the hands of the kolkhozy. While the Party preferred the commune and took the artel as the second choice, the peasants favored the TOZ as interfering least with their activities (pp. 320–22).

The communes—a heavy burden on the budget—were soon recognized as an unsuitable form of kolkhoz in the big sweep,

intended to get rather than to give. The TOZ, which collectivized only part of the output, could likewise not be used to extract large quantities of farm products. Besides, they were inacceptable politically. With minor exceptions in special areas, the old kolkhozy were therefore converted into arteli and the new kolkhozy organized in this form.

Although the artel form was forced upon the peasants, it was by no means settled throughout the 1st Plan Period that the kolkhozniki would be permitted to retain some livestock in individual possession. The uncertainty in this matter, together with the extreme disorganization which led to a critical feed shortage, brought about the loss of roughly half of the livestock. In some areas as much as 85 percent disappeared.

The pre-drive kolkhozy were tiny affairs, averaging 12.5 households and 41.7 hectares of cropped plowland in 1928. Unsuccessful attempts were made in the big drive to bring the kolkhozy to the size of the new sovkhozy. The Party had to be satisfied with a six-fold increase in the average number of households and more than an eleven-fold increase in average cropped plowland (pp. 315–19).

Most of the forcibly enlarged kolkhozy—in contrast to their pre-drive predecessors—were large enough to use modern machinery. In spite of this, not only were the new tractors and machinery used with them concentrated in special organizations —the machine-tractor stations or MTS—but the small numbers of such machines already owned by the kolkhozy were taken away from them. Although the unions of co-operatives owning the MTS were so heavily controlled by the state that they were practically state institutions, they were ultimately transferred entirely to state ownership. The MTS had to play an important role in physically assuring fulfillment of the "First Commandment." For them to perform this function successfully, every semblance of influence of the peasants on their management had to be removed.

In contrast to the pre-drive machine-lending points which loaned their machinery to peasants, the MTS had to *perform* the various operations for the kolkhozy. A passive operation was replaced by an active one. Among other means to induce

the kolkhozy to use the services of the MTS, the obligatory deliveries to the state were made higher for those kolkhozy that preferred doing all their own work. The payments for the services of the MTS, like the obligatory deliveries, had to be in kind and constituted part of the "First Commandment" (pp. 285–93).

Labor was made the only recognized basis for the distribution of the share of the kolkhozniki in the kolkhoz proceeds. Emphasis was laid on the fact that payment did not have to be related to need. Stalin declared: "Each works according to his ability and receives consumers' goods not according to his needs but according to work for Society."[3] The "trudoden" was established as a unit of payment for this labor. Literally, trudoden means workday, but a day's work at different tasks is rewarded differently in terms of the trudoden. All operations except tractor-driving were divided into 7 groups. A day's work in each was declared to be equivalent to from one-half to two trudodni. The payment of tractor drivers was subject to special regulations. So far as possible, the number of trudodni due to each kolkhoznik was to be established on the basis of piecework. The total share of all members in the proceeds of the kolkhoz was divided by the number of trudodni earned by all of them during the year, and the "value" of the trudoden was thus established (pp. 363–66 and 402–03). The trudoden was proclaimed the tie between the kolkhoz and its members.

When hundreds of peasants were herded into one kolkhoz, the resemblance to a herd lay not only in the circumstance that their joining was not voluntary, but also in the fact that nobody knew anything about how the kolkhoz should be organized and run. Even the payments in trudodni and on the basis of piecework did not assume reasonably definite forms before the end of the 1st Plan Period. By that time it was also decided that the field work of the kolkhoz was to be entrusted to one or more special brigades and that the livestock enterprises were also to be taken care of by segregated units (the livestock fermy; see p. 353). All the organizational efforts did little to alter the fact that, so far as peasant farming was concerned, the 1st Plan Period was one of vast destruction and disorganization.

[3] Joseph Stalin, *Problems of Leninism* (11th ed., Moscow, 1947), p. 495; see also pp. 515–16.

The goals of the 1st Plan for kolkhoz output were discarded along with the rate of collectivization provided by the Plan. Efforts to attain the revised production goals turned out on the whole a great failure, especially in the case of animal products. Even so far as certain goals were reached or exceeded, failure of a sort was generally implied. The expansion of cropped plowland occurred largely at the expense of an undesirable cut in meadows and pastures. The overfulfillment in acreages under certain crops was offset by an undesired curtailment in others. Yields per acre and per animal deteriorated throughout—to three-fifths of the former level in some crops. The culmination was the great famine in the winter of 1932–33 (pp. 551–55), when millions died of starvation. A considerable increase in the death rate and a substantial decline in the birth rate were also observed in the preceding years and were not overcome before 1937 or 1938.

2d Plan Period.—The goal of the 2d Plan Period was to reach 100 percent in collectivization of peasant farming. This was virtually fulfilled. Only 0.9 percent of the peasant cropped plowland remained outside of the kolkhozy at the end of 1937. This later collectivization was achieved, not by direct compulsion as before, but by discrimination against individual peasants in obligatory deliveries, taxes, premium rates for obligatory insurance, receipts from insurance—indeed in everything (pages 312–15). In spite of the further expansion of the degree of collectivization, the 2d Plan Period, so far as the kolkhozy were concerned, was primarily one of consolidation within the modest limits attainable under Soviet conditions.

The 2d Plan sought an increase of almost 150 percent in kolkhoz output.[4] However, when allowances are made for the effects of favorable weather in 1937 and statistical exaggerations, less than half the desired increase is shown to have been attained.[5] Except for cotton, a few percent over the pre-collec-

[4] This rate is implied in the figure for output of the kolkhozy of 6,676.7 million rubles in 1932 (*Socialist Agriculture USSR, 1938*, p. 88) and the goal for total agricultural output in 1937 (26.2 billion rubles), as well as in the statement of the Plan that three-quarters of the total output in 1937 should be produced by the sovkhozy and kolkhozy.

[5] The official computation, which makes no adjustment for favorable weather conditions in the last year of the period and is otherwise biased, claims an increase of not quite 90 percent.

tivization level of yields was the best that could be reached, and in certain crops even that level was not attained. While certain sources of inefficiency and waste of early collectivization years were eliminated, the increases in yields were to a large extent attained by disproportionately large labor inputs.

Since the above-stated increase in kolkhoz production between 1932 and 1937 was accompanied by an increase in the number of collectivized households by 24.2 percent, there was an increase in output per collectivized household and per able-bodied person by about 25 percent. It is, however, extremely significant that the number of trudodni earned per able-bodied person increased by much more—as much as 60 percent—in the same period (Table 28, p. 411). The productivity per workday declined by about 25 percent.

Improbable as it may seem in view of the backwardness and scale of pre-collectivization farming, the productivity per man-hour in the kolkhozy at the end of the 2d Five-Year Plan was no higher than that of the *average* pre-collectivization individual peasant household and consequently was considerably below that of the more productive individual peasants. Only in the output of small grains and similar crops did the kolkhozy show a substantial superiority over the pre-collectivization averages. The labor inputs in technical crops,[6] potatoes, vegetables, and especially livestock were no less than the respective pre-collectivization averages, and in some cases were even greater. A substantial use of labor for administration, guards, and other non-productive tasks in the kolkhozy offset whatever saving could have been made as compared with individual enterprises (pp. 423–33).

With the state taking away without adequate pay a considerable portion of the kolkhoz produce and with the productivity per hour no higher than in individual farming, the reward of labor for a day's work was necessarily far below the pre-collectivization level. An itemized computation for 1937 (an excellent crop year) and 1938 (a poor crop year) indicates an average

[6] "Technical crops" in Soviet statistics comprise sugar beets, oilseeds, fibers, tobacco, rubber-yielding plants, and some other crops. Since the group includes some food crops the term "technical," though a not entirely appropriate adjective, seems preferable to the more specific term "industrial," used by the International Institute of Agriculture.

per-day reward only some 40 percent of that attained by the population engaged in agriculture before collectivization (chapter xxix). The reward per trudoden, the declared tie between the kolkhozy and kolkhozniki, failed to function adequately.

The low wages paid by the kolkhozy for ordinary labor (apart from their tendency to weaken the kolkhozniki's will to work and thus to increase the labor-time needed for a given task) led to a more lavish use of manpower than would have been required under another system, simply because men were so cheap. The work of the peasants, paid for in trudodni, constituted relatively the lowest cost-of-production item in the kolkhoz economy. It was not the kolkhoz land that was squandered, as had been asserted by the famous order of May 27, 1939 and again by the order of September 19, 1946; it was the trudodni and the work of the kolkhoz peasants. These were and are still squandered in the most prodigal way. Gleaning the fields, for example, may yield about 5 kilograms of grain a day. Farmers of the poorest European countries find such labor input scarcely worth while. But the kolkhozy can afford to follow this practice, as they have long done and are still doing, because their gleaners receive little more than half the value of the grain they salvage. Their total daily reward has frequently been equivalent to only 2½ to 3 kilograms of grain, and at present is even lower than that.[7]

The distressingly low incomes of the kolkhozniki, attended indeed by frequent brushes with starvation, added to the fact that the peasants do not look upon the kolkhoz property as their own, leads to extensive stealing of that property. Theft from storehouses and especially from the field, including unauthorized harvesting of kolkhoz crops, and probably also theft of the seed by those entrusted with seeding operations, is an inherent part of the system. Because of this, the kolkhoz goods are weighed and reweighed repeatedly, and since everything is handled by hand the labor input in these operations is con-

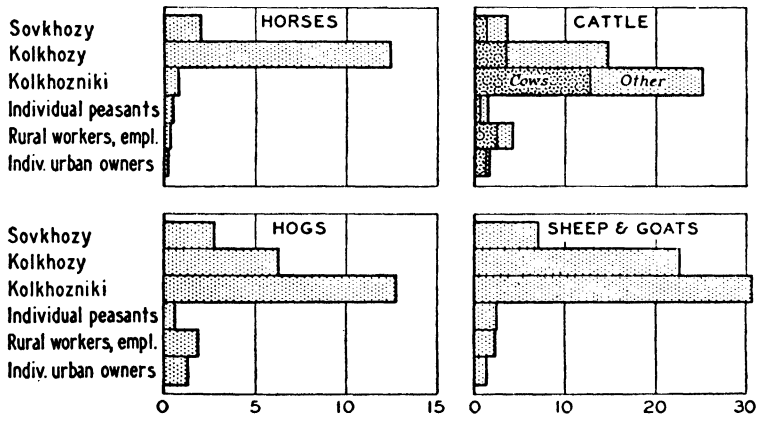
[7] A report from Stavropol in *Socialist Agriculture*, July 11, 1947, is devoted to achievements in gleaning grain by school children. The names of three children were given who picked 15 to 20 kilograms of heads per day. For another kolkhoz the highest average of three named children was 10 kilograms of heads per day. In a third kolkhoz three named children were paid 23, 17, and 15 kilograms of grain for five days of work "starting early in the morning." The report described the payment as good.

siderable. Even more labor is used for the providing of guards. Guards are in the fields, at storehouses, at almost every livestock ferma—hundreds of thousands, perhaps more than a million guards. The guards, of course, do not participate in the agricultural operations.

After the right of the kolkhoz peasants to own livestock was definitely recognized in 1935 (although limited in the principal agricultural areas to one cow and one sow, both with offspring, and a few sheep and goats), their almost negligible holdings of 1932 expanded rapidly. The kolkhozniki were also eager to utilize to the utmost their right to have individual gardens. Of the total production of kolkhozy and individual kolkhoznik enterprises in 1937, the latter accounted for 25.4 percent.

The combined output of the kolkhozniki, workers and employees,[8] and individual peasants amounted to 27.8 percent of the total USSR output in 1937 (Table 1, p. 47). This is slightly more than the 25 percent which the 2d Plan set for them. Since the total output goals of the 2d Plan were missed by a much greater margin than the difference between these percentages (Chart 3 and page 67), even this individual sector failed to fulfill the goal set for it. Its degree of failure, however, was

CHART 3.—LIVESTOCK NUMBERS BY OWNER GROUPS, JANUARY 1, 1938*
(*Million head: note different scales*)



* Data in Chart Appendix.

[8] The group, "workers and employees," includes laborers and administrative employees of sovkhozy and MTS, and urban workers who maintain gardens and keep livestock.

considerably less than that of the kolkhozy and especially of the sovkhozy.

3d Plan Period.—By 1938, the first year of the 3d Plan Period, the kolkhozy had about finished digesting what was digestible for them. They had reached yields which they were not likely to exceed substantially; they possessed about all the livestock they could maintain with the feed resources at their disposal; the labor of the kolkhoz peasants was utilized almost fully, indeed excessively in the case of women.

These circumstances were apparently more or less clearly realized by those in power. The goal of the 3d Plan for the increase in kolkhoz output was not as large as that of the 2d Plan. Much more important was the fact that part of the scheduled increase in kolkhoz output was to come from inroads upon the private economy of the kolkhoz peasants. This may not be clearly apparent from the rather indefinite statements of the 3d Plan. However, measures taken simultaneously with or shortly after the working out and approving of the 3d Plan, especially by the order of May 27, 1939, leave no doubt on this score. Thus the 3d Plan Period was characterized by a tightening up, a further attack on the peasants.

The legal limits on the kolkhoznik gardens, which averaged little more than one acre, were henceforth to be enforced strictly, thus releasing for kolkhoz work part of the time formerly used on private gardens. Even more important, the cut in their own enterprises could be expected to increase the kolkhozniki's need to work for the kolkhozy. The further planned increase in kolkhoz livestock was to have the same effect. To achieve this increase, part of the roughage formerly distributed to the kolkhozniki, and of the pastures they had used, were henceforth to be utilized for the kolkhoz herds. Thus their increase would be accompanied by a reduction in kolkhoznik livestock.

The problem of obtaining more work from the kolkhoz peasants was also attacked directly by the above-mentioned order of May 27, 1939, which established minima of work to be performed by each kolkhoz peasant. Since the time of the men was already about fully utilized, the measures aimed primarily at the women. The peasant woman, declared liberated from

family slavery by the kolkhozy, had to pay for her "freedom" by earning, in the principal farm areas, at least 80 trudodni per year in her kolkhoz. This was in addition to her heavy housework and practically the entire burden of maintaining the family's private garden and livestock. Eighty trudodni implied 60 to 65 workdays.

The punishment for non-fulfillment of the minima was to be expulsion from the kolkhoz and—the principal threat—loss of the gardenland. The analogy to serfdom had become increasingly justified. The serf owner did not pay for the labor of his serfs, but, on the other hand, he asked for much less labor than the kolkhoz was actually getting, allowed the serfs several times as much land, and placed no restrictions upon their livestock holdings.

As in the case of the sovkhozy, the increase in the kolkhoz output in the peacetime portion of the 3d Plan Period cannot be computed. But it certainly was only a fraction of the goal. In the case of cattle and hogs, increases in kolkhoz herds did not make up for the loss by the kolkhozniki. Generally, the gains of the kolkhozy may have been about limited to the loss in output of the kolkhoz peasants.

4th Plan Period.—In respect of the kolkhoz setup, the 4th Plan Period may turn out to be merely a continuation of the 3d Plan, namely, one of even greater restraints on the kolkhoz peasants.

Procurements had become much heavier, relatively, during the war and remained heavier with the return of peace. Since the total number of trudodni earned during the year did not decline, and possibly even increased, the value of the trudoden, very low before, dropped still further. To offset the inevitable decline in the kolkhozniki's will to work, premiums in kind are being greatly stressed. They were introduced shortly before the war but were not widely applied. Everyone, including the personnel of the MTS, who is connected with the production of certain products in one way or another, is now given the right to a premium in case the goal is exceeded.

Ostensibly, the premiums come only from additional output; actually they imply a further decline in the value of the tru-

doden or, at least, hinder its increase. Whatever advantages the premium system offers may be offset by its negative effect on the value of the trudoden. Rearrangements in the manner of rewarding the kolkhoz peasants may be empty gestures so long as the amount available for the total reward remains inadequate. This leads one back to the heavy government procurements.

While premiums are greatly stressed, the other measures taken during the 3d Plan Period for insuring adequate work of the kolkhoz peasants for the kolkhozy are strengthened. Raising the obligatory minimum for work of the kolkhoz peasants to 100 trudodni in the principal agricultural regions in 1942 was explained by war conditions. But no explanation was offered for the fact that those very war conditions were taken advantage of to force drastic cuts in the kolkhoznik livestock, while those of the kolkhozy were largely or fully maintained. By mid-1947 none of the wartime regulations pertaining to kolkhoz labor had been revoked, and no promises in this direction seem to have been made. While the 4th Plan foresees a recovery in kolkhoznik livestock, all individual owners (kolkhozniki, individual peasants, and workers and employees) are expected to possess a considerably smaller proportion of the total livestock at the end of the period than on January 1, 1941. Moreover, there is little doubt that the kolkhoz herds will be relatively closer to their goals by January 1, 1951 than the holdings of individual owners.

By the order of September 19, 1946, the drought year with very poor crops and much starvation, a renewed check-up of the gardens of the kolkhozniki was ordered. The violations of the corresponding regulations of the 1935 Artel Charter proved on a very tiny scale; most excess holdings were probably below one-quarter of an acre, for the total land excessively held averaged less than one-tenth of an acre per kolkhoz household. In any other country such victory or post-victory gardens would be encouraged by all means. Yet the orders have been vigorously enforced. Contrary to the situation in 1939, a special permanent committee was organized by the government of the USSR, with special agencies throughout the country, to see that violations of the Artel Charter of 1935 were eliminated.

THE NEW TERRITORIES

The analysis of the kolkhoz organization in this chapter, as indeed throughout the whole study, pertains only to the pre-1939 territory.

The adding of new territories in the west, which started in 1939, was in the first place accompanied by measures resembling the agrarian revolution of 1917 in the old territory. All land was declared state property. A large part of the former big estates was divided among landless and smallest peasants; the balance was retained as state farms.

The organization of kolkhozy was favored, but no drive has been made like that in the old territory in the winter of 1929–30. It is even probable that the discrimination against individual peasants in obligatory deliveries and other things has not been so pronounced as it was in the old territory. In contrast to the situation in the USSR in early years, when the commune was the most privileged form of collective, the kolkhozy in part of the new territories, at least, were permitted to limit their activities to the cultivation of land, while all livestock remained in individual ownership. Along with a limited number of MTS of the usual type,[9] machine-horse lending points were organized on the pre-drive Soviet pattern; they lend their machinery and workstock to the producers rather than perform operations for them. Moreover, individual peasants are to a large extent the exclusive customers of the MTS and especially of the machine-horse lending points. The usual "capitalist" forms of farmers' co-operatives (credit, sales, purchases) have been preserved and their spread encouraged. In mid-1947 an individual farmer in the new territories was still treated as a lawful link of the economic machine rather than as a pariah.

The new territories are all areas in which the individualistic principle was fully established among the peasantry. Whatever importance can be attached to the effect of the land commune on the mentality of the Russian peasant, communal ownership of land was a matter of the remote past west of the pre-1939

[9] There were apparently little more than 300 MTS in those territories on Jan. 1, 1941 (see note *c* to Table 22, p. 274) and not many more in mid-1947. Many if not all of these MTS were small.

boundaries. No evidence can be found in Soviet literature, however, that this different situation influenced the Communist regime in its present policy. Moreover, it would be too optimistic to believe that the deplorable results with collectivization in the old territories taught a thorough lesson. The wish to acquire the good will of at least a certain proportion of the population in the new areas may have been a big factor in the postponement of full collectivization. The unstable political situation in the period between the acquisition of the new territories and the entrance of the USSR into World War II may also have played a role. The critical shortage of machinery after the war would in itself be a sufficient reason for delay.

It is hardly likely that the contrast in the position of individual peasants—i.e., the peasants remaining outside of collective farms—in the old and new territories will be maintained long after the present acute shortage of machinery is eliminated. The idea that "the small enterprise creates capitalism and the *bourgeoisie* permanently, hourly, daily, inescapably, and on a mass scale," seems as vigorous as ever. There is no reason to expect a drive like that of the winter of 1929–30. The discrimination against individual peasants which brought millions of them into the kolkhozy during the 2d Plan Period is a sufficiently strong weapon. It will probably soon be applied with increased vigor in the new territories.[10]

[10] As of October 1948, the drive was in full swing.

CHAPTER IV

PRODUCTION AND INCOME: GOALS AND RESULTS

The failure of the ambitious plans to boost farm output is implied in the disappointing results of the activities of the two forms of socialized agriculture, discussed in the preceding chapter. Here the same will be shown with respect to the output itself, as well as the incomes.

INVESTMENT

Instead of increasing by one-third, as planned, the investment in means of production in agriculture declined by considerably more, perhaps by as much as one-half, during the 1st Plan Period, chiefly by livestock destruction in the collectivization drive. This decline was not fully made up until 1938. No data are available to show more recent developments. Livestock herds declined in 1938–41. This decline may have been overcompensated by increase in the investment in machinery and buildings; but the net increase, if any, was small during the peacetime portion of the 3d Plan Period (Appendix Note B).

Through destruction and surrender to the kolkhozy, the peasants lost more than one-half of their means of production during the 1st Plan Period, when the goals of the all-out collectivization drive—ordered in disregard of the corresponding but less ambitious goals of the 1st Plan—were greatly exceeded. The group of individual peasants continued to lose their property through joining the kolkhozy during the 2d Plan Period, but there occurred a large increase in livestock holdings of the kolkhozniki, workers, and employees. In 1938 the investment of the whole private sector (kolkhozniki, individual peasants, workers and employees) in means of production amounted to little more than one-quarter of the total investment in agriculture.

Correspondingly, the means of production owned by the so-

cialized sector increased from an insignificant fraction of the country's total in 1928 to nearly three-quarters in 1938. In that year, more than half of the socialized means of production belonged to the kolkhozy, their share being formed of contributions of members, confiscations from the better-off peasants, and new acquisitions. Thus, if the kolkhozy could be regarded as a special kind of peasant institution, considerably more than half of all means of production remained the property of peasants. Most of the strictly state-owned socialized means of production was invested in sovkhozy. While the goals for sovkhoz production were missed by wide margins, the needed investment proved considerably larger than expected. Provided the means of production are correctly appraised, the state-owned MTS rank far below the sovkhozy in size of investment. The great power over the peasants that the possession of the machinery gives to the state is attained with but a small investment (pp. 716–17).

The composition of the means of production naturally changed greatly during the prewar plan periods. Increased investment in tractors eventually compensated for the great decline in draft animals. Large-scale machinery and large buildings replaced small-scale machinery and small buildings.

Perhaps half of the prewar investment in agriculture was lost during the war. Restoration to the prewar level will extend beyond the 4th Plan Period. When it has been accomplished, the share of the individual sector in the pre-1939 territory will be even less than before the war. In the socialized sector, a further relative strengthening of the investment in the MTS at the expense of the kolkhozy will have taken place.

MECHANIZATION

When the avalanche-like drive started, the plan to base socialized agriculture exclusively or mainly on mechanical power could not be fulfilled. Although a real effort was made to speed up domestic production of tractors and to provide the greatest possible means for importing them, the supply of mechanical power fell far behind the needs. The enormous losses of horses long remained unreplaced by other sources of power, and short-

age of draft power was a major factor in the decline of production in the early 'thirties.

The efforts to speed up the output of tractors and other agricultural machinery gained momentum in the 2d Plan Period. In this respect the imposing goal of the 2d Plan was by and large fulfilled. By the end of the 2d Plan Period a considerable degree of mechanization had been achieved. The USSR could truthfully boast that she exceeded the United States in the proportions of land plowed by tractors and of grain harvested by combines. In all other operations the degree of mechanization attained in the USSR is generally much less than in the United States, and many important tasks are still performed without any machinery in the old-fashioned way. Although the change in Soviet agriculture was very great, such boasts as the following cannot, of course, be taken seriously:

> Our agriculture is, consequently, not only the largest-scale and most mechanized, and therefore most commercialized agriculture, but also is equipped with more modern techniques than the agriculture of any other country.[1]

For several reasons, mechanization in the USSR lacks many of the advantages that it has in other countries. The number of machines is very inadequate for the operations that have to be performed with them. Even in the best years, various operations could not be performed at the most appropriate times, and night work had to be resorted to, with adverse effects on the quantity and quality of the output and with considerable inconvenience to the workers (such a trifle as the latter, however, is never mentioned in the Soviet Union). Since the selection of operations to be mechanized is determined partly by political considerations, some are mechanized that are not profitable for such a poor country as the USSR, and some that should be mechanized are not. The yield-raising power of machinery—belief in which was a major factor in the planned great increase in output—turned out to be largely a myth. Only a fraction of the manpower that was expected to be released by mechanization was actually set free (p. 389 and chapter xviii).

The lack of reserve capacity in machinery proved particu-

[1] Joseph Stalin, Report to the XVIIIth Party Congress in 1939.

larly injurious during the war. In spite of great drafts of manpower and horses for military purposes, there was a considerable decrease in the rate of mechanization. By the end of the war virtually all machinery had become obsolete. There had been no replacement with new machinery. Existing equipment was used very intensively by operators who, for the most part, were inexperienced, and repairs were made by inexpert mechanics using defective spare parts.

Owing to continued armament production after the end of the war, reconversion of factories to the output of agricultural machinery proceeded slowly until the end of 1947. The 4th Five-Year Plan foresees no very large output of farm machinery until the latter part of the Plan Period. The prewar level of mechanization, however, will be restored before that of the output of farm products.

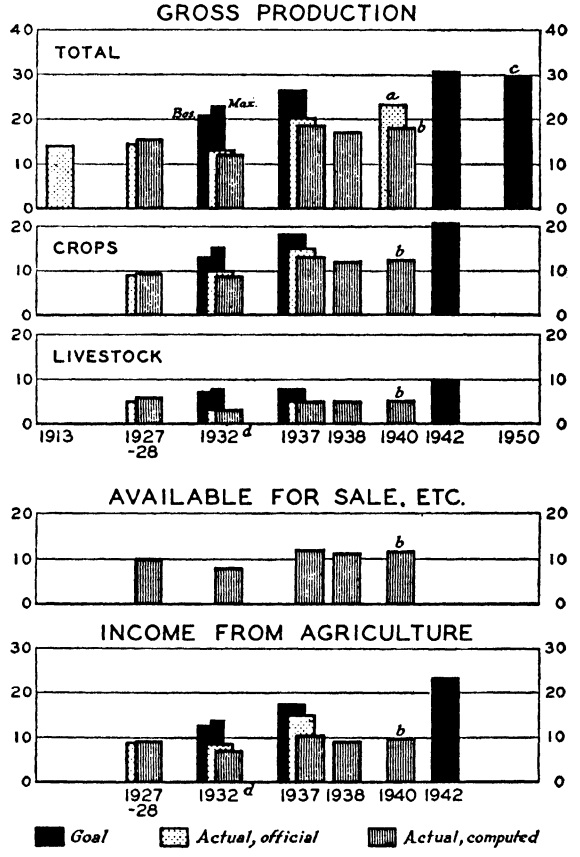
OUTPUT

Soviet statistics include two measures, indexes, or indicators of agricultural output: *gross agricultural production* and *income from agriculture*. Both are commonly expressed in terms of values in 1926–27 rubles, i.e., rubles at 1926–27 prices. The first represents the sum of gross production of crops or "vegetable products" (excluding pasture) and of gross production of animal products (excluding farm-produced draft power), and thus includes a considerable amount of duplication. The second, sometimes referred to as *net agricultural production*, is roughly equivalent to "value added in agriculture" as computed in other countries. Three series of indexes, however, are discussed in detail on pages 657 ff. Two of these are the Soviet series adjusted by the writer for duplications and omissions and bear the same titles. The third, *production for sale and household consumption*, here presented for the first time, is an intermediate step in the calculation of income from gross production. In the following discussion the writer's figures are used to show actual developments.

1st Plan Period.—All indicators show substantial declines from the pre-collectivization level to 1932 (Chart 4). Although the basic and maximum variants of the 1st Plan ordered re-

spective increases of 44 and 55 percent in gross agricultural production, it actually declined 23 percent during the period. Production for sale and household consumption declined slightly less (20 percent), but income from agriculture dropped even

CHART 4.—FIVE-YEAR PLANS: AGRICULTURAL PRODUCTION AND INCOME*
(Billion rubles at 1926–27 prices)



* Data in Chart Appendix.
[a] Undefined territory. [b] Pre-1939 territory. [c] Enlarged territory.
[d] Actual for 1932; goals for 1932-33.

more (24 percent), because mechanization raised the outlay for non-agricultural materials and for the allowance for depreciation in the face of declines in investment and output. The enormous losses resulting from destruction and obsolescence of buildings and machinery of the private sector, and from the vast

decline in livestock, were ignored in the official computations of depreciation (see p. 665) and are not considered here.

Even before collectivization, the Soviet Union had little more than the bare minimum of food. The 1932 agricultural production was about 20 percent below the pre-collectivization level, had been preceded by a small output in 1931, and was unevenly distributed among an increased population. This spelled disaster. Rationing had been restored as early as 1929, but the rations were very inadequate and the prices of unrationed food soared. In 1928 a kilogram of rye bread had cost 9 kopeks in co-operative stores throughout the USSR,[2] and 8 kopeks in those of Moscow. In 1932 rye flour was sold at 320 to 390 kopeks per kilogram in the kolkhoz markets of Moscow, and even the government charged 280 kopeks for it in its "commercial stores."[3] Other foodstuffs commanded similarly exorbitant prices. Meat, for example, sold in the kolkhoz markets of Moscow in November 1932 at 1,217 kopeks per kilogram as against 66 kopeks in co-operative stores of the Union in 1928; and potatoes fetched 147 kopeks as against 6.9 kopeks.[4] Yet the average monthly wage in industry increased by only 64.3 percent from 1928 to 1932.[5]

The situation of the hungry urban dwellers was, however, enviable compared with that of the rural population. At the end of the 1st Plan Period millions in the rural areas were dying from starvation (see pp. 551–56). It is scarcely conceivable that exultation could have been voiced under these circumstances. Yet the fully reorganized Gosplan concluded its appraisal of the results in agriculture in these words: "Such are the brilliant victories of socialism achieved in the sphere of agriculture as the result of the fulfillment of the 1st Five-Year Plan."[6]

The following reprimand helps one to understand the nature

[2] *National Economy USSR: Statistical Handbook 1932*, Central Office of National-Economic Accounting (Moscow, 1932), pp. 348–49.

[3] G. M. Gorelik and A. I. Malkis in *Soviet Trade*, here quoted from Alexander Baykov, *The Development of the Soviet Economic System* (Cambridge, England, 1946), p. 244.

[4] *National-Economic Plan for 1936*, Gosplan (2d. ed., Moscow, 1936), p. 334; *National Economy USSR . . . . 1932*, pp. 348–49.

[5] *Socialist Construction USSR, 1936*, Gosplan (Moscow, 1936), p. 524.

[6] *Summary of the Fulfillment of the 1st Five-Year Plan for the Development of the National Economy of the USSR*, Gosplan (English ed., Moscow, 1933), p. 22.

of the victories referred to by the Gosplan. Victor Kravchenko, having been sent to the starvation area on an official mission, tried to help as much as he could. When he had returned, his superior told him:

"You're a future engineer, I'm told, and a good Party man. But I'm not sure that you understand what has been happening. A ruthless struggle is going on between the peasantry and our regime. It's a struggle to the death. This year was a test of our strength and their endurance. It took a famine to show them who is master here. It has cost millions of lives, but the collective farm system is here to stay. We've won the war. . . . ."[7]

The large increase in grain exports in 1932 as compared with 1927–28, from 320,000 tons to 1,750,000,[8] fits well with this attitude.

2d Plan Period.—In spite of the marked decline in production during the 1st Plan Period, the 2d Plan (for 1933–37) was not satisfied with the goals of its predecessor. It scheduled for 1937 a level of gross agricultural production 18 percent above the maximum goal of the 1st Plan and double the production level of 1932.

About half of the increase in gross production planned for 1937 was achieved, the total being 53.4 percent above 1932 and 38.6 percent above the original estimate for 1927–28 according to official computations. Even this not very favorable showing was due in part to exceptionally favorable weather in 1937. The writer's computation for 1938, made comparable with that for 1928,[9] indicates an increase in gross agricultural production of 12 percent over the decade 1928–38. The corresponding figure for the volume available for sale and for consumption in the farm home in 1938 was 15 percent above that of 1928 (Chart 4, p. 65).

While gross agricultural production, according to official data, increased 53.4 percent from 1932 to 1937, the income from agriculture was boosted by 77.4 percent according to the same source. The phenomenon is even stranger if it is stated in absolute figures. The additional gross output of 7 billion rubles

[7] Victor Kravchenko, *I Chose Freedom* (New York, 1946), p. 130. Chapters viii and ix give a vivid picture by a participant.

[8] See note 6, p. 86.

[9] Normal weather assumed, data adjusted for change in method of estimating grain crops, and other revisions in both years. See chapter xxviii, especially pp. 673–74.

is supposed to have been obtained with an increase in outlay of only 0.5 billion rubles. The total outlay is assumed to have declined from 36 percent of the value of the gross output in 1932 to 26 percent in 1937. According to the 2d Plan the percentage was to be 33. All these computations were never supported by any details and cannot be. The writer had to go independently into the whole matter (see pp. 676–79).

Expenditures for goods of non-agricultural origin used in agricultural production (motor fuel, lubricants, and fertilizers), as well as depreciation of machinery, rose greatly during the 2d Plan Period; indeed, the total of these cost factors more than doubled. According to the writer's computations, income from agriculture increased only 49 percent from 1932 to 1937 as against an increase in gross production of 55 percent. From 1928 to 1938, income from agriculture increased but slightly if at all, the computed increase of around 2 percent being within the limits of probable error.

3d Plan Period.—The 3d Plan called for an increase in gross agricultural production in 1942 of 52 percent over the official figure for the crop year 1937.[10] Since the weather was very favorable in 1937, the expected increase was actually larger than this. The goal implied an increase of 16.4 percent over the 1937 goal of the 2d Plan, to more than double the 1928 production level.

N. A. Voznesenskii, president of the Gosplan, in his speech at the first session of the Supreme Council of the USSR, introducing the 4th Plan to the Congress of Soviets in March 1946, gave as the official estimate for 1940 (in a single figure without details or explanation) a gross agricultural production index of 15.7 percent above 1937, as usual without stating the territory to which the 1940 estimate pertained. The writer's computations are less favorable.

The rising trend of gross agricultural production came almost to a standstill by 1937 or 1938. If weather conditions had been average in both 1937 and 1940, gross agricultural production would have been somewhat higher in 1940. The detailed analysis summarized in chapter xxviii indicates for 1940

[10] *3d Plan*, p. 68.

a decline in gross agricultural production by about 3 percent from the actual figure for 1937 (an excellent crop year). The computation for 1940 is made on the assumption of average weather conditions and unchanged territory. Voznesenskii's 1940 figure was not comparable with the latter since it pertained to a larger territory than the 1937 figure.[11] However, the extension of the method of estimating output in on-the-root terms to practically all crops in 1939 or 1940 must also have been a factor in the overestimate.

While the aim of the 3d Plan to raise gross agricultural production to 30.5 billion rubles[12] was extremely optimistic, indeed fantastic, the goal for income from agriculture of 23.4 billion rubles in 1942 may just as well be ignored. A gross agricultural production of 30.5 billion rubles, if reached, would have yielded a net income almost 10 billion less than that stated in the Plan.

World War II.—Agriculture suffered greatly in the war. In 1945 its output (postwar territory) was possibly 40 percent or more below prewar. An area with more than a third of the nation's agricultural potential was invaded by the Germans. Socialized agriculture, disliked by the farm population, was an easy prey to the enemy. Planned destruction and evacuation by the Russians was apparently a minor factor in the losses of the occupied territory. But agricultural output of the uninvaded territory also declined greatly. Even before the war Soviet agriculture was operated on the principle of day-and-night work of machinery and full utilization of the available labor force, including all women and to some extent even children 12 to 15 years old. The sudden removal of great numbers of men and of part of the tractors and horses at the start of hostilities inevitably hurt it badly. Moreover, a blunder later recognized and to some extent remedied was committed in stopping the output of spare parts for the remaining tractors and machinery by large factories. A marked decline in farm output followed directly upon the first shot; one can even rightly speak of "collapse." The decline in the uninvaded territory during

[11] But possibly not to the whole territory in possession of the USSR in 1940.

[12] Unless otherwise indicated, rubles referred to in this discussion are of 1926–27 value.

the whole war (including 1945) was probably more than three times as large, in percentage terms, as the decline in Russian farm output during the war of 1914–18.

The goal for gross agricultural production in 1950 is given in Voznesenskii's speech, mentioned above, at 47.3 percent above the gross production in the very favorable year 1937, and at 26.4 percent above 1940. While the territory to which his 1940 figure pertains is a matter of guess, the 1950 figure obviously applies to the postwar territory. The prewar level of agricultural production for the enlarged territory lies at 115 percent (or slightly more) of the 1937 production in the pre-1939 territory.[13] Hence the goal of the 4th Plan implies that the prewar level is to be exceeded by more than 25 percent.

Owing to the delayed reconversion of the farm-machinery industry and the slow release of men from the armed forces after the end of the war, the recovery of Soviet agriculture was slow in the first two years of the 4th Plan Period. It is extremely unlikely that the prewar output level will be reached by 1950, the last year of that period.

PRODUCTION BY COMMODITIES

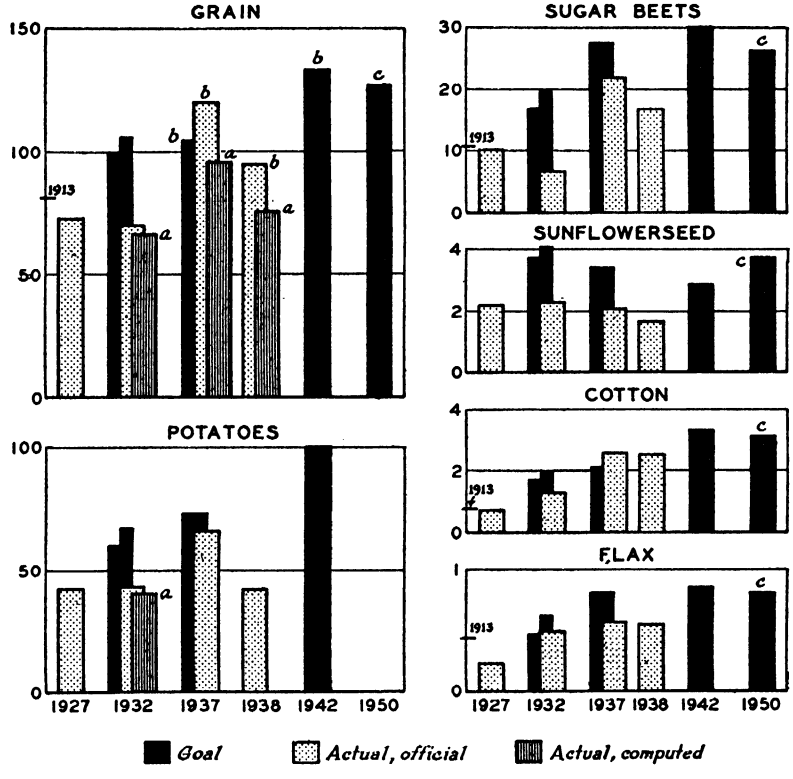
Crops.—As is always the case in times of stress, a shift from animal to vegetable products in the ultimate production of the USSR took place during the decade 1928–38. While vegetable products available for sale and consumption in the farm home increased by 2.2 billion rubles in that decade, the value of animal products declined by 0.7 billion rubles. But even the production of crops had been far from adequate; otherwise this shift would not have occurred.

Since the plans for total crop output failed greatly, the same was naturally the case with individual crops. With the single exception of cotton during the 2d Plan Period, goals were one thing and production quite another (Chart 5). If grain and potatoes came within 10 percent of their goals in 1937, this was to a considerable extent due to favorable weather. For

[13] The figure is arrived at by assuming that the prewar level of output in the pre-1939 territory was slightly below that of 1937 and that the added territories, before they were included into the Union, had an output of 18 to 20 percent of that of the Union in prewar boundaries.

some crops the discrepancies between goal and performance were even considerably larger than for the total crop output. The plans called, for example, for a large expansion in sunflower-seed production. The output, however, was not maintained even in the very favorable year 1937.

CHART 5.—FIVE-YEAR PLANS: MAJOR CROPS*
(Million tons: note different scales)



* Data in Chart Appendix.
[a] Barn crop. [b] Crop on the root.
[c] Enlarged (postwar) territory; crop on the root.

Developments in the output of individual crops were not encouraging—even apart from the failure of the plans. As Chart 5 indicates, fibers and sugar beets were the only major crops in which large increases in production were attained during the 'thirties. The USSR indeed changed from an importer to an exporter of cotton. The increase in the value of fiber production from 1928 to 1938 amounted to about 450 million

rubles. There was a large increase also in castor beans, and a start was made in the growing of kok-sagyz, a rubber-yielding plant. About 40 percent of the increase in the total value of products available for sale and for consumption in the farm home from 1928 to 1938 was made up of inedible products.

Among edible vegetable products, only sugar-beet output was greatly expanded during the decade. By 1937, production of grain, the principal food and concentrated feed crop, had increased by about 15 percent—not significantly more than the growth of population. The increase was considerably larger in potatoes (almost 50 percent), mainly because the inadequately provided kolkhoz and individual peasants and other rural dwellers sought refuge in this crop. The production of vegetables also rose more than moderately, and for a similar reason; the statistics, however, are too uncertain to permit an exact appraisal of the increase. However large it may have been, it was only a fraction of the fantastic expansion planned for these crops. A government order of November 23, 1929, applying to the RSFSR, specified increases within five years of 75 percent in the acreage devoted to the principal group of vegetables designated Type I (see page 595), and of 40–50 percent in yields (75 percent for kolkhozy and sovkhozy).

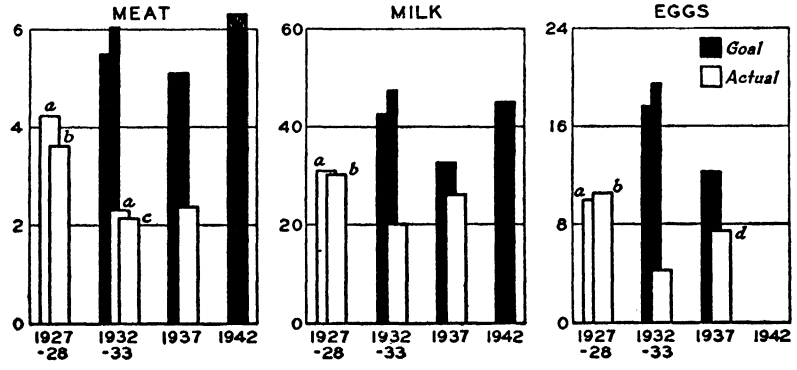
The situation was worst with vegetable oils. While output of sunflower seed declined, no substitute crops were found. Only because of an increase in oilseeds obtained as by-products of fiber production could the total oil output be approximately maintained. This was a very unsatisfactory solution in view of the population increase, the shortage of animal fats, and industry's rapidly expanding demand.

It is significant that, aside from sugar beets, the food crops that were increased the most—potatoes and vegetables—were those in which the private producers, including the kolkhozniki, produced and retained a large share of the total output.

Animal products.—The plans for animal products failed even more markedly than those for crops (Chart 6). Meat production in both 1932 and 1937 was less than half the respective goals. Egg production in 1932 probably was less than one-quarter of the maximum goal of the 1st Plan. While the pro-

duction of all important vegetable products, although falling far short of the goals, more or less exceeded pre-collectivization levels (with the exception of sunflower seed and probably hay), poultry meat is likely to have been the only animal product with an output greater at the end of the 'thirties than in 1928. The output of principal meats, milk, eggs, wool, and hides and skins had not reached the pre-collectivization level when the USSR entered the war. The meat-output capacity in 1940 was more than 20 percent below that of 1928.

CHART 6.—FIVE-YEAR PLANS: OUTPUT OF PRINCIPAL ANIMAL PRODUCTS*
(Million tons of meat and milk; billion eggs: note different scales)



* Data in Chart Appendix.
[a] Original official estimate.
[b] Later official estimate. [c] Official revision.
[d] Estimated by the writer.

These developments in animal products were the natural result of the failure of the ambitious plans for the development of livestock herds, indeed, of the failure of the productive livestock to reach at least the pre-collectivization level after the severe drop in the early 'thirties. Horses did not increase to much above half of this level. For particulars on the changes in herds, the reader is referred to pages 620–26, and especially to Charts 36 and 37 (pp. 621 and 622).

INCOME

Except for taxes, nearly the whole income from agriculture, as computed in the USSR, went to the agricultural population in 1927–28. Following are the Gosplan's estimates of the in-

come from rural economy and income of the population engaged in this in 1927–28, in million 1927–28 rubles:[14]

	Million rubles
Income from rural economy:	
Agriculture	10,409
Forestry	1,459
Fishing	360
Total rural economy	12,228
Income of the population engaged in rural economy:	
Total	13,333
The same exclusive of receipts from the cities	11,616

On this basis, about 95 percent of the income from the pre-collectivization rural economy went to the population engaged in it.

The situation changed substantially in the next few years, as the state became an important recipient of income from agriculture. Since there was practically no increase in the total in 1928–38 (Chart 4, p. 65), the portion of the income going to the farm population declined materially over the period.

Theoretically, the state should receive rent for the land in the greatly expanded state farms, as well as the profit from operating them; but the sovkhozy are high-cost producers (pp. 264–66), and it is quite possible that, except perhaps in good crop years, the rural population gets, in the form of wages, the whole return from the operation of the state farms, except for such expenses as fuel and depreciation.

The gross return of the state-owned MTS is largely absorbed by depreciation of machinery and the cost of motor fuel and lubricants, already deducted in arriving at the income from agriculture, and, to a much smaller extent, by salaries and wages which go to the farm population. The analysis in chapter xii (pp. 293–95) does not indicate that large profits accrue to the state after the expenses are met.

Although in normal years the state may not make any profit on sovkhozy and the profit on MTS probably is not large, its net gains from obligatory deliveries of the kolkhozy, kolkhoz-

[14] *Control Figures of the National Economy USSR for 1928–29*, Gosplan (Moscow, 1929), pp. 436–38.

niki, individual peasants, and other producers of farm products, and from the milling tax, are huge. According to the computations on pages 700–701, they amounted to a little more than 2 billion 1926–27 rubles on the average of 1937 and 1938. The income from agriculture of the population engaged in agriculture did not exceed 7.2 billion rubles on the average of those two years, as against 8.9 billion in 1928. Since the total population depending on agriculture was estimated to have declined by 12½ percent over the period (pp. 713–14), the per capita income of that population was reduced by almost 10 percent.

But the changes in the distribution of income from agriculture, from 1928 to 1938 and later years, were not limited to the great increase in the share of the state and to a certain reduction in the average per capita income of the population engaged in agriculture. In 1927 only 3.9 percent of all peasant households were classed as kulaki (well-to-do; see pp. 161–62). Moreover, the wealth and income of this group were considerable only in comparison with the distressing poverty of the bulk of the peasantry. In consequence of the thorough reorganization of agriculture, the percentage of persons in agriculture with higher incomes than that of the ordinary peasant was greatly increased. The former kulaki, actually the more energetic, harder-working peasants, are now replaced by the army of chairmen of the kolkhozy, tractor drivers, combine operators, and the like. These workers both number and earn relatively more than did the kulaki.[15] The increase was particularly large in the number of persons with incomes several times that of an ordinary kolkhoz peasant. The directors, assistant directors (those representing the political police and others), and high officials of the MTS and sovkhozy, including the trained technicians, add up to quite a number. The computations in chapter xxix indicate that the incomes of the rank-and-file peasants were below the average by only 3 percent before collectivization and by about 15 percent around 1938. Hence the total decline in per capita income of the rank-and-file peasants in the decade 1928–38 was equivalent to about 20 percent.

[15] The increased stratification in the village—both in numbers and incomes—is a phenomenon the importance of which is by no means limited to its effect on the incomes of the rank-and-file peasants.

The official appraisal of the changes in incomes of the peasantry as the result of collectivization is that an "immense growth of well-to-do life and culture of the kolkhozy and kolkhozniki" occurred, that the kolkhozy "have brought the peasantry a joyful life."[16] The unappreciative peasant weighs the loss of his independence and the much greater work (pp. 417–19) against his smaller income. The better schooling and medical help are not likely to be considered by him an adequate compensation.

[16] I. Benediktov, "All-Russian Parade of Socialist Agriculture," *Socialist Agriculture*, July 1939, p. 3.

CHAPTER V

MARKETINGS AND CONSUMPTION

MARKETINGS

Normally, producers sell what they do not need for themselves; if some balance is left after the needs of the non-producers are satisfied, it is exported. If a study of the agricultural economy of pre-Revolution Russia went so far as to deal with marketings at all, the author discussed not the problem of how to induce or force the producers to sell more than they did but the fact that they were compelled by heavy taxation and high handling charges to dispose of more of their produce than they could spare.

The socialized economy has thus far proved unable to stimulate output. This has given great importance to the problem of marketings, as always occurs when any economy fails to insure an adequate flow of farm products to the market. The extraction of ever greater amounts of produce from agriculture—with no hint as to whether or not the balance covers the minimum needs of the farm population—is one of the most important topics of speeches and writings of those in power. The ability of socialized agriculture to insure the marketings is praised endlessly as one of its greatest advantages.

1st Plan Period.—The increases in farm output scheduled for the 1st Plan Period were so large that, in spite of the assumption of a substantial improvement in the diet of the rural population, they justified the expectation of an increase in marketings relatively much greater than in production. While gross production was to increase in five years by 43.6 percent (basic variant) or 54.9 percent (maximum), the expected increases in marketings were 83.6 and 119.3 percent respectively (Table 3). Such greatly enlarged marketings would have permitted a material improvement of the diet in the rapidly expanding cities and a marked rise of exports as well.

TABLE 3.—FIVE-YEAR PLANS: MARKETINGS OF FARM PRODUCTS*

(Values in million rubles; quantities in million tons except as noted)

Year, goal or actual	Total value	Grain	Potatoes	Sugar beets	Oilseeds	Meat[a]	Milk and products[b]	Eggs (*billions*)	Fibers (*thousand tons*)		
									Seed cotton[c]	Flax	Wool
	A. MARKETINGS										
1913, actual[d]	...	21.31	4.73	10.85	.42[e]	1.420	5.81	6.7	738	246	72
1st Plan[f]											
1927–28, actual	2,902[g]	8.08	2.69	9.76	2.29	1.350	5.16	3.9	690	120	57
1932–33, goals											
Basic	5,327[g]	17.05	4.19	15.62	4.55	2.070	9.82	8.2	1,640	360	135
Maximum	6,364[g]	19.61	4.61	18.40	5.38	2.410	12.18	9.8	1,870	460	154
Increase (percent)											
Basic	*83.6*	*111.0*	*55.5*	*59.9*	*98.4*	*53.3*	*90.3*	*111.0*	*137.5*	*192.7*	*135.2*
Maximum	*119.3*	*142.7*	*71.0*	*88.3*	*134.9*	*78.3*	*136.0*	*151.3*	*170.6*	*298.4*	*168.3*
2d Plan[h]											
1932, actual	...	19.85	8.98[i]	6.11	.59[e]	.935	4.09	...	...	...	...
1937, goals	...	34.50	16.40	27.00	...	2.484	9.64	...	...	...	...
Increase (percent)	...	*73.8*	*82.5*	*341.8*	...	*165.7*	*135.7*	...	...	...	...
1937–38, actual[d]	...	38.00	11.69	21.50	1.28[e]	1.400	8.02	...	2,575	325	80
1938–39, actual[d]	...	36.55	8.07	16.36	1.15[e]	2.056	8.20	...	2,689	310	88

	B. Centralized State Procurements										
2d Plan[h]											
1932, actual	...	18.94	4.64	6.11	...	.680	2.10	...	1,203	287	41[j]
1937, goals	...	30.00	7.62	27.00	...	1.334	5.84	...	2,104	645	114[j]
Increase (percent) ...	...	*58.4*	*64.2*	*341.8*	...	*96.1*	*178.1*	...	*75.0*	*124.7*	*185.8*
3d Plan[k]											
1937, actual	15,700[l]	31.80	7.02	21.43	1.08[m]	1.259	4.99	1.4	2,542	274	79
1942, goals	26,000[l]	41.00	13.00	30.00	1.65[m]	2.800	9.00	2.9	3,290	500	220
Increase (percent) ...	*65.6*	*28.9*	*85.2*	*40.0*	*53.3*	*122.4*	*80.4*	*100.0*	*29.4*	*82.1*	*178.8*

* The concept "marketings" was fast changing over the years covered by the table. The marketings given in the 1st Plan were exclusive of the purchases of the rural population, even if these involved transportation over long distances. The data of the 2d Plan covered centralized state procurements, procurements from suburban farms, and sales in kolkhoz markets. Otto Schiller (*Die Landwirtschaftspolitik der Sowjets und ihre Ergebnisse*, Berlin, 1943, p. 183) believed that the products sold in the kolkhoz markets to the rural population were excluded from the statistics on the turnover in kolkhoz markets. Even in this case, the purchases of the rural population in state and co-operative stores were not deducted. The practice stated by Schiller, if it existed, was in any case temporary. The detailed enumeration of the marketable farm production in *Dictionary-Handbook on Social-Economic Statistics*, Gosplan (Moscow, 1944), p. 186, comprises not only every kind of compulsory delivery or sale, including those to the rural population, but even the food given on farms in exchange for work. The payments in kind to their employees and workers by the sovkhozy had been included in marketings for a long time. (See also S. V. Sholts, *Course of Agricultural Statistics*, Moscow, 1945, pp. 120–21.) The marketings in 1937–38 and 1938–39, reproduced in the table from *Socialist Agriculture USSR, 1938*, Gosplan (Moscow, 1939), may have again been more comprehensive in composition than those of the 2d Plan.

Dots (...) indicate data are not available.

[a] The figures of the 1st Plan probably pertain to carcass weight of the principal animals, without offal. *2d Plan* (I, 239) gave the marketings of meat of the principal animals without offal in 1927–28 at 1,246,000 tons. With reference to its 1932 and 1937 figures, the *2d Plan* (I, 387) said "carcass weight, including offal." The figures of the *3d Plan* (p. 232) are in terms of live weight, and apparently include poultry and rabbits.

[b] Milk and milk products in terms of milk.

[c] Seed cotton is unginned cotton.

[d] *Socialist Agriculture USSR, 1938*, p. 89. The source gave the figures for 1913 under the heading "Czarist Russia," but such data are usually those of 1913. The 1937 and 1938 data for animal products are for calendar years. Data for 1938–39 and 1938 preliminary.

[e] Sunflower seed only.

[f] *1st Plan*, Vol. II, Part 1, pp. 326 and 332. *Control Figures of the National Economy USSR for 1929–30*, Gosplan (Moscow, 1930), pp. 538–39, gave the following figures for marketings in 1927–28 (in tons, except for eggs): grain, 8,330,000; potatoes, 2,910,000; sugar beets, 9,190,000; oilseeds, 1,732,100; meat, 1,292,400; milk, 6,290,000; and 4.0 billion eggs.

[g] Million rubles at 1926–27 prices.

[h] *2d Plan*, I, 528–29. Marketings include centralized state procurements.

[i] Only 5.77 million tons in 1932–33, according to *Socialist Agriculture USSR, 1938*, p. 89.

[j] From *Draft of 2d Plan*, I, 528.

[k] *3d Plan*, pp. 88, 90, 91, and 232.

[l] Million rubles at 1937 prices.

[m] Sunflower seed only. The table on centralized state procurements in *3d Plan*, p. 232, gives for oilseeds 3,224,000 tons in 1937 and 4,800,000 tons in 1942 (goal). However, according to p. 89 of the same source, those figures represent the total production.

However, production actually declined substantially during this period. The natural result would have been a more than proportional decline in marketings. But the whole production-marketing relationship was changed by the all-embracing control that the government obtained over the producers' supplies. The normal procedure, that of producers selling what they do not want or need more or less urgently for their own use, was done away with. The volume of marketings was increasingly determined by the needs of the government for specific supplies (pp. 362 ff.).

Unfortunately, the writer was unable to find an official computation of total marketings in 1927–28 and 1932 in terms of rubles of the same value. However, an analysis of the marketings of individual products leaves no doubt that the total volume obtained from the farm population was not only maintained but actually increased. Although the increase was moderate—probably about 20 percent; trifling, indeed, compared with the goal—it enabled the cities and industry to survive. Death by starvation of millions in the rural districts was the price.

Marketings of animal products could not have been prevented from declining during the 1st Plan Period. With the disappearance of chickens producing chiefly for the market, sales of eggs dropped sharply. Eggs may, indeed, have represented the only important case of marketings declining relatively more than output. Meat marketings also fell considerably, though substantially less than output. Sales of milk and dairy products declined relatively moderately, also much less than output. Marketings of wool were greatly curtailed. Among vegetable products, marketings of sugar beets, the crop commonly sold in full, fell as much as production.

State procurements of sunflower seed, the principal source of vegetable oil in the USSR, declined to little more than half from 1928 to 1932 (from 1,071,610 tons to 562,680 tons);[1] part of the deficit was offset by larger procurements of cottonseed and linseed.[2] Total marketings of oilseeds probably declined moderately.

[1] *Agriculture USSR, 1935*, Commissariat of Agriculture (Moscow, 1935), p. 386.
[2] *Ibid.*, pp. 399 and 422.

Marketings of potatoes, however, rose sharply as the hungry city consumers, greatly increased in numbers, turned to the food most easily obtainable. Procurements of cotton and flax in 1932 were much larger than the marketings in 1927–28. Most important, the marketings from the 1932 grain harvest, which was at least 10 percent below that of 1927 (pp. 539–40), were almost two and one-half times those of 1927–28.

As the figures stand, deliveries of grain exceeded even the very optimistic goal of the maximum variant of the 1st Plan, but the situation was actually less satisfactory than this. The marketing goals of the 1st Plan did not include the requirements of any part of the rural population, even when they were served through normal trade channels involving long railway or water hauls. However, part of the rural population had to be fed from the supplies procured by the state in 1932, and a portion of the requirements for seed and feed for rural livestock was met from the same source. Furthermore, the urban population in 1932 was larger than envisaged in the Plan. While the 1932 grain marketings were not as large as the data in Table 3 (p. 78) imply, the withdrawal of greatly enlarged quantities from the considerably reduced crop spelled disaster to the rural population, which was poorly fed even before the Five-Year Plans were initiated.

2d Plan Period.—The increases in marketings of most products, demanded in the 2d Plan for 1937, again exceeded the planned increase in production. This occurred in spite of the fact that the supplies available to the rural population in 1932, the base year of the 2d Plan, were below the minimum needed to sustain life. When production fell considerably short of expectations, the goals for marketings in 1937 again could not be even approximately fulfilled. It would, for example, have been difficult for procurements and kolkhoz-market sales of meat to reach the goal of 2.48 million tons in 1937 when total meat production was only 2.37 million tons.[3] However, it was planned that a very large portion of the expected increase in meat production would be marketed. Actually, the producers

[3] The goal for marketings included offal, possibly also poultry and rabbits. The figure for output pertains only to the principal meats.

were forced to market not only the total small increase in meat output but much more, so that they retained for themselves less than in the meager year 1932. The rural population in 1937 parted with greatly increased quantities of meat (1,400,000 tons as against 935,000 tons in 1932) from an output enlarged only by 200,000 tons. The widely advertised and admittedly vast improvement in the efficiency of procurements is also clearly revealed in the fact that, while total meat production declined from 3.6 million tons in 1928 to 2.4 million in 1937, the marketings were about the same in both years. The quantity of meat which the rural population was permitted or contrived to retain declined from about 2.2 million tons in 1928 to only about one million in 1937 (pp. 646–47).

Great increases—relative to output, not to requirements—were also achieved in marketings of most other products. Grain marketings in 1937–38, *as officially established*, were almost double those of 1932 and more than four and one-half times those of 1927–28, thus exceeding the goal of the 2d Plan by 3.5 million tons or about 10 percent. It is proudly insisted in the USSR that grain marketings in that year were almost double those of Czarist times. The exceptional size of the 1937 crop was to only a small extent responsible for the favorable showing; the Plan would have been fulfilled or slightly exceeded even with an average harvest. By 1937 the perfection of procurement techniques had made the receipts practically independent of the size of the grain crop.

As in the 1st Plan Period, the requirements to be covered by the procured grain were further expanded during the 2d Period, not only through the rapid growth of the urban population but also through the ever increasing dependence on government grain supplies by that part of the rural population which produced insufficient grain for its own needs. In spite of these increased requirements, however, the government was able to enlarge its stockpiles greatly. A moderate additional increase in per capita grain consumption by the urban population was effected by releasing greater quantities of baked products made of lower extraction (higher grade) flour.

State procurements of oilseeds (including the cottonseed in

seed cotton) in 1937 far exceeded total marketings in 1927–28. As shown in Table 3 (p. 78) total marketings in 1927–28 were estimated at 2.29 million tons. In 1937, large factories processed 2,190,000 tons of oilseeds, all of which were certainly derived from centralized procurements. In addition, large quantities of cottonseed were delivered by the state to cotton growers, and a certain amount of sunflower seed was sold unpressed to be eaten raw.

Marketings of potatoes, however, increased from 1932 less than in proportion to the rise in output, owing in part to the difficulties experienced by all branches of Soviet trade in handling the bulky product. Still, even the marketings of potatoes were more than four times as large in 1937 as in 1927–28, while the output was only about 50 percent larger.

While the total marketings of vegetables increased perhaps two and one-half times from 1927–28 to 1937–38, little headway was made with centralized state procurements and with decentralized state and co-operative procurements from suburban farms, which had been planned on a very large scale.

Marketings of milk and dairy products (in terms of milk) in 1937, though about 25 percent short of the goal, were double the quantities marketed in 1932. Although milk production was less than that of 1927–28, marketings exceeded those of 1927–28 by more than one-third.

Eggs again proved an exception. Although marketings increased greatly in relative terms from 1932 to 1937, absolute quantities remained small—indeed a fraction of the pre-collectivization marketings.

3d Plan Period.—Only the goals for centralized state procurements were stated in the 3d Plan. As in the case of total marketings in the 1st and 2d Plans, centralized state procurements were expected to rise by more than the total output. The increase was fixed at 65.6 percent, as against the 50 percent expansion planned for gross agricultural production.

The increases in procurements planned for 1942 were relatively small in the case of grain and cotton; part of the enlarged output of grain had been scheduled for use as feed on farms, and possible procurements of cotton were limited by the size of

the crop. The large production goal for vegetable oils in 1942 (850,000 tons, or 71.7 percent above 1937) indicated what the producers of oilseeds had to expect with reference to sunflower seed. Moreover, the plan stated frankly that the proportion of the total sunflower-seed crop delivered to the state was to increase from 51.7 percent in 1937 to 58.0 percent in 1942.[4]

Huge increases in procurements of animal products were planned—almost triple for wool, more than double for meat, and double for milk.

Practically nothing came of those goals in the period prior to the Nazi invasion. The only available summarized data on marketings in the 3d Period are preliminary figures for vegetable products in 1938–39 and for animal products in 1938 (Table 3, p. 78). The most interesting figure is that for grain. Marketings in 1938–39 are given at 36.6 million tons, only slightly less than the 38 million tons marketed in 1937–38. Yet, according to the official estimates, the 1938 crop was 26 million tons smaller at least than that of 1937, and the barn crop was probably down 20 million tons (see p. 548). Thus the government continued to force the peasants to bear the impact of the large year-to-year variations in grain crops. Grain marketings in 1938–39 (almost entirely state procurements) exceeded those of 1927–28 by 30 million tons, though the barn crop was only 3 million tons larger. The government also achieved the dubious success of putting a large part of the burden of crop fluctuations on producers of oilseeds, sunflower seed marketings having declined only 10 percent in the face of a drop in production of about 20 percent.

CONSUMPTION

Soviet publications devote a great amount of space to achievements in numbers of machines, rates of mechanization, pedigreed livestock, number of experts in agriculture, and so on. The real test of success of economic progress is consumers' satisfaction, but Soviet statistics are silent on such matters as per capita consumption of food.

The following discussion is in general limited to prewar

[4] *3d Plan*, p. 90.

years. A great deterioration of the diet in the war years was inevitable. No substantial recovery occurred in the first two years after the end of the war. The meager diet of the late 'thirties will be a matter of pleasant recollection for some time to come, replacing in the memory the consumption level of the good old days before collectivization or the even more glowing promises of the 1st Plan. Probably little more than 10 kilograms of the principal meats were available per capita in 1947. This figure is about half of what was available in the late 'thirties in the present territory, and compares even less favorably with the 24 kilograms consumed in 1928, and the 33.8 kilograms projected by the maximum variant of the 1st Plan for 1932–33 in the pre-1939 territory.

Grain.—With all the additional meat, milk, eggs, and other preferred foods that the urban population was expected to consume in 1932–33, under the maximum variant of the 1st Plan, it was assumed that the per capita demand for cereal products would be satisfied with about the same amount of grain as in 1927–28. In the basic variant of the 1st Plan, per capita urban grain consumption was expected to increase but two percent.[5] Similarly, the increase in per capita rural consumption of grain was expected to be held to 5.9 percent if maximum food goals were fulfilled, and to 7.7 percent if the basic variant was achieved. In the light of subsequent developments, the very idea seems strange that the peasants would increase their consumption of bread less under the more favorable conditions implied by the maximum variant of the plan or, for that matter, that the urban population would voluntarily abstain from eating more grain products.

The annual per capita food consumption of grain in 1932 is estimated by the writer at 209 kilograms (probably too high) as against about 250 kilograms in 1927–28. Other foodstuffs, except potatoes and vegetables, were in even shorter supply, and the situation of general scarcity was aggravated by the uneven distribution of supplies. Whatever the decline in per capita grain consumption, its effect was disastrous in spite of the considerable increase in the flour-extraction rate. The ex-

[5] *1st Plan*, I, 106.

orbitant prices that people in the cities were willing to pay, and the starvation deaths of millions in the villages, are matters of record (see pp. 551–55). So also are the grain exports in these years of scarcity.[6]

The 2d Plan was satisfied to aim at restoring the per capita consumption of grain products to the pre-collectivization level. A substantial increase in the output of low-extraction flour (whiter and more palatable) was also planned. In the light of modern dietary knowledge, a high extraction of flour may seem desirable, but nutritionists seldom recommend a rate of more than 85 percent, as compared with the typical average of 70–72 percent in Anglo-Saxon countries in peacetime. In 1933 only 7.3 percent of the wheat and rye ground in large Soviet plants was milled at rates below 85 percent; most flour was of 96 or even 98.5 percent extraction. Furthermore, in countries where bread is made of nothing but flour, water, and salt (and yeast in wheat bread), where consumption of bread is large, and particularly if much of it is eaten without other foods, whole-grain bread is deleterious to many consumers. Coarse whole-grain bread, especially of rye, eaten at the rate of two pounds per man per day, adversely affects digestion and work efficiency. The 2d Plan contained a special table showing the large planned increase in the production of finer flours.[7] It was, however, believed impractical even to plan for a full return to practices of the pre-collectivization era, when large mills had produced practically no wheat flour with an extraction above 75–76 percent. Only 41.3 percent of all wheat flour ground in large mills in 1937 was specified by the 2d Plan to be of such low extraction.

Although the disastrous conditions of the winter and spring of 1932–33 were somewhat relieved with the 1933 harvest, improvement was slow. As evidence of the continued tight food situation in the whole Union, the following excerpt may be quoted from the Order of the Soviet of People's Commissars of

[6] Grain exports were huge in 1930 and 1931 (4.78 and 5.10 million tons respectively), and even in the desperate years 1932 and 1933 they far exceeded the exports of 1927–28 (1.75 and 1.71 million tons, respectively, as against .32 million). See S. N. Bakulin and D. D. Mishustin, *Foreign Trade of the USSR during Twenty Years* (Moscow, 1939), p. 35.

[7] *2d Plan*, I, 187–88.

December 22, 1933, which was concerned with measures to raise the very low labor productivity on state grain farms:

> To increase for the time of field work (from March 1, 1934 in southern areas and from April 1, 1934 in others) the daily [bread] ration of skilled workers and employees (total not to exceed 100,000 persons) from 800 to 1000 grams.
>
> To permit the People's Commissariat of Sovkhozy to provide the stated category of skilled workers and experts with 2 kilograms of meat and 800 grams of fats per month from the beginning of field work, on the condition that . . . . the yearly and quarterly plans for deliveries of meat and milk prescribed for the stated People's Commissariat will be fulfilled in full.

Even those increased quantities of foods, restricted to a limited number of adults and, moreover, allowed only during the field-work season, certainly represent near-starvation rations by all standards except such as prevail in India or China. But the people of those countries are much smaller than the Russians.

Bread rationing was abolished on January 1, 1935, but this act was accompanied by a price boost in regular government stores which brought prices of grain products to 8–25 times the pre-collectivization level.

Per capita consumption of grain around 1938 is estimated by the writer (pp. 557–58 and 751–52) at 245 kilograms—2 percent below that of 1927–28—in spite of the increased proportion of adults in the population and the fact that consumption of the other foods, except potatoes, vegetables, and the unimportant sugar, continued below the pre-collectivization level and much below the Plan. The considerably higher flour-extraction rate, however, made a greater amount of grain products available than in 1927–28. While the amount of lower-extraction flour increased moderately during the 2d Plan Period, the modest goal of the Plan was missed by a wide margin.

Grain products again began to grow scarce after 1938. Scott reported that by 1940 bread rationing was restored in Magnitogorsk in the Urals, in spite of a law prohibiting it.[8] Numerous letters found on the bodies of Soviet soldiers during the war with Finland suggest that bread and fuel were the only real concerns of the ordinary kolkhozniki. "We have nothing to complain about; we have enough grain to last until the new harvest and

[8] John Scott, *Behind the Urals* (Cambridge, Mass., 1942), p. 254.

enough fuel for the winter." This theme appeared over and over again.[9]

About 60 percent of the grain scheduled to be used for feed in the 2d Plan was actually fed in 1937, as compared with 40 percent in 1932.

Potatoes and vegetables.—The 1st Plan so confidently expected a substantially improved diet for both the rural and urban population that it displayed no interest in potatoes. It assumed that the rural population would have the same per capita consumption as in 1927–28, and that the urban population would slightly reduce theirs (see page 592). The Plan went wrong even in this. Per capita consumption of potatoes increased by perhaps 10 percent, if the consumption of the rural and urban population is duly weighted. It would have risen greatly had the potatoes been available. Feed use of potatoes declined considerably during the 1st Plan Period, instead of displaying the great increase scheduled by the Plan.

An increase in per capita consumption of potatoes of 15.4 percent was specified for the 2d Plan Period.[10] An increase occurred, but the goal of 156.8 kilograms was probably not reached. The great increase expected in feed use of potatoes only partly materialized.

As prescribed in 1930, the per capita consumption of vegetables by city workers was to be more than doubled by the end of the 1st Plan Period. The 2d Plan specified an expansion of 52 percent in the per capita consumption of vegetables by the total population, thus bringing it to the high figure of 156.8 kilograms.[11] The increase actually attained during the two periods, while not inconsiderable, could not stand comparison with the goals. Whatever the actual increase, all or most of it occurred during the 1st Plan Period when food was particularly short. During the 2d Plan Period the per capita consumption of vegetables may even have declined. A round figure of 100 kilograms may still be an overestimate for the per capita consumption of vegetables on the average in 1937 and 1938 as against the goal of 156.8 kilograms for 1937.

[9] See the collection of such letters in V. Zenzinov, *Rendezvous with the Fatherland* (New York, 1945).

[10] *2d Plan*, I, 390–91, 427.

[11] *Ibid.*

Sugar.—The following tabulation compares the annual per capita consumption provided for by the 1st and 2d Plans with actual consumption in 1927–28 and 1932 (in kilograms):[12]

1927–28, actual	7.7
Planned for 1932–33:	
Basic variant	11.9
Maximum variant	13.9
1932, actual	5.0
Planned for 1937	12.9

The production level reached by 1938 permitted a per capita consumption not much below the goals of the 1st (maximum variant) and 2d Plans, but only on the basis of the total population. Per capita consumption of sugar by the rapidly growing urban population was three times as large as that of the rural population in 1927–28.[13] Hence the increase in per capita consumption of each group separately from 1927–28 to 1938 probably amounted only to 35 or 40 percent. While the amount of satisfaction from an additional two kilograms of sugar per year for each rural dweller under Soviet conditions should not be underestimated, the nutritive value of such an addition is negligible.

The 3d Plan scheduled an expansion in sugar production from 2,421,000 tons in 1937 to 3,500,000 tons in 1942. Such an increase would have permitted raising the per capita consumption of sugar to more than twice the pre-collectivization level, but little progress was made toward that end. The 4th Plan called for only as much sugar (2.4 million tons) in the enlarged territory in 1950 as the pre-1939 territory had before the war.

Vegetable oils.—Vegetable-oil production during the period of the collectivization drive was also a great disappointment. The 1st Plan called for an increase in oil production in large factories from 342,000 tons in 1927–28 to 850,000 tons (basic variant) and 1,100,000 tons (maximum variant) in 1932–33. The 2d Plan scheduled an output of 750,000 tons, the 3d Plan 850,000 tons, and the 4th Plan (for the enlarged territory) 880,000 tons. The expected increases were to originate from two sources—enlarged output of oilseeds and a greater share of

[12] *1st Plan*, I, 104, and *2d Plan*, I, 391.

[13] B. Grinberg and A. Kovner, "Food Problems in the 5-Year Plan," *Economic Review*, July 1929, p. 54.

the large factories in the total processing. Only the taking over of a larger proportion of the crops by the large factories materialized. The output of vegetable oil in large factories, instead of reaching 1,100,000 and 750,000 tons, was only 410,000 tons in 1932[14] and 495,000 tons in 1937.[15] The total output of vegetable oil in all factories in 1938 was only slightly larger than in 1928 (p. 575),[16] and no substantial change occurred in 1937–40.

Per capita consumption of edible vegetable oils and fats declined not only because of the increase in population but also because the industrial use of vegetable oils was considerably expanded. The plans for making the people clean by a great expansion of soap production failed miserably, nevertheless.

Food consumption of vegetable oils, including margarine, in 1932 was officially reckoned at 2.8 kilograms per capita[17] (probably an overestimate)—certainly a negligible quantity for a major source of fat in the peasants' diet. That of 1927–28 may have amounted to 3.5 kilograms. The 2d Plan aimed at raising the per capita consumption of edible vegetable oils and fats to 4.2 kilograms in 1937,[18] but the consumption in 1937 was probably less than in 1932. There are no indications of an improvement in 1938 or subsequent years.

The 1st Plan prescribed an increase in the soap production of large factories, from an annual level of .94 kilograms per capita to 2.36 kilograms (basic variant) or 2.60 (maximum variant), by 1932–33. Actually, 1.7 kilograms were provided from this source in 1932. A large part of the increase from 1927–28 was merely a shift from home and small-plant production to production in large state and co-operative factories, the output of which had been very small in 1927–28. The goals of the 2d, 3d, and 4th Plans for soap production in large factories compare as follows with actual output in 1932 and 1937 (in

[14] The figure was not stated frankly, but can be computed from a statement in *2d Plan*, I, 185.

[15] J. Zhukovsky, *Rise in Material and Cultural Level of the People in the New Five-Year Period* (Moscow, 1946), p. 27.

[16] In 1927–28 around one million tons of oilseed were processed by small factories on custom account for producers or from seed purchased by the factories (*Statistical Handbook USSR, 1928*, pp. 254–55). About 250,000 tons of oil were obtained from that seed. The production of these small factories declined considerably in later years.

[17] *Draft of 2d Plan*, I, 374.

[18] *2d Plan*, I, 391.

thousand tons in terms of soap with 40 percent of fatty acids):[19]

1932, actual	357
Planned for 1937	1,000
1937, actual	495
Planned for 1942	925
Planned for 1950 (enlarged territory)	870

The draft of the 2d Plan had called for 1,300,000 tons of soap in 1937.[20] The futility of obviously unattainable goals inspired a reduction to 1,000,000 tons in the final text of that plan, and the goal of the 3d Plan—925,000 tons for 1942—implied a further cut. The plan for 1950—870,000 tons in the enlarged territory—is still optimistic when related to the prospects for supplies of vegetable oils.

While soap production fell far behind the plans during the 'thirties, there may still have been a large increase in actual output. In appraising this, however, one must take into account the vast difference between the soap consumption of the rapidly growing urban population and that of the rural population. The industrial use of soap also expanded considerably. As to the 1950 goal, one must consider that the populations of the added territories are in the habit of using much more soap per capita than the population of the pre-1939 Soviet territory.

Animal products as a whole.—With respect to consumption of animal products, the differences among the individual items were only in the degree of deprivation which marked the functioning of all three plans. There was one aggravating factor to the declines in output. As in most poor countries, the urban population consumes much more meat and eggs and considerably more milk products than the rural population. Owing to the rapid increase in the proportion of the urban population, total requirements for animal products would have expanded considerably, even if the previous levels of per capita consumption of both the urban and the rural population had merely been maintained; an unchanged output of animal products would necessarily be accompanied by a substantial decline in the rates of consumption both in cities and on farms. The same phenomenon

[19] *2d Plan*, I, 431; V. Molotov's speech to the XVIIIth Party Congress introducing the 3d Plan (*Planned Economy*, 4th issue, 1939); *4th Plan*, Section 2.

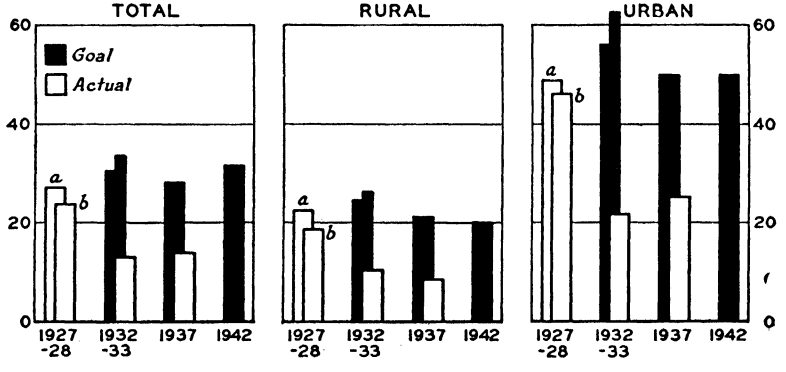
[20] *Draft of 2d Plan*, I, 415.

has already been mentioned in connection with sugar and soap, and it also appears in textiles.

Since the production of the principal animal products never again reached the pre-collectivization level, the consumption rates of all animal products in the country and the cities remained far below the pre-collectivization level, which was officially recognized as very inadequate. The Soviet Union indeed provides a unique example of industrialization and urbanization that not only lacked the normal accompaniment of a considerable increase in average per capita consumption of animal products, but actually showed a marked decline.

Meat.—The 1st Plan employed exaggerated per capita rates of meat consumption for the base year 1927–28: 49.1 kilograms for the urban and 22.6 kilograms for the rural population (Chart 7). In spite of this, the approved variant of the Plan

CHART 7.—FIVE-YEAR PLANS: PER CAPITA MEAT CONSUMPTION*
(*Kilograms per year*)



* Data in Chart Appendix.
[a] Original official estimate. [b] Later official estimate.

provided for increases of 35.4 and 16.8 percent respectively—to 62.7 and 26.4 kilograms. The 1927–28 figures were later corrected to 46.3 and 18.7 kilograms, but even these rates, to say nothing of the 1st Plan goals, must have seemed a dream of plenty to the meat-hungry populace when it received the official declaration that the 1st and 2d Plans had been gloriously fulfilled and exceeded.

In 1932, the per capita meat consumption of the whole popu-

lation turned out to be hardly more than half of that in 1927–28. The situation was even worse for the urban population, whose consumption was only a little over 40 percent of its 1927–28 level. The 2d Plan tried to hide the futility of scheduling for cities and villages a per capita meat consumption even as high as the basic goal of the 1st Plan, by including fantastic quantities of poultry and rabbits in its meat goals for 1937 (this in spite of the fact that in Russia "meat" had always meant the principal meats: see p. 638, note 1, and Chart Table 7, p. 777, note *d*). Even the reduced goals, however, remained wishful thinking. Meat production in 1937 was only a little larger than in 1932, and the per capita consumption of the whole population could barely have been maintained. The only difference, but a very substantial one, lay in the fact that the increased control over the supplies made it possible to bring about a distribution more favorable to the urban population than that of 1932. The urban dweller in 1937 had more than half as much meat as in 1927–28, while the rural population had a smaller proportion of its 1927–28 consumption. The difference in per capita meat consumption between the rural and urban populations, which had always been large, became even greater. The relationship of Czarist days was probably again fully restored.

After all the "great achievements," the 3d Plan was satisfied to project for both the rural and urban population a meat consumption in 1942 about 5 percent above the pre-collectivization level.

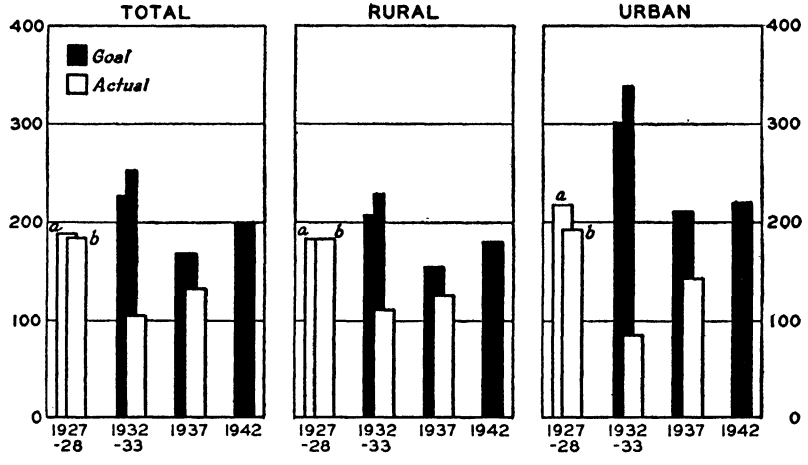
A greatly increased meat production in 1938, the first year of the 3d Plan Period, was brought about through a change from increasing to decreasing livestock herds. This raised the per capita meat consumption from 14.0 kilograms in 1937 to 20 kilograms in 1938. The greatly enlarged marketings in that year may have brought the per capita urban consumption of meat to two-thirds of the pre-collectivization level, while the consumption of the rural population was not very much above half of its corresponding level. The rural dweller may have had no more than one-third as much meat to eat as the urban, and the latter's actually deplorable position was certainly envied by the rural population more strongly than ever before. Since meat

production did not reach the 1938 level in any of the following peace years, 20 kilograms of meat per capita remains the best that the socialized Soviet agriculture could do for the consumer.

Milk.—The consumption of milk and dairy products during the collectivization period was relatively not quite so small as that of meat, but was a great disappointment nevertheless (Chart 8). The pre-drive disparity between urban and rural consump-

CHART 8.—FIVE-YEAR PLANS: PER CAPITA CONSUMPTION OF MILK AND MILK PRODUCTS*

(*Kilograms per year in terms of milk*)



* Data in Chart Appendix.
[a] Original official estimate. [b] Later official estimate.

tion had been relatively much less in milk than in meat and eggs; hence the rapid urbanization tended less to enlarge the total requirements for milk. An offsetting factor was that the need for an increase in the consumption level of milk and milk products was believed to be much greater than for meat. As in the case of meat, even the low rates of consumption of milk and milk products in 1927–28 must in retrospect have seemed highly satisfactory.

The 1st Plan in its maximum variant sought to increase the urban consumption of milk (including milk products) by more than 50 percent in terms of milk, and even the basic variant called for an increase of 38 percent. The planned increases for the rural population were more modest. The actual per capita

consumption of milk in 1932 turned out to be only about 60 percent of the 1927–28 level for the peasants, while the urban population had less than 40 percent of its pre-collectivization consumption.

Less than half of the increase in per capita milk consumption planned for the 2d Plan Period was attained.[21] To a considerable extent, though less than in the case of meat, the changes in the milk situation during the 2d Period operated to the disadvantage of the producers. While the urban per capita consumption increased by about 70 percent from 1932 to 1937, the rural consumption went up less than 15 percent.

The 3d Plan called for a 50 percent increase in per capita consumption of milk (always including milk products) by the whole population. The planned rates of consumption by the urban and rural population in 1942, if realized, would have merely restored the pre-collectivization level. Milk consumption, however, remained about unchanged in the three and one-half years that the 3d Plan functioned before the USSR's entrance into the war.

Eggs.—The per capita consumption of eggs in 1927–28, according to the Gosplan and Nifontov's later official estimate, was as follows (in eggs per year):

Population	Gosplan[a]	Nifontov[b]
Rural	49.6	46
Urban	90.7	107

[a] *1st Plan*, I, 106.
[b] V. P. Nifontov, *Animal Husbandry of the USSR in Figures* (Moscow, 1932), p. 222.

As in the case of milk, the 1st Plan contemplated quite substantial increases in egg consumption by 1932–33. While the per capita consumption of the rural population would have remained modest (70–72 eggs per year) even if the goal were reached, egg consumption in the cities (139 or 155 eggs per

[21] Except in 1930, no use was made of the possibility of alleviating the domestic shortage of dairy products by discontinuing or substantially reducing butter exports. These were as follows (in tons):

1926–27	30,295	1932	30,934
1927–28	32,920	1933	37,205
1929	25,371	1934	37,903
1930	10,522	1935	29,393
1931	30,855		

year) would have made a really good showing, bringing Soviet urban consumption up to the level of the better European countries in this respect.

The bitter reality, however, was a per capita consumption by the whole population of only 25 eggs per year in 1932,[22] and even less in 1933. Such averages obviously mean that a large proportion ate no eggs at all.

The 2d Plan projected a per capita consumption in 1937 (for the whole population) of 67 eggs—still a low figure.[23] Neither the official publication devoted to the fulfillment of the 2d Plan nor the *3d Plan* contained anything on egg production or consumption—an ominous sign. Even with exports disregarded, fewer than 30 eggs per urban dweller could have been provided from the government procurements of 1937, and their total consumption remained far below the pre-collectivization level.

The egg situation eased somewhat by 1940, when production was close to the pre-collectivization level and exports may have been smaller than in 1927–28. Still, owing to the increase in population, the pre-collectivization level of consumption per capita was missed by perhaps 10 to 15 percent even for the total population. The consumption of both the rural and the urban population must have been below that level by a considerably wider margin owing to the rise in the proportion of urban consumers.

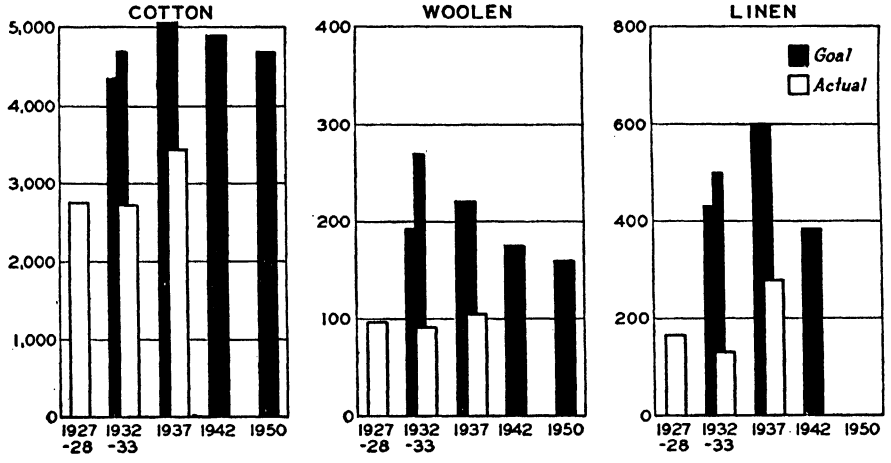
Textiles.—The large increase in the domestic production of cotton was not accompanied by a corresponding expansion of domestic consumption. Both Czarist Russia and the Soviet Union in its earlier years depended heavily upon imports of cotton. In 1927–28, for example, the Union imported 154,200 tons while producing only about 210,000 tons. Of the cotton processed in large factories in that year, 41 percent was of foreign growth. The large increase in domestic production of cotton in subsequent years not only made the Union independent of foreign cotton, but even provided a surplus. In 1937, 45,300 tons were exported and considerable reserves were accumulated in subsequent years. Cotton apparently was also used to a large extent

[22] Implied in *Draft of 2d Plan*, I, 374. Even this figure may be an overestimate.
[23] *2d Plan*, I, 391.

to make up the deficit in coarse fibers. Aside from the fact that the reduction in imports and the increase in stockpiling largely offset the increase in cotton output, domestic consumption of textiles was held down by the neglect to provide the necessary processing capacity.

As shown in Chart 9, planned production and actual produc-

CHART 9.—FIVE-YEAR PLANS: OUTPUT OF TEXTILES*
(*Million meters*)



* Data in Chart Appendix.

tion of textiles had little in common. It may even be regarded as a kind of record to have planned 500 million meters of linen goods, as for 1932, and to have produced only 130 million. But the situation was bad even if the plans are disregarded and only the actual production figures are considered.

Chart 9 shows a slightly smaller production of all kinds of textiles by the large-scale factories in 1932 than in 1927–28. Total factory production declined somewhat more, owing to a considerable reduction in the output of small-scale industry and the curtailment of home processing with the perfecting of the collecting system. As with many other goods, the per capita consumption of textiles by both the urban and the rural population was also affected by the rapid growth of the urban population with its much higher per capita consumption.

The moderate increase in the output of textiles by large fac-

tories from 1927–28 to 1937 (Chart 9) may have been offset by the decline in the output of small-scale mills and home weaving. The per capita consumption of both the rural and the urban population could in no case have been maintained. In the last prewar years the civilian consumption was further curtailed by large takings for the armed forces.

The 4th Plan, even if fulfilled, will not provide a substantial improvement. By and large, the goals for 1950 are a reproduction of those of the 1st Plan for 1932–33, when the expected population was probably one-fifth smaller. Three-quarters of a yard of woolen goods per person in a year is a modest goal for a country which claims to have overtaken all European countries in production techniques.

Concluding remarks.—The findings on consumption of the rural population tie in well with the findings on the income of the rank-and-file rural population summarized in chapter iv. They support one another. Practically the entire income of these poor people is used on food and clothing, the former demanding far the greater proportion. The deterioration of food consumption and, at best, the maintenance of clothing purchases, clearly point to decreased incomes.

The Russian urban dwellers are also poor and the bulk of their income is spent on food and clothing, the generally very low rent being an item of minor importance. In 1927–28, urban workers and employees spent 38 percent of their income on farm products and 35 percent on industrial products, probably also food in part, the balance being mostly clothing.[24] The developments with reference to consumption of food and clothing, similar to those in villages, therefore leave no doubt that the consumption level of the urban population declined in 1928–38, and deteriorated further in 1939 and 1940. These conclusions are fully confirmed by comparisons of the rise in wages with those in prices of consumers' goods.[25] Housing conditions likewise deteriorated as is demonstrated by official data on living space per urban dweller. The improvements in

[24] *Control Figures of the National Economy USSR for 1929–30*, Gosplan (Moscow, 1930), pp. 476–77.

[25] See especially S. N. Prokopovicz, *Russlands Volkswirtschaft unter den Sowjets* (Zürich and New York, 1944), pp. 283–311.

education and health services, commonly measured in expenditures from the budget in current costs and prices and therefore greatly exaggerated, could not have compensated for the other deprivations, especially since privileged groups have first access to these services. This all throws proper light on the following statement from the official Party history:[26]

> In the past, revolutions have perished as a result of the fact that, having brought the people freedom, they were unable to provide them with a significant improvement in material and cultural conditions. In this lay their fundamental weakness. Our revolution is distinguished from all other revolutions in that it gave the people not only freedom from Czardom, from capitalism, but also a fundamental improvement of their material and cultural conditions. In this lies its invincibility.

The first part of this statement may well turn out to be quite prophetic some day, considering the facts on availability of enclosed living space, food to eat, clothing and shoes to wear.

[26] *History of the Communist Party of the Soviet Union (Bolsheviks)*, ed. by a Commission of the Central Committee of the CPSU(B) (Moscow, 1946), p. 326.

PART II

BACKGROUND

CHAPTER VI

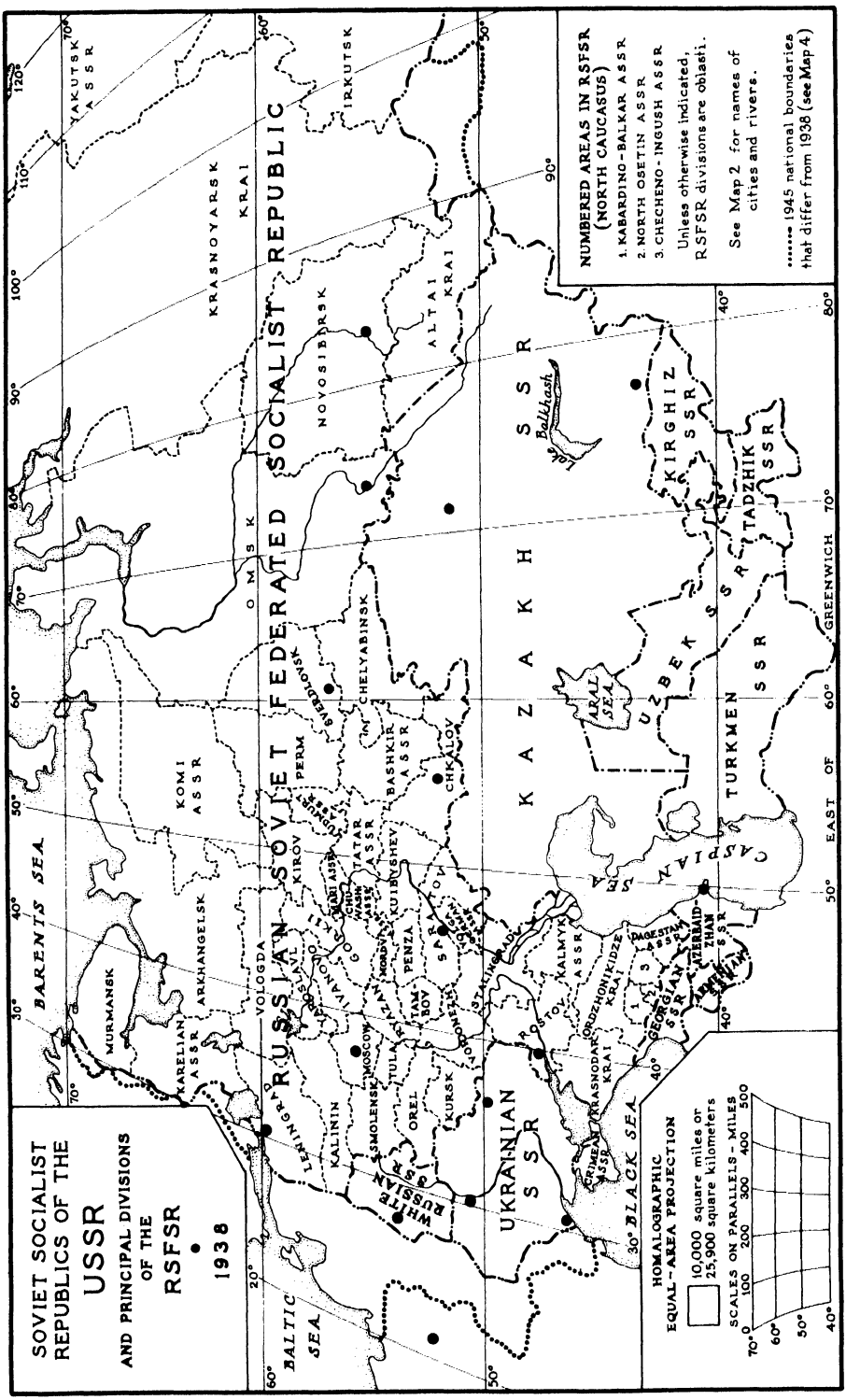
NATURAL RESOURCES AND POPULATION

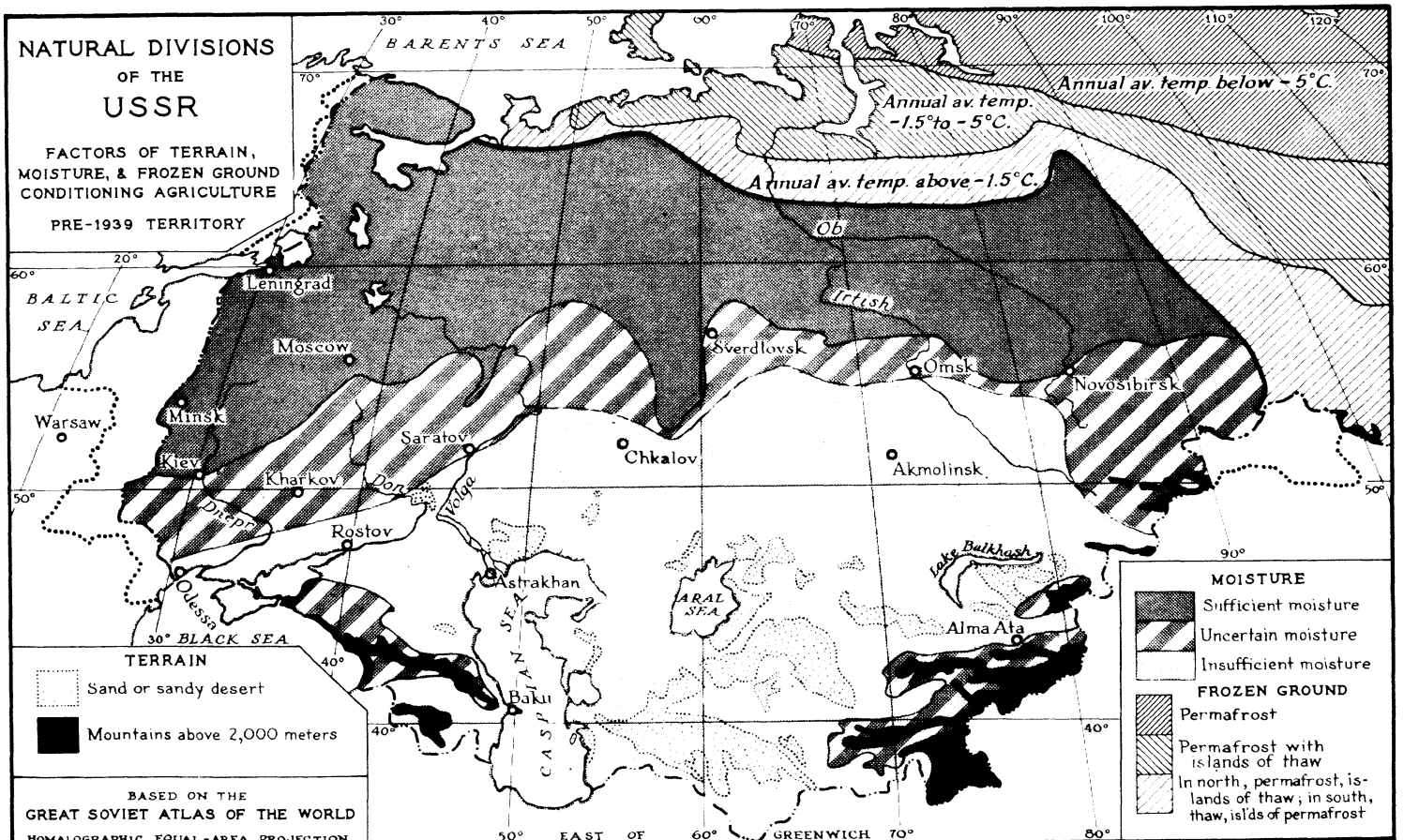
A GENERAL VIEW

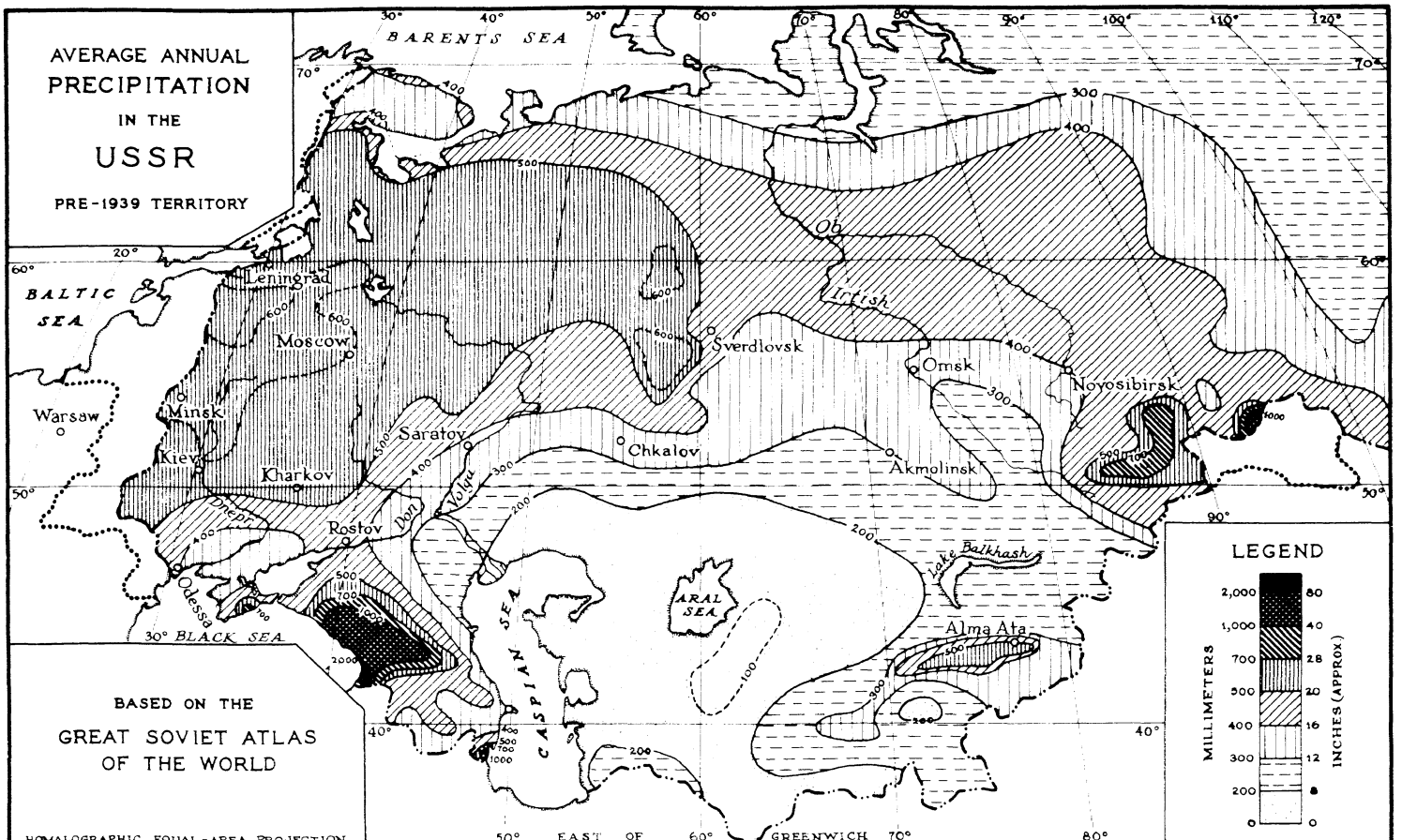
Czarist Russia was frequently referred to abroad as a country rich in natural resources. This erroneous idea, instead of being gradually dispelled, has gained in intensity and spread since the Revolution of 1917, and Soviet propaganda has done much to promote it. The discovery of considerable amounts of previously unknown mineral resources did not make a truth of this illusion. The most common error in appraising Russia's mineral resources arises from considering them in terms of absolute quantities or values, rather than in relation to the very large population. The relation of resources to the total area also is to the disadvantage of Russia. It finds its expression in the high costs of transportation over long distances. Similar errors are made with respect to several other countries, such as Mexico and Brazil.

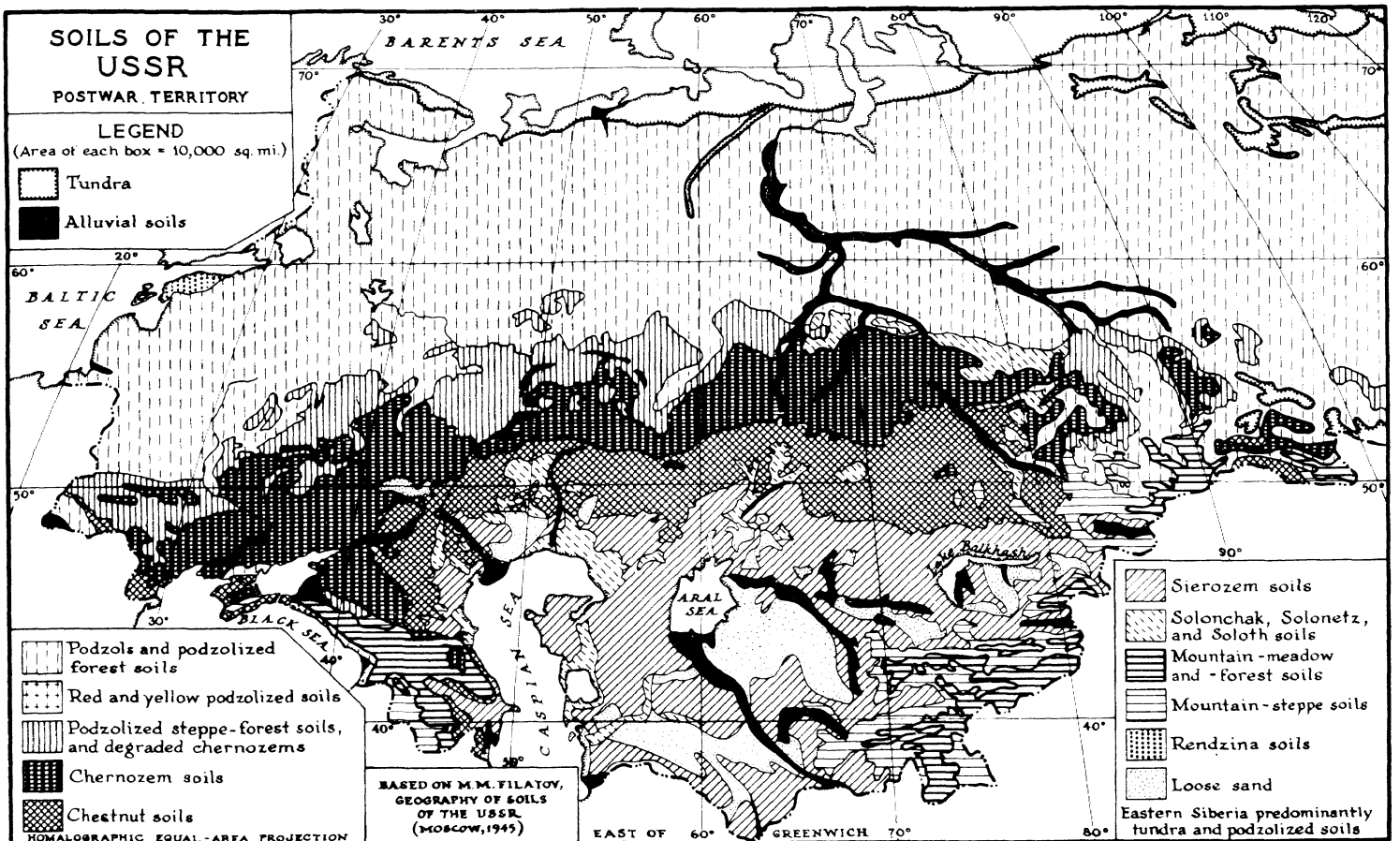
The same illusion of almost inexhaustible richness prevails with reference to Russia's agricultural resources, and the same errors of not relating the available resources to population are all too common.

The legend of the vast Russian land resources had its origin in the great stretch of proverbially rich chernozem (black soil), not equaled in size in any other part of the world. However, the inadequacy of precipitation which is associated with the chernozem definitely limits the profitable intensiveness with which this soil can be cultivated, and permits only correspondingly low returns per acre. Such land may be a relatively big asset when used in the limited way to which it is adapted, as, for example, in the Prairie Provinces of Canada or in the western Dakotas. But the limitations are a serious drawback when a dense population is dependent upon the chernozem for a much heavier production than can be obtained by the "extensive" methods of production adapted to it.


SOVIET SOCIALIST REPUBLICS OF THE USSR
AND PRINCIPAL DIVISIONS OF THE RSFSR
1938
RUSSIAN SOVIET FEDERATED SOCIALIST REPUBLIC
KAZAKH S S R
UKRAINIAN S S R
TURKMEN S S R
UZBEK S S R
KIRGHIZ S S R
TADZHIK S S R
KOMI A S S R
KARELIAN A S S R
BASHKIR A S S R
TATAR A S S R
KALMYK A S S R
DAGESTAN A S S R
GEORGIAN S S R
ARMENIAN S S R
KRASNOYARSK KRAI
ALTAI KRAI
ORDZHONIKIDZE KRAI
KRASNODAR KRAI
NOVOSIBIRSK
CHELYABINSK
IRKUTSK
YAKUTSK A S S R
MURMANSK
ARKHANGELSK
VOLOGDA
KIROV
PERM
SVERDLOVSK
KALININ
LENINGRAD
YAROSLAVL
IVANOVO
GORKY
MOSCOW
SMOLENSK
TULA
RYAZAN
KUIBYSHEV
PENZA
ORYOL
KURSK
VORONEZH
STALINGRAD
SARATOV
ROSTOV
CHKALOV
WESTERN DVINA
WESTERN RUSSIA
CRIMEA A S S R
BALTIC SEA
BARENTS SEA
BLACK SEA
CASPIAN SEA
ARAL SEA
Balkhash
GREENWICH
EAST OF
NUMBERED AREAS IN RSFSR (NORTH CAUCASUS)
1. KABARDINO-BALKAR A S S R
2. NORTH OSETIN A S S R
3. CHECHENO-INGUSH A S S R
Unless otherwise indicated, R S F S R divisions are oblasti.
See Map 2 for names of cities and rivers.
1945 national boundaries that differ from 1938 (see Map 4)
HOMALOGRAPHIC EQUAL-AREA PROJECTION
10,000 square miles or 25,900 square kilometers
SCALES ON PARALLELS - MILES
0 100 200 300 400 500


NATURAL DIVISIONS
OF THE
USSR
FACTORS OF TERRAIN, MOISTURE, & FROZEN GROUND CONDITIONING AGRICULTURE
PRE-1939 TERRITORY
BARENTS SEA
BALTIC SEA
BLACK SEA
CASPIAN SEA
ARAL SEA
Annual av. temp. below -5°C.
Annual av. temp. -1.5° to -5°C.
Annual av. temp. above -1.5°C.
Ob
Irtish
Leningrad
Moscow
Minsk
Warsaw
Kiev
Kharkov
Saratov
Rostov
Dnepr
Don
Volga
Sverdlovsk
Chkalov
Omsk
Novosibirsk
Akmolinsk
Lake Balkhash
Alma Ata
Astrakhan
Baku
Odessa
TERRAIN
Sand or sandy desert
Mountains above 2,000 meters
MOISTURE
Sufficient moisture
Uncertain moisture
Insufficient moisture
FROZEN GROUND
Permafrost
Permafrost with islands of thaw
In north, permafrost, islands of thaw; in south, thaw, islds of permafrost
BASED ON THE
GREAT SOVIET ATLAS OF THE WORLD
HOMALOGRAPHIC EQUAL-AREA PROJECTION
EAST OF GREENWICH


AVERAGE ANNUAL
PRECIPITATION
IN THE
USSR
PRE-1939 TERRITORY
BASED ON THE
GREAT SOVIET ATLAS
OF THE WORLD
HOMALOGRAPHIC EQUAL-AREA PROJECTION
BARENTS SEA
BALTIC SEA
BLACK SEA
CASPIAN SEA
ARAL SEA
Leningrad
Moscow
Minsk
Warsaw
Kiev
Kharkov
Saratov
Rostov
Oless
Sverdlovsk
Chkalov
Omsk
Akmolinsk
Novosibirsk
Alma Ata
Lake Balkhash
Ob
Irtish
Volga
Don
Dnepr
50° EAST OF GREENWICH
LEGEND
MILLIMETERS
INCHES (APPROX.)


SOILS OF THE USSR
POSTWAR TERRITORY
LEGEND
(Area of each box = 10,000 sq. mi.)
Tundra
Alluvial soils
BARENTS SEA
BALTIC SEA
BLACK SEA
CASPIAN SEA
ARAL SEA
Lake Balkhash
Podzols and podzolized forest soils
Red and yellow podzolized soils
Podzolized steppe-forest soils, and degraded chernozems
Chernozem soils
Chestnut soils
Sierozem soils
Solonchak, Solonetz, and Soloth soils
Mountain-meadow and -forest soils
Mountain-steppe soils
Rendzina soils
Loose sand
Eastern Siberia predominantly tundra and podzolized soils
BASED ON M. M. FILATOV, GEOGRAPHY OF SOILS OF THE USSR (MOSCOW, 1945)
HOMALOGRAPHIC EQUAL-AREA PROJECTION
EAST OF GREENWICH

Only a small part of all the land used for agricultural purposes in Russia is more valuable than the chernozem proper. This is the irrigated land and part of the degraded chernozem. The rest is less valuable, some of it very much less valuable. Part of the land used for agricultural purposes is definitely submarginal by standards lower than those normally used in this country. Lands so dry that they cannot be relied upon to yield three moderate crops in five years are plowed and seeded. Forest lands with shallow topsoil, needing heavy applications of lime and manure to be productive, are cleared and cultivated with only small applications of manure, or with none at all. Nor are the lands neglected that are too cold to produce anything but meager crops of spring rye.

The vast territory of the Soviet Union misleads one into thinking of great land reserves. Most of Siberia and parts of European Russia are either too cold or too dry for agriculture (p. 105). For its tremendous population (170.5 million in 1939) the Union in 1938 harvested, aside from natural hay, only 137 million hectares (338 million acres) that returned yields ranking among the lowest in the world. Two acres of such land per capita is all that the USSR could boast in that year. Since a not inconsiderable part of that land is submarginal, it is obvious that Russia does not possess substantial reserves of land which could be cultivated without great inputs of capital for improvements. When the proper yardstick is applied, Russia can only be recognized as a country very poorly endowed with land resources.

CLIMATE

Temperatures.—Most of the Soviet Union, and by far the greater portion of its agricultural area, lies north of the 45th parallel, the approximate latitude of Minneapolis. South of this line a large part of the territory consists of deserts and mountains. Thus very little of agricultural Russia extends into the southern portion of the Temperate Zone. Furthermore, Russia shares hardly at all in the marine influence that tempers the climate of Europe to the west. Even central Europe is mild in comparison with most of the USSR. Except for the limited areas

of southern Crimea and the southeastern coast of the Black Sea her climate is strictly continental, with intensely cold winters and hot summers. The increase of the continental influence on temperature from west to east in Eurasia is well illustrated by the following figures for localities at approximately the same latitudes:

Locality	Latitude	Frost-free period[a] (*Days*)	Difference between warmest and coldest month (*Degrees Centigrade*)
Utrecht, Netherlands	52° 06′	196	16.4
Berlin, Germany	52° 33′	193[b]	19.3
Kiev, Ukraine	50° 27′	172	25.3
Kharkov, Ukraine	50° 04′	151	28.3
Saratov	51° 27′	161	30.6
Orenburg (Chkalov)	51° 45′	147	37.4
Akmolinsk	51° 12′	129	37.3
Irkutsk	52° 16′	95	38.1

[a] The data on the frost-free period, which are from *World Agro-Climatic Handbook*, Chief Office of the Hydro-meteorological Service (Moscow and Leningrad, 1937, various pages), are only approximations. The figure for Saratov is obviously too high.

[b] Magdeburg.

Annual temperature ranges as great as those in eastern European Russia (Saratov, Orenburg) and western Asiatic Russia (Akmolinsk) are normal in North America only in the severer eastern part of the Canadian Prairie Provinces. In Winnipeg, Manitoba, latitude 49° 53′, the difference between the July and January temperatures averages 33.3° Centigrade, but farther west at Calgary it is only 27.2°. The climate of eastern Siberia (Irkutsk) is of unparalleled harshness.

A small portion of northeastern European Russia lies in the zone of perpetually frozen ground, while in Asiatic Russia such areas are of vast extent. Moreover, low temperatures limit agriculture for a considerable distance south of the line of perpetual frost. Between about the 90th east meridian and the maritime region of the Far East, only one small strip of very poor land lying along the southern USSR border can support agriculture, and that only on a small scale. Tobolsk, located about five degrees south of the zone of perpetually frozen ground, has an average April temperature of 0.4° Centigrade and an average October temperature of —0.1°; both months frequently show below-freezing averages, that is, below 32° Fahrenheit. Only

sporadic production of early-maturing crops is possible under such temperature conditions.

Extreme continentality of climate is a serious handicap to agriculture, especially as far north as in Russia. The severe winters restrict the growing of winter wheat, which is more prolific than spring wheat, to the western portion of European Russia; eastern Ukraine and everything east of it can grow only spring wheat. In most of West Siberia even winter rye cannot be grown successfully, while winter barley can be raised only in such places as South Caucasus where the crop is not needed.

Corn, a crop with important advantages to any country, is barred by climatic conditions from all of northern and central Russia, while in the south insufficient moisture greatly limits the extent to which it can be grown profitably.

Such crops as cotton are restricted to Central Asia and the narrow valleys of South Caucasus, the warmest portions of Russia. The recent expansion of cotton growing into North Caucasus and southern Ukraine turned out to be virtually a failure (pages 563–66). In the low-lying areas of South Caucasus near the Black Sea, citrus fruits and tea are grown, though the tea is of poor quality.

Precipitation.—Insufficiency of moisture is another important limiting factor to agriculture in the USSR. Most of Russia receives so little precipitation that agriculture is impossible (p. 106). Fortunately, a large portion of this area coincides with the zone of eternal ground freezing. However, a very large territory—including most of the four republics of Turkmen, Uzbek, Tadzhik, and Kirghiz, which in their entirety are now designated Central Asia (the former Turkestan), and extending from there well into Kazakhstan to the north and into Stalingrad oblast and Kalmyk Republic of European Russia to the northwest—is desert or desert-like, with crop raising limited almost exclusively to lands artificially irrigated. The relatively better portions of the territory are adapted to extensive nomadic and seminomadic animal husbandry. Millet, one of the most drought-resistant and earliest-maturing crops, is grown sporadically under dry-farming conditions there.

Adjacent to the semidesert along the west and north is a zone

with moisture permitting only dry-land agriculture. It is in general too dry for corn. This area averages 12 to 16 inches annual precipitation, with much variability. Millet in the driest parts and spring wheat in the better regions are grown either with considerable intervals between a few crops on the same land (the "perelog" system) or with fallow. Yields are low, and about two almost complete failures occur every five years. The strip of European Russia along the Black and Azov seas, including the level portion of the Crimea, is located in the zone of 14 to 16 inches. Conditions are better there because temperatures permit the growing of winter wheat, which requires less annual precipitation than spring wheat.

North of this area, in the 16- to 20-inch precipitation belt, the climatic conditions permit more stable agriculture, but it too is definitely a dry-farming area. Root and bulb crops cannot be grown successfully on a large scale, while grass, including that on arable land, yields only moderately. The areas with a precipitation close to 20 inches grow corn but the yields are naturally low.

North of the 20-inch isohyet is located the large zone of adequate precipitation. Within the limitations imposed by the severe winters, the area is climatically adapted to intensive farming. Potatoes and grain do fairly well there. The southwestern part with its milder climate (the Kiev region) is the best portion of the zone. Russia had to make this its sugar-beet area, although in a country with more adequate precipitation it would be unable to compete. The portion of Krasnodar oblast adjacent to the Caucasus Mountains is another good spot in this belt.

Russian technical writers frequently speak of the zones of insufficient and sufficient precipitation, the demarcation line between the two apparently being the 20-inch isohyet. The *Great Soviet Atlas of the World* distinguishes three zones—those of insufficient, of uncertain, and of excessive precipitation. The difference between the two-zone and three-zone representations apparently consists in a change of designation of the wettest zone from sufficient to excessive (ill-chosen because only a few isolated spots in all Russia can be said to have too much precipitation), and the division of the former zone of insufficient precipi-

tation into two, inadequate proper and uncertain, with the dividing line about coinciding with the 16-inch isohyet.[1] In the map on page 105 the three-zone representation of the *Atlas* is used, but "excessive" is changed to "sufficient."

SOILS

Chernozem in Russian means black soil. But chernozem as a term is applied only to black steppe soils; these owe their blackness to an abundance of humus, organic matter in a highly decomposed form. This rich supply of humus not only ensures to the crops grown on the chernozem an ample supply of nitrogen and other plant food, but gives the soil a good texture and especially a high water-holding capacity.

The northern boundary of the Russian chernozem stretches east-northeastward from about the 50-degree parallel at the western 1938 boundary, crosses into Asia at about the 57-degree parallel and continues at about this latitude eastward to about the 85th meridian (p. 107). In the south the chernozem almost reaches the Black and Azov seas and fills out the western portion of North Caucasus. The southern borderline of the chernozem approaches the Volga about halfway between Saratov and Stalingrad; from the Volga it continues eastward approximately along the 52-degree parallel.

Various types of chernozem proper are distinguished, such as heavy, ordinary, light, and southern. In general, the chernozem is heavier, and therefore better, in the northern portions of the belt, and becomes lighter to the south or southeast, in areas of less precipitation. Further differentiations among chernozems are made on the basis of parent material and other factors.

North of the chernozem belt is located a very irregular belt, called the forest-steppe in Russia. (In Canada, this type of soil is called park land.) This belt represents a transition from steppe to forest, a steppe interspersed at frequent intervals with forests (mostly deciduous), or vice versa. The soils of this belt are made up of gray podzolized soils of the forest steppe (more to the north) and degraded chernozems (more to the south).

[1] However, I. Kantyshev in "The Basic Problems in Planning the Organization of Sovkhozy," *Socialist Reconstruction of Agriculture*, October 1938, p. 66, designates the areas with 13 to 15 inches as those of inadequate precipitation, while calling the areas with 11 to 12 inches "areas subject to droughts." But this classification is certainly exceptional.

Southward and southeastward from the chernozem stretches an irregular belt of chestnut soils which, like the chernozem, are steppe soils, and in general are similar, but are even lighter than the lightest chernozems. The soils along the Black and Azov seas are of this type,[2] as are those of a large part of the Crimean peninsula. Most of the chestnut soils, however, are in the southeastern part of European Russia and in Siberia. South of the chestnut soils begin the gray steppe soils of the semidesert, the sierozems,[3] with frequent and large outcroppings of saline and alkaline soils.

The broad belts of steppe soils, in their entirety in Russia designated the Chernozem zone, are in general very uniform, the principal exceptions being the alluvial soils which lie along rivers.

North of the forest-steppe belt all the way to the tundra stretches a wide belt of forest soils, mostly represented by podzol and podzolized soils.[4] The podzols, gray soils formed on land in coniferous forests, are the poorest. They not only contain little plant food, but are mostly very acid. Unfortunately, the podzols predominate in central and northern Russia. The podzolized soils are found principally in areas formerly in deciduous forest. The best of these, as in the small eastern portion of the United States corn belt, are brown. They are fairly rich in plant food and yield well after their frequent defect of excessive acidity has been corrected by liming. The small amount of warmth is the important factor limiting the utilization of such soils in Russia, as compared with those of the eastern part of the American corn belt.

NATURAL CONDITIONS OF THE USSR AND THE UNITED STATES

The similarities in soil patterns in the USSR and the United States are easily discerned, but the dissimilarities reveal the relative agricultural potentials of the two countries more than the similarities. The reader may imagine himself in two cli-

[2] This is more clearly shown by the much more detailed *Soil Map of the European Part of USSR*, Dokuchaev Institute of Soils (Leningrad, 1930).

[3] "Sierozem" means gray soil in Russian; but, as a term, it is applied only to gray steppe soils of the semidesert.

[4] "Podzol" means leached. Podzolized soils are moderately leached, podzol soils strongly leached.

matically similar places in the United States and Russia—Salt Lake City, and Astrakhan at the mouth of the Volga River. Both cities are surrounded by desert or semidesert, with gray steppe soils dotted with large outcroppings of saline and alkaline soils. Traveling eastward from Salt Lake City he encounters a succession of soils more or less similar to those which are found in a northward or north-northwestward direction from Astrakhan. First come the chestnut soils (designated northern dark-brown soils in the United States)[5] and then the chernozems. The American prairie soils, east of the chernozem belt, are the counterpart of soils of the Russian forest-steppe, located north of the chernozem proper in Russia. East of the prairie soils in the United States are the podzolized and podzol forest soils, resembling the forest soils of central and northern Russia. Superficially, the pattern appears almost identical; but in the United States the soil zones parallel one another longitudinally in contrast to the essentially latitudinal arrangement in Russia. This implies great differences in agricultural usefulness of the two areas compared.

The differences in the location of the various soil types, in relation to one another, in the United States and the USSR, are the result of considerable differences in annual precipitation. Both Astrakhan and Salt Lake City receive about ten inches of moisture. Indiana is located in the zone of 35 to 40 inches annual precipitation, while Pennsylvania and the states east of this have 40 inches or more. By contrast, 26 inches, found in portions of northwestern European Russia, is about the highest annual precipitation encountered in the USSR.[6] Thus the spread in annual precipitation is about twice as large in the United States as in the USSR.

This great difference is of the utmost importance in explaining the soil characteristics of the two countries. In the United States, the progression of soil types from desert to podzols is brought about exclusively by the rapidly increasing precipitation. In Russia, however, the same phenomenon is the result of the combined effect of the moderately increasing precipitation

[5] *Atlas of American Agriculture* (U.S. Dept. Agr., 1936).

[6] A tiny spot on the Black Sea near the Turkish border and small strips along the Pacific Ocean are the only exceptions.

and declining temperatures. Therefore, the more distant that certain soil types are from the desert soils, the greater in general are the differences between the soils themselves and their agricultural usefulness in the United States and Russia.

The chestnut soils of North America and the USSR differ little in the use to which they are put, being devoted mainly to wheat (winter wheat so far as temperatures permit) in both countries. The same is essentially true of the chernozem soils of both countries. There is, however, a marked difference between the prairie soils of this country and their Russian counterparts, the degraded chernozems and podzolized forest-steppe soils. The prairie soils of the United States, located in a climate sufficiently warm for corn, are an asset the significance of which can hardly be overestimated. With a small outlay of labor, 50-bushel yields of corn are obtained; and on this basis a huge animal husbandry has been built. The Russian forest-steppe zone, however, is too cold for corn. The western portion of it is fairly adapted to sugar beets; otherwise it represents nothing outstanding, even according to modest Russian standards.

Nor is there any area in Russia that resembles in productivity the eastern portion of the American corn belt. The brown forest soils of this belt, though poorer in nutrients than the prairie soils, produce almost equally bountiful crops because of greater moisture. In the corresponding areas in the southern part of the Russian forest zones, producers must be satisfied with moderate yields of rye, oats, and potatoes. Greater warmth and moisture are decisive also for the much higher value of the American forest soils, located east of the small corn belt, as compared with the corresponding parts of the Russian forest belt. Moreover, the proportion of the gray podzol, the poorest forest soils of the Temperate Zone, is small in the United States as compared with the USSR.

LAND UTILIZATION

The climatic limitations on Russian agriculture are clearly reflected in the data on land utilization, which in the mid-1930's was as follows (in million hectares):[7]

[7] *Agriculture USSR, 1935*, Commissariat of Agriculture USSR (Moscow, 1935), pp. 227–28 and 1429.

Item	End of 1934	End of 1935
Total area	2,206.9	2,213.6
Arable land	223.9[a]	
Dwelling lots	13.2	
Fruits and grapes	0.5	
Vegetable gardens	5.7	230.0[b]
Separated from house lots		
Fruits and grapes	0.8	
Vegetable gardens	1.2	
Meadows	53.3	53.4
Pastures	344.1	345.1
Forests	801.2	810.9
Bushland	9.9	
Swamps	107.0	
Others	484.9	

[a] Of this, 12,300,000 hectares were irregularly used.
[b] Of this, 5,741,000 hectares were in near-dwelling vegetable gardens and 1,222,000 hectares in separately located vegetable gardens.

Only about 20 percent of the total area was in agricultural use in the stated year. The arable land made up about 10 percent of the total territory of the USSR as against 50 percent in adjacent Poland.

Arable land.—In the last prewar years, crops were harvested on about 135 million of the 230 million hectares of arable land. This does not imply, however, that another 95 million hectares of arable land is available for annual cropping. Not all of the arable land can be put in crops every year. Of the total, not less than 41.4 million hectares are in Kazakhstan—most of this semidesert, where, except with irrigation, only sporadic cultivation is possible. Seven-eighths of the land registered in Kazakhstan as arable was not harvested in 1938 (see Table 4, p. 125). Only sporadic cropping of arable land, or, in better conditions, the alternating of fallow with crops every second or third year, is feasible in some other areas as well. In Stalingrad oblast, for example, only 3.7 million hectares were harvested in 1939 out of a total of 6 million hectares of arable land.

Even where shortage of moisture is not a factor, cold climate and shortage of manure present obstacles to yearly cropping. Where conditions are relatively favorable, the proportion of arable land not cropped every year is small. The Ukraine, with a total of 28.5 million hectares of arable land, harvested 26.0

million hectares in 1938. In Leningrad, Moscow, Western, and some other oblasti, the figures for total arable and harvested land practically coincide. Large and rapid expansion of the arable land in crops at the expense of fallow is therefore not to be expected.

The irrigated land is by far the most valuable portion of the cropped plowland, not only because high yields are obtained, but also because most of it is located in the warmest regions adapted to crops not grown in other parts of Russia. Without irrigation Russia, for example, would have practically no cotton.

The irrigated cropped plowland was estimated for 1938 at 6,167,000 hectares.[8] Around two-thirds of this (4,198,000 hectares) was in Central Asia and adjacent Kazakhstan. South Caucasus had 1,081,000 hectares in that year. In all other areas only 888,000 hectares were irrigated. The area provided with irrigation canals is considerably larger than this. Shaumyan mentions 9 million hectares of such land;[9] this figure apparently pertains only to the principal irrigated areas in Central Asia, Kazakhstan, and South Caucasus. Salinization and reduction to swamp have been the principal causes of abandonment. The land abandoned annually is estimated at 80,000 to 100,000 hectares. It may also be doubted that enough water is available for all land provided with irrigation canals. Part of the irrigated land is too saline for cotton, the most valuable crop of the corresponding areas.

Meadows and pastures.—The USSR (pre-1939 boundaries) has 53.3 million hectares of very unevenly distributed meadows —a small area for such a huge country. In dry Kazakhstan 9.1 million hectares were in meadows in 1934, while the Ukraine had only 1.9 million. Of the 344.0 million hectares in pasture, 152.5 million were again found in Kazakhstan, while 47.8 million were in the very cold Yakutsk oblast. In fact, 32.2 million hectares of the Yakutsk pastures were reindeer pastures. Ukraine had only 1.9 million hectares of pasture. In the adjacent Kursk oblast, meadows and pastures together were equal to only 12.9 percent of the arable land.

[8] I. Burdiashvili, "The Office of Irrigation," *Socialist Agriculture*, August 1939, p. 100.

[9] V. Shaumyan, "Certain Irrigation Problems," *Socialist Agriculture*, August–September 1940, p. 55.

Other land.—It is significant that a huge territory of almost half a billion hectares remains unclassified. All of this is probably either tundra or desert and is devoid of any agricultural value. Forests, occupying an even greater area than the unclassified land, are largely located just south of the tundra, in areas with a short growing season and poorly adapted to cultivation. In wide areas, including important watersheds, forests had been cut off to such an extent (frequently, it is true, without making the land usable for agricultural purposes) that the climate is being adversely affected and extensive programs of reforestation have been inaugurated.

The figure of 107 million hectares in swamps, is on the surface impressive—a potential supply of agricultural land. But almost three-quarters of the land classified as swamps in the above tabulation was in Siberia, chiefly in the northern areas where settled agriculture is impossible. Almost half of the remaining swamps are in the far north of European Russia—in Karelia and the Northern Region.

LAND RESERVES

The belief that Russia has almost inexhaustible reserves of idle or pasture land, suitable for cultivation and ready for the plow, is not restricted to countries outside the USSR.[10] The same idea frequently appeared in economic writings of the early years of the Soviet regime. It is still repeated in publications of the propaganda type, which are becoming more and more the only ones permitted in Russia.[11] But informed persons were and are of quite different opinion.[12]

[10] A considerable confusion on this score was brought about by an article by C. F. Marbut, "Russia and the United States in the World's Wheat Market," *Geographical Review* (New York), January 1931, XXI, 1-21. His conclusion was that Russia "will be able to export in that year [1933] more [wheat] than the maximum amount exported in any year before the war." The 1933 crop was so bad that the USSR would have had to import that much grain to feed her population adequately.

[11] D. Shepilov, for example, speaking of the possibilities of expanding the agricultural land, wrote in a publication of the Institute of Economics of the Academy of Sciences of the USSR, "Our country possesses the richest land reserves. Limitless are the expanses of the Volga regions, Omsk, Chelyabinsk, and Altai oblasti, Kazakhstan, Far East, and other areas." *Socialist Kolkhoz Property* (Moscow, 1940), p. 93.

[12] See the detailed analysis by B. Brutzkus W. v. Poletika, and A. v. Ugrimoff, *Die Getreidewirtschaft in den Trockengebieten Russlands*, N. F. Sonderheft 67 der Berichte über Landwirtschaft (Berlin, 1932). See also V. P. Timoshenko's review of Marbut's article (quoted above), *Geographical Review*, July 1933, XXIII, 479-81.

Mesyatsev, an official spokesman, wrote in 1921:[13] "The reserves of land, usable as arable without much outlay, in the outlying parts of the country must be accepted as by and large exhausted." Bolshakov elaborated on the same idea as follows:

> . . . . Russia's land reserves for colonization have been reduced greatly and have also sharply deteriorated in quality. The chernozem zone, which spreads in Siberia from west to east in the steppe and steppe-forest belts and, together with its continuation in European Russia, was the principal basis of the whole Russian colonization during several centuries, must be accepted as exhausted. Since as early as 1910 or 1911 colonization has had to be directed to areas located either north or south of the chernozem zone with substantially poorer natural conditions.[14]

Writing a few years after Bolshakov, a well-known student of agrarian problems, Lyashchenko, summed up his analysis of the possibilities of expanding the grain-producing area in these words:

> The combined effect of all positive factors [working toward enlarged grain acreages], one would think, will more than offset the relative decline in grain acreages, which will be brought about by the expansion of non-grain acreages.[15]

There is nothing in this statement which would point to even moderately substantial reserves of unused agricultural land.

The Soviet government has made strenuous efforts to expand the arable area. Such reserves of new land as exist are located exclusively in Siberia and Kazakhstan. Construction of new railways (especially the one connecting Siberia with Central Asia), the introduction of motor transport, and a number of other factors were certainly helpful in expanding arable land there. Yet the spring-wheat area of Siberia, including Kazakhstan, increased by only 4.8 million hectares from 1913 to 1938, according to Laptev.[16] This official spokesman expressed the belief that within two or three years after 1940 the cropped plow-

[13] P. Mesyatsev, "Instead of Introduction," *On Land*, edited by a committee of the Commissariat of Agriculture, RSFSR (3d issue, Moscow, 1922), p. 5.

[14] M. Bolshakov, "Aims and Future of Colonization," *On the New Path* (Moscow, 1923), V, part 1, pp. 488–89.

[15] P. Lyashchenko, "Possibilities and Conditions of Russian Grain Exports," *Economic Review*, June 1926, p. 21.

[16] I. Laptev, "The Location of Wheat Production in the USSR," *Problems of Economics*, April 1940, p. 88.

land of Siberia could be expanded by three million hectares more, but that wheat could be grown on that land in successive seasons only for two or three years. After that a shift to the so-called perelog system would have to be made, implying considerably less than one crop in two years. Moreover, the land involved in this expansion would probably average no more than seven quintals per hectare (ten bushels per acre) when cropped. It is also noteworthy that, in Laptev's opinion, a reduction of the spring-wheat acreage was inevitable in the semiarid regions of southeastern European Russia. Spring wheat is by far the predominant crop of that area, and contraction of the spring-wheat acreage may imply a reduction in total cropped plowland exclusive of that in rotation hay which presumably will replace wheat.

Another fact to be emphasized is that plow-up of meadows and pastures may have been a more important factor in the expansion of cropped plowland in the 'thirties than were drafts on unused reserves. The ensuing shortage of natural grass necessitated the diversion of an ever-increasing proportion of arable land to rotation hay. Thus the change consisted largely in transfer of grass growing from natural meadows and pastures to arable land as a rotation crop. Replacement of natural grass by sown grasses on appropriate land is a desirable development,[17] but it does not indicate the presence of large reserves of arable land.

The colonization plans have concentrated more and more on the Far East, while the plans for expansion of arable land have had to be applied increasingly to central and northern European Russia. Of the entire 1,281,000 allotments of new land provided for by the maximum variant of the 1st Plan, 500,000 were in the Far East.[18] The climatic conditions of the Far East are very unfavorable for agriculture, but colonization there is sponsored for political reasons. The settlers enjoy numerous privileges, but the agricultural results of the colonization have been poor. Writing late in the 'twenties, Bolshakov said that only about 20 percent of the arriving colonists settled perma-

[17] See page 491 on the great but unjustified hopes associated in the USSR with the inclusion of perennial grass in rotations in areas with inadequate precipitation.

[18] *1st Plan*, II, Part 1, p. 338.

nently, and those who did remain were doing very poorly.[19] Experience in the 'thirties was no more satisfactory.

While the supply of potential agricultural land in central and especially northern European Russia is relatively large, its preparation for use is necessarily a slow process. Moreover the land not now used for agricultural purposes in those areas is in general very poor. The topsoil as a rule does not exceed 8 to 13 centimeters (about 3–5 inches), and most of it is very sour.[20] When that land is seeded without large applications of lime and fertilizer, as is now done, yields decline.[21] Yet a large part of the German lands, now returning two and a half to three times as much, were no better in the past.

Irrigable land.—It is difficult to get a clear idea of the total amount of land that could be irrigated in the USSR. The fact that no large-scale projects were planned in Central Asia during the era of the Five-Year Plans may be considered proof that, by and large, the possibilities there have been exhausted. South and North Caucasus have certain amounts of additional irrigable land. Elsewhere, additional irrigation probably is possible mainly in a limited local way, for vegetables and potatoes. Indeed, attention is gradually turning to such projects from a big undertaking planned a few years ago.

In May 1932, an order of the government and Party prescribed the construction of a huge irrigation project in the area of Kamyshin on the Volga. The plans called for the irrigation of 4.0 to 4.3 million hectares, and completion was set for 1938.[22] This project apparently was not started. In 1938 the plan was changed fundamentally, with irrigation at first to be provided only for 1.0 to 1.2 million hectares by 1947.[23] Little work was done on the project before World War II and it seems not to have been resumed after the end of the war.

The Volga irrigation project was born of political consider-

[19] M. Bolshakov, "Results of Soviet Migration for Five Years," *Economic Review*, March 1929, p. 154.

[20] M. Pavlovsky, "The Attainment of a Deep Topsoil in New Lands," *Socialist Agriculture*, July 1940, p. 69.

[21] *Ibid.*, pp. 69 and 73.

[22] For details see *Socialist Reconstruction of Agriculture*, June 1935, pp. 98–111.

[23] B. Erlikhman, "Hydroenergetic Regions in the USSR and U.S.A.," *Planned Economy*, 1938, 8th issue, p. 56.

ations: it was dated May 22, 1932, at a time of general undernourishment and on the eve of the starvation crop year 1932–33. No thought was given to the immense difficulties involved. As time passed, new difficulties arose. For the last 20-odd years the level of the Caspian Sea has been going down, with very significant adverse effects. To guard against this and, in addition, to provide the water for the Volga irrigation project, water now flowing northward will have to be diverted into the Volga. It has, apparently, not yet been decided whether enough water can be made available for both purposes. In any event, the Volga irrigation project is not a matter of the near future.

AGRICULTURAL REGIONS

The main body of agricultural Russia for a long time was subdivided into the Chernozem zone in the south and the non-Chernozem zone in the north. In this subdivision the term chernozem was used in the wide sense, in place of steppe, and the Chernozem zone thus embraced areas of chestnut, gray steppe soils, and part of the forest-steppe. The non-Chernozem zone comprised the areas with forest soils. But these two zones were distinguished only in European Russia. The Asiatic territories of present West Siberia and Kazakhstan, though forming a natural continuation of the European zones, were known as West Siberia and Steppe Krai. At present, the standard subdivision of the main body of agricultural Russia is into the zone of adequate and the zone of inadequate precipitation. In addition to the main agricultural body, a few special areas are distinguished, principally South Caucasus, Central Asia, and the Far East.

The non-Chernozem zone.—The non-Chernozem or forest zone has somewhat less than one-quarter of Russia's harvested arable land but more than one-quarter of the wild hay. Like the poor forest soils of northern portions of the Temperate Zone in other countries, the forest soils of central and northern Russia are mainly rye, oat, and potato soils. Some are too poor even for oats. Practically no wheat was grown before World War I. In the early years after the Revolution the disruption of trade channels brought about a large increase in wheat cultivation. Later the government forced its expansion. Barley is little grown,

except in the far north where the shortness of the growing season favors it. The better soils—those only moderately acid—grow clover as a rotation crop. The more northerly portion of the forest zone is adapted to fiber-flax; in the south of the zone fiber-hemp succeeds better.

The following data (in thousand hectares) for White Russia and Gorky oblast provide an illustration of the distribution of agricultural land:[24]

Land use	White Russia	Gorky
Total area	12,369	10,991
Arable land, total (1934)	3,898	3,297
Cropped plowland (1938)	3,337	2,154
Grains	2,073	1,546
Rye	911	588
Wheat	222	267
Barley	249	13
Oats	443	506
Buckwheat	148	17
Millet	16	51
Dry legumes	32	39
Technical crops	246	73
Flax, fiber	211	52
Hemp, fiber	23	11
Potatoes	633	236
Vegetables	37	23
Sown grasses	309	260
Orchards and vineyards (1934)	52	22
Meadows (1934)	2,043	658
Pastures (1934)	713	328

Rye, oats, and potatoes occupied about 60 percent of the cropped plowland in both White Russia and Gorky oblast. In 1913, White Russia had only 38,000 hectares in wheat. Potatoes are grown much more, relatively, in the west with its longer growing season than in the east.

The far north of European Russia is characterized by scarcity of arable land and relative abundance of meadows and pastures. The situation is similar in the northern portions of that part of West Siberia that is usable agriculturally. This is obvious from the following data for 1934, in thousand hectares:[25]

[24] For sources see notes to Tables 3, 4, and 5.

[25] *Agriculture USSR, 1935*, pp. 227–28.

Region	Arable land	Meadows	Pastures
Northern krai	1,547	1,976	2,181
Leningrad oblast	2,282	2,060	1,043
West Siberia	14,437	4,800	7,094
Omsk oblast	5,299	2,498	3,134

These natural conditions give a marginal advantage to dairying. In Siberia dairying is also encouraged by the great distances from the markets, which make it desirable to have the surplus in products with a favorable value/weight relation. Consequently, those areas ship considerable amounts of butter, one of the most expensive agricultural products.

The large output of potatoes in the west of the area is the basis of rather substantial hog raising.

The Chernozem zone.—The Chernozem zone is the greatest agricultural area in Russia. It comprises almost three-quarters of the total cropped plowland of the country. As in the United States, though not to the same extent, it is a wheat area. In the western part of the zone in Europe and in North Caucasus, winter wheat is the principal crop. In eastern European Russia, as well as in the whole of Siberia, only spring wheat can be grown.

The northwestern corner of the Chernozem zone is its best part, and this is Russia's principal sugar-beet area. Twenty-two inches of precipitation is rather little for such a crop as sugar beets in the comparatively warm climate of the Kiev oblast, but the country has no better area for this crop except for the irrigated lands which are needed for other crops. Kiev oblast had about 8 percent of its cropped plowland in sugar beets in 1938 (see Table 4). The concentration diminishes as the zone extends eastward. In Sumy oblast about 6.5 percent of the harvested plowland was in sugar beets in 1938; in Kharkov oblast, somewhat less than 4 percent.

The area in North Caucasus immediately adjacent to the mountains (southern portions of Krasnodar oblast[26] and Ordzhonikidze krai) is another favored section of the Chernozem zone. The mountains insure a larger precipitation than in most other portions of the zone, and the area is also much warmer.

[26] For data on Krasnodar oblast, see Table 4.

TABLE 4.—CHERNOZEM ZONE: LAND IN AGRICULTURAL USE IN SPECIFIED AREAS*

(Thousand hectares)

Land use	Kiev	Krasnodar	Saratov	Kazakhstan
Total area (end 1934)	...	...	...	274,311
Arable land, total (end 1934)	...	...	...	41,435
Arable land, harvested (1938)	2,100	3,813	3,347	6,107
Grain	1,427	2,584	2,729	5,329
Rye	336	5	701	200
Winter wheat	377	1,351	54	155
Spring wheat	3	149	1,236	3,253
Oats	210	168	293	578
Barley	210	349	129	362
Buckwheat	107	0	3	2
Millet	63	2	218	734
Corn	10	364	0	14
Dry legumes	112	10	95	5
Technical crops	219	548	259	346
Flax, fiber	16	...	...	...
Hemp	9	...	1	4
Sunflower	7	263	209	149
Sugar beets	161	18	4	14
Cotton	...	51	...	110
Potatoes	192	56	61	102
Vegetables	50	98	37	59
Sown grasses	185	470	234	241
Orchards and vineyards (end 1934)	...	...	...	15
Meadows (end 1934)	...	...	...	9,131
Pastures (end 1934)	...	...	...	152,524

* Data on harvested arable land (1938) from *Cropped Plowland USSR, 1938*, Gosplan (Moscow, 1939), pp. 16, 299–300, 307–08, and others. Other data (end 1934) from *Agriculture USSR, 1935*, pp. 227–28. Data on total area for 1934 given in the source could be used only for Kazakhstan because territorial changes occurred between 1934 and 1938 in the other regions shown in this table.

While growing a great deal of winter wheat, the area has a large share of the USSR's tobacco land. It is one of Russia's corn-growing centers and is also an important sunflower producer. From here corn stretches westward. It is grown in all of Ukraine except its most northern and southern portions; the north is too cold and the south too dry.

The sunflower has proved better adapted to dry conditions than corn, and it has also penetrated farther north. From North Caucasus the sunflower extends into Stalingrad and Saratov oblasti and is important as far north as Voronezh oblast. From

Saratov it penetrates into Siberia, although it is not doing well there (pages 576–77). In the Ukraine it is found mainly on the chestnut soils close to the Black and Azov seas.

In the prewar decade, cotton was introduced into the North Caucasus and southern Ukraine. Yields were very low, but cost considerations were subordinated to the desire to increase the supply of domestically grown cotton.

Saratov oblast may be used as an example of the conditions in southeastern European Russia (Table 4). A large part of its chernozems are of the light type with relatively little humus. Much more important, it is an area of insufficient, highly variable precipitation and high summer temperatures. Southeast winds, blowing from the desert, are particularly damaging. More than one-third of the harvested plowland is in spring wheat. A great deal of rye is also grown, but mainly in the northern part of the oblast. The acreage in potatoes is less than 2 percent of the total cropped plowland; the potato indeed is a garden crop there, rather than a field crop. Attempts to expand corn growing have proved rather unsuccessful.

The proportion of the agricultural land in meadows and pastures is too small in the typical chernozem areas to make dairying a profitable enterprise. Animal husbandry is greatly subordinated to crop production. Hogs kept or finished on barley and corn, products of arable land, are the principal livestock enterprises in the Ukraine and some other parts of the zone.

Conditions change fundamentally, although gradually, east and southeast of Saratov oblast. The type of farming practised close to the desert is illustrated by the data for Kazakhstan (Table 4). In 1938, this vast republic had 4.4 percent of the total cropped plowland of the USSR and an even smaller share in crop production, but (in 1928)[27] 13 percent of all horses, 10.5 percent of all cattle, and 18 percent of all sheep and goats. Kazakhstan's main surplus products are wool and meat. Twelve percent of the cropped plowland of Kazakhstan in 1938 was in drought-resistant millet; this constituted 17 percent of the entire millet area of the USSR. Still, the leading crop of Kazakhstan

[27] Pre-collectivization data for livestock are used as more correctly reflecting normal conditions (see pp. 633–36).

was spring wheat, which occupied slightly more than half of the cropped plowland in 1938.

Special regions.—The special regions, excluding East Siberia,[28] have an aggregate area of ten million hectares of harvested arable land, or 7 percent of the total of such land.

Southern Crimea, protected by mountains on the north, has a climate transitional to the Mediterranean type; this tiny area produces good wine and delicious fruits.

The several times larger but still small strip between the mountains in South Caucasus, comprising Georgia, Azerbaidzhan, and Armenia (Table 5), is very warm for its latitude,

TABLE 5.—SOUTH CAUCASUS: LAND IN AGRICULTURAL USE*
(*Thousand hectares*)

Land use	Georgia	Azerbaidzhan	Armenia
Total area (end 1934)	6,431	7,805	2,965
Arable land, total (end 1934)	1,206	1,993	619
Arable land, harvested (1938)	986	1,092	437
Grain	849	783	362
Winter wheat	262	444	108
Corn	394	8	1
Rice	0	25	1
Technical crops	51	217	31
Cotton	2	195	17
Tobacco	21	5	3
Potatoes	23	14	12
Vegetables	19	25	6
Sown grasses	39	45	24
Orchards and vineyards (end 1934)	97	65[a]	19
Meadows (end 1934)	170	169	139
Pastures (end 1934)	1,649	3,148	1,446

* Data on harvested arable land (1938) from *Cropped Plowland USSR, 1938*, pp. 13–14. Other data (end 1934) from *Agriculture USSR, 1935*, p. 228.

[a] Incomplete.

thanks to the protection of the high mountains on the north. The westernmost portion receives adequate moisture. The eastern portion has to rely largely on irrigation, for which the conditions are favorable. South Caucasus, adjacent to the Black Sea, is the principal citrus-fruit and tea area in the Soviet Union. In tobacco production, Georgia is second only to Krasnodar oblast

[28] East Siberia had 1.6 million hectares of cropped plowland in 1938.

in North Caucasus. The irrigated land of Azerbaidzhan and Armenia is used mostly for cotton, although some rice is grown in the former. About 20 percent of Azerbaidzhan's cropped plowland is in cotton. Throughout South Caucasus excellent fruits are grown. Although the long distances to consumer markets are a great handicap, in Georgia orchards and vineyards comprise an area almost ten percent as large as that of harvested plowland. There is plenty of opportunity for sheep raising in the Caucasus Mountains.

The agricultural areas of Central Asia (Table 6) are located

TABLE 6.—CENTRAL ASIA: LAND IN AGRICULTURAL USE*

(*Thousand hectares*)

Land use	Uzbek[a]	Turkmen	Tadzhik	Kirghiz
Total area (end 1934)	40,952[b]	44,365[c]	14,328	19,863
Arable land, total (end 1934)	4,981	991	1,266	1,955
Arable land, harvested (1938)	2,832	410	800	1,021
Grain	1,453	189	576	799
Wheat	986	133	408	466
Barley	310	35	131	186
Rice	80	3	8	6
Technical crops	1,002	166	162	113
Cotton	917	154	110	64
Potatoes	20	2	8	13
Vegetables	64	16	13	8
Sown grasses	292	37	40	86
Orchards and vineyards (end 1934)	68	7	17	6
Meadows (end 1934)	880	64	22	436
Pastures (end 1934)	9,191	38,350	5,612	11,158

* Data for harvested arable land from *Cropped Plowland USSR, 1938*, pp. 15–17. Other data from *Agriculture USSR, 1935*, p. 228.

[a] Kara-Kalpak ASSR became a part of Uzbek in 1936 (E. M. Murzaev, *Central Asia*, Moscow, 1947, p. 9) and its data on harvested arable land are included in the figures given. Total area and total arable land (1934 data) have been adjusted to include Kara-Kalpak, except as indicated in the following note.

[b] Of this, 3,478,000 hectares in Uzbek were irrigated. Irrigated land in Kara-Kalpak not included.

[c] In addition, 1,040,000 hectares were not distributed according to use.

in a semidesert, and most crops are grown under irrigation. Of the four component republics—Uzbek, Turkmen, Tadzhik, and Kirghiz—the first is the most important. Because of limitations on the amount of water available for irrigation and the high cost of irrigation works, only a small part of this huge region is utilized for non-nomadic agriculture. The same is

true of the adjacent territories to the north. Central Asia is the principal cotton-growing region of the USSR. In 1938, about 25 percent of the harvested plowland was in this crop. Climatic conditions also favor fruit growing, but distances to consumer markets are even greater than from South Caucasus. The area is famous for its alfalfa seed. The unirrigated land supports a large sheep population.

The Far East has a monsoon climate. The monsoon arrives late, frequently not before June is well advanced, and consequently is a great handicap to the growing of spring crops. Yet only these are grown because fall-season crops would be at an even greater disadvantage, owing to severe winter frosts and heavy rains during the harvest season. In spite of great efforts of the Soviet government to expand agricultural production, the area has only about one million hectares in low-yielding crops other than hay, and is unable to feed its small population. The Soviet Far East is the area of the northernmost penetration of the soybean on the Asiatic mainland, but this crop is grown only in the southern part of the region and to a very limited extent.

LAND RESOURCES AND POPULATION

Population.—Soviet Russia counted the imposing figure of 170.5 million people in the census of January 17, 1939. Moreover, before the collectivization drive it had ranked among the countries with the highest birth rates and most rapid population growth. The following rates per thousand are for European Russia:[29]

Period	Births	Deaths	Population growth
1911–13 average	45.5	28.6	16.9
1925–27 average	43.7	21.4	22.3

In later years rapid population growth existed more as an unrealized potential. In the early 'thirties the all-out collectivization and industrialization drive, accompanied by the "liquidation of the kulaki as a class," brought about a substantial drop in the birth rate and a similar increase in deaths. The return of more normal conditions almost restored the pre-collectivization

[29] *Statistical Handbook USSR, 1928*, Central Statistical Board (Moscow, 1929), p. 74.

status, in spite of a great increase in the proportion of the urban population. For the apparently most favorable year 1938, a birth rate of 38.3, a death rate of 17.8, and a rate of population growth of 20.5 per thousand were indicated or implied in articles of high Soviet officials.[30]

While the complete silence on the situation in 1939 and 1940 supports the conclusion arrived at by analysis of age composition[31] that the population growth declined, the level remained high nevertheless. At the entrance of the USSR into World War II the pre-1939 territory probably had a population of 178 million, while in the 1945 territory the population may have been no less than 200 million.

World War II brought about a substantial net decline in population and the population growth, if any, was but small after the end of the war. At the end of 1947 the total population may have been below 190 million, rather than substantially above as indicated by Alexandrov's figure (193 million) for the end of 1945.[32] The population in the pre-1939 territory exceeded that of 1930 by 8 percent at the most.

The rates of population growth of Czarist and pre-collectivization times, or of 1938, seem to be a matter of the unreturnable past. The rate may nevertheless again become substantial, provided living conditions become bearable.

According to the census of 1926, the rural population accounted for 82.1 percent of the total. Owing to the great industrialization in the following years and the heavy loss of life among the peasants through starvation, especially in 1932–33, the rural population declined to 67.8 percent of the total by 1939. Even then the rural population comprised 114 million people, of whom about four-fifths were engaged in agriculture (see also Appendix Note A). No later data, unfortunately, are available on this score.

Land resources related to population.—After the preceding discussion of the extent and nature of the Soviet Union's land

[30] No vital statistics have been released since 1938. See Frank Lorimer, *The Population of the Soviet Union: History and Prospects*, League of Nations (Geneva, 1946), p. 134. The assumption that 1938 was the most favorable year is based on the fact that the data were published only for that year.

[31] Dr. E. M. Kulischer drew the writer's attention to this factor.

[32] G. F. Alexandrov, speech at the anniversary of Lenin's death, *Pravda*, Jan. 22, 1946

resources, no one could accept the figure of 15.8 persons of rural population per square mile on January 1, 1931,[33] as implying that Russia is well supplied with agricultural land. This is merely an average made up of such extremes as 0.3 person of rural population per square mile in the huge Yakutsk Republic and 170 persons in the Ukraine west of the Dnepr River. When land resources are brought in relation to the population, the USSR must be recognized as a heavily overpopulated country. Indeed, in large parts of Russia rural overpopulation had become acute as early as the 1880's. The subsequent rapid growth of the rural population aggravated the situation considerably, because industrialization and migration to less densely populated areas could absorb only part of the huge yearly growth.

The northern part of the Ukraine west of the Dnepr is certainly the best agricultural region of the main body of agricultural Russia. The southernmost part of the Ukraine, however, is semiarid, has therefore only chestnut soils, and permits only very extensive methods of cultivation. For the whole of the Ukraine in 1931, the record of 170 persons per square mile, or 27 persons per 100 acres, implies an excessive rural population.

The so-called Central-Chernozem region, roughly comprising Orel, Kursk, Voronezh, and Tambov oblasti, was also overpopulated, with 144 persons of rural population per square mile in 1931. Although this region has the best chernozem in the world, the eastern part of it is too cold for winter wheat and too dry for large-scale potato production; hence it must concentrate on rye and oats, two quite unprofitable crops.

Eighty persons of agricultural population per square mile in White Russia (in 1931) were too many, for large stretches of land are in forests and swamps and the land in agriculture is of very poor quality. The Lower Volga region was overpopulated with only 34 persons per square mile. The climate there permits only spring wheat to be grown by extensive methods with low yields.

The unfavorable land situation relative to population is ag-

[33] This density was about the highest ever attained. The density of the total rural population, computed on the basis of the 1939 census, was 14.0 per square mile.

gravated by the rural population's backwardness and especially by the absence of large domestic consumer markets for farm products *at remunerative prices.* In time this, of course, can change, but the great limitations of climate will remain. Semideserts, unless artificially irrigated, can be used only for extensive pasturing. The richest soils in the semiarid areas must continue to be used for grain growing by extensive methods, however high the agricultural techniques. The same is largely true of the chernozems. Future gains in Russian agricultural output will have to be largely on the poor soils of central and northern European Russia. With a great deal of manure, made available by the development of a large domestic market for animal products, and with heavy applications of commercial fertilizer, these lands may gradually be made to produce almost twice the yields now obtained in the "rich" Ukraine. But because of the cold climate those lands will always be inferior to similar lands further west, such as in Poland or Germany.

Very limited natural resources in relation to population constitute one of the major reasons for the small progress made by Soviet agriculture since World War I. Those who prepared the ambitious plans for rapid expansion in all economic activities, including agriculture, should have taken these limitations into account. In any case, after the failure of the plans became obvious, one would expect that the fact of the limited resources would be stressed, if not overstressed, to extenuate the meager progress. Instead, there is a disposition to deny both the failure of the plans and the limitations to rapid expansion. This attitude can be observed in many other aspects of the Soviet economy. Foreigners are expected to believe the claims of both vast natural resources and great success in fulfilling the plans. Neither exists.

CHAPTER VII

LAND TENURE AND DE-STRATIFICATION[1]

Serfdom in Russia ceased to exist in 1861, two years before the emancipation of slaves was proclaimed in the United States. Although American agriculture has made tremendous progress since 1863, the South still bears the scars of slavery. Where would the agriculture of the United States be now, had it depended entirely for its advancement on the South? The South itself, backward as it is and especially as it was for the first half-century after slavery ended, would be even more backward now had it not been continually influenced by the adjacent territory populated by farmers who were among the most progressive and energetic in the world.

The situation in Russia was more unfavorable. There serfdom had not been confined to a limited area as in the United States, but had existed in most of the country for centuries. When Emancipation finally came, Russia was an extremely backward country—politically, culturally, and economically. The liberated serfs were not made equal subjects under the Czar, but a special class was formed of them—a class beneath all others, and far below that of former serf owners. Under these circumstances, no rapid progress could be made in any branch of the economy. Least of all could it be made in agriculture which was most dependent upon the peasants and their former owners. The Czarist government certainly did little to foster advancement of agriculture, and the former serf owners and serfs could not be relied upon for much initiative or enlightened activity. Though considerable progress was made in spite of all these handicaps in the half-century before World War I began, Russia could not close the gap between its agriculture and that of more advanced countries.

[1] By the time this volume is published, V. V. Gzovsky's *Soviet Private Law* will be available which contains a much more detailed and well-documented discussion of the legal issues pertaining to land tenure and related problems.

The backwardness of Czarist Russia is reflected in the fact that only 51.1 percent of the population over 16 years of age were literate at the end of 1926 (boundaries of that year),[2] and many of those classed as literate could barely sign their names. So far as concerns agriculture specifically, the backwardness was revealed in everything—land tenure, farm techniques, yields per hectare, quality of livestock, incomes, diet of the peasants, composition of exports, and so on. Indeed, the discussion of pre-Revolutionary Russia must deal to a very large extent with backwardness.

PRE-REVOLUTION LAND TENURE

The village commune.—Land ownership in pre-Revolutionary Russia was rather complicated. The major subdivision of the land was between private (literally privately owned) and peasant or allotment land. The private land was owned either individually or collectively. The allotment land was always owned by a group, the village commune. But only the land obtained by the village commune in connection with Emancipation (from serfdom), or land that was proclaimed equivalent to this, was allotment land. The peasants' communes gradually acquired other land as well. Such land, though it was distributed among the members of the village commune in the same way as the allotment land, did not become allotment land, but retained its status of private land.

The principal type of village commune was that with the right of repartitioning the land. Some of the communes, confined almost exclusively to the western and southwestern areas,[3] did not possess this right of repartitioning, the members holding the communal land in hereditary tenure. In 1905, 23.3 percent of all allotment-holding households in 50 gubernii (provinces or "governments") of European Russia held their allotments by hereditary rights.[4]

The various kinds of land belonging to the village commune were administered in different ways. Each household in the

[2] S. Sulkevich, *Territory and Population of USSR* (Moscow, 1940), p. 17.

[3] G. T. Robinson, *Rural Russia Under the Old Regime* (New York, 1932), p. 71.

[4] *Ibid.*, p. 120.

first place received an allotment for permanent use—normally in the village—for the house and its usually adjacent garden. Each household, furthermore, had its allotment of arable land and meadow land, while the pasture land remained in communal use, the commune providing the herdsman.

The operation of the arable and meadow communal land by individual households on a temporary basis was of course not propitious for agriculture. The peasants were interested only in improvements from which they were to receive the returns. But this disadvantage of communal ownership of the land associated with private operation of it was far less serious than the unfavorable effect of other factors connected with the allotment system, especially since the latter factors operated in communes both with and without the right of repartitioning.

The allotments of arable and meadow land in both types of communes were typically in strips. The arable land of the communes was subdivided into fields, and each household received one strip or several in each field. While the number of strips per household usually was moderate in the South and Southeast, it was large in Central Russia and still larger in the Northwest and North. An authoritative source gave the following data (in percent of all households):[5]

Number of strips per household	South and Southeast[a]	Orel district, Orel guberniya, Central Russia	Northwest[b]	Mologa district, Yaroslavl guberniya, Northern Russia
Not more than 5	27.6	13.1	1.7	..
6 to 10	49.3	13.8	2.0	..
11 to 20	16.7	27.3	10.5	1.4
21 to 40	4.1	33.9	32.9	24.3
41 to 60	0.2	8.0	25.6	56.7
61 to 100	0.0	5.9	19.6	17.5
Over 100	0.1	1.0	7.7	0.7

[a] As characterized by conditions in one uezd (district) of Tavricheskaya, Kharkov, and Samara gubernii each.

[b] As characterized by conditions in one district of Pskov, Smolensk, and Tver gubernii each.

The fields were not fenced, and stubble and fallow lands were pastured by all members of the village commune in the

[5] P. Pershin, "Forms of Land Tenure," *On Land*, ed. by a Committee of the Commissariat of Agriculture, RSFSR (1st issue, Moscow, 1921), p. 54.

same way as the communal pasture land. This necessitated the removal of crops from the fields by all strip holders before a certain date. The plowing of fallow land likewise could not start before a given date. In other words, the form of land tenure was associated with a compulsory crop rotation for each field, a rotation prescribed by the commune.

These strip holdings, compulsory rotation, and compulsory pasturing of the fallow and stubble lands were obviously a considerable handicap to improvements. They meant perpetuation of the three-field system, which was practiced by the peasants in most of Russia but which, for the most part, had become incompatible with the density of population already attained. Moreover, while too much land was in fallow, most of the fallow received very inadequate treatment.

The Russian terminology distinguishes between green fallow, i.e., fallow used as pasture until or almost until seeding time, hence uncultivated and therefore of green color; and black fallow, i.e., repeatedly cultivated and therefore displaying the natural black or dark color of the earth.[6] It is well known that, especially in areas with inadequate precipitation, timely turning of the stubble on fallow land and keeping it "black" and free of weeds by repeated cultivations is indispensable for starting the accumulation of soil moisture and insuring an adequate yield of the succeeding crop. However, green fallow was almost universal in peasant Russia.

The adverse effects of compulsory rotation were clearly reflected in the small acreage in potatoes, potentially a very important crop in areas with adequate precipitation for its growth (see chapter vi on climatic zones), and in an almost negligible acreage in rotation grass.

While the holders of the allotments were considerably restricted in the choice of crops, time of planting, and other matters, they operated their strips of arable and meadow land individually with their own or hired livestock and machinery. Most of them did not mind the restrictions upon rotation, not knowing anything better. But all prized the fact that the produce of their own hands became their own and nobody else's property.

[6] "Black fallow" now strictly means fallow plowed in the preceding fall; that plowed in the early spring and thereafter kept clean is "clean fallow."

The reapportionment in village communes having this right occurred at the discretion of the communes, but the law of 1893 prohibited repartitions more often than every twelve years. This regulation made legal a tendency already prevalent among the communes with repartition rights. Most such communes, indeed, showed a strong disposition to resort to repartition rarely, or partially, if at all. Around 1900 the proportion of the village communes which had not practiced repartitioning, or had made only inconsequential readjustments since Emancipation, included something like one-fifth of all those peasant households in European Russia which held their lands in repartitionable tenure.[7] Another official estimate, pertaining to a slightly later date, gave a still higher figure. If the allotments held hereditarily and those in communes with the right of repartitioning but not practicing it are added together, the proportion of households in communes which did not practice repartitioning was not much less than one-half of the total number of all peasant households around the turn of the century.

The principles varied on which the size of the allotments to individual households was based. Subdivision of the land according to requirements was far predominant. There is no doubt that in spite of the tendency against reapportioning, deep in the peasants' soul was embedded the idea that the land was God's and only those were entitled to use it who needed the proceeds and could work the land with their own hands. With reference to the allotment land, this principle led to the so-called consumer's basis of apportioning. Its most vivid realization was the apportioning of the land in proportion to the number of "eaters," or "souls," but sometimes it was only the men "souls." This principle would probably have been universal if most of the peasants' land had not been burdened with debts to the state in connection with Emancipation as well as with taxes. Since the village commune was responsible for the payments of both, its concern was to have the land in such hands as were able to bear their share of the payments. Hence the worker, or the man worker, was employed to a certain extent as the unit for

[7] Robinson, *op. cit.*, p. 122.

establishing the total number of allotments due to each household.

The village commune was administered by the mir, which was an assembly of all heads of households, and had a starosta (oldster) as its head. Although the actual farming was performed individually, the commune played a rather important role in the economic life of the peasants. As stated, in addition to administering the communal land and deciding upon the rotation, the communes bought or rented other land. Communal renting of forest land (of which peasants were frequently short) with payment of work was quite common, and the commune had to see to it that the work was done.

The village commune was also a political body. It was responsible for payments for the land and for taxes. The dependence of the peasants on the commune or a group of communes (volost) went so far that until 1906 the peasants were limited in their movement by the right of the commune to refuse them their passports, without which nobody was supposed to leave his place of permanent residence in Czarist Russia. Among other things, the commune had to keep the roads in order. The relation of the peasants to the commune was indeed rightly characterized as bondage. The purchased and rented land, the payments involved, the so-called road duties, and similar rights and duties were subdivided among the households on the same basis as that in which the allotment land was held.

The reader may have noticed that the writer speaks of peasant households rather than peasant farms or simply peasants. The individualistic principle was incompletely developed in the Russian peasantry. The commune dealt with the individual not as an owner of his farm, but merely as the head of the household. The commune indeed had the right to displace a household head who did not perform his duties satisfactorily.

The artel.—The communal principle was naturally applied to a certain extent to pursuits other than that of the village commune, mostly in the form of co-operatives, the arteli. After all, the great majority of the population, especially workers, were peasants or former peasants. As in the case of the land commune, the work in the artel was performed individually,

the artel taking over only certain accessory functions. For example, in the rather widespread arteli of peasants engaged in handicrafts, the artel may have sold the product or bought the raw materials, or both. A frequent form of the artel was a combination of a number of seasonal workers, such as brickmakers, bricklayers, and carpenters, or farm hands, going to a distant city or farming area. The starosta of the artel would organize transportation, make arrangements with the employers, and, if living quarters and food were not provided by the latter, look after that also. But each member of the artel received his payment individually, according to performance or other basis, and paid his share of the artel expenses. Peasants also combined to buy and rent land co-operatively. Indeed, the land purchased by peasants other than as individuals was more frequently purchased co-operatively than by the communes.

THE "RUSSIAN WAY"

The co-operative activities, in the form of the village commune and arteli, limited as they were in scope, placed Russia in a position different from that of most other European countries where the individualistic principles, specifically in land ownership and farming, had been fully developed long before. The Russian characteristics were indeed sufficiently strong to create a distinctive philosophy. For a long time the idea had found many followers in Russia that, due to the peculiarities in her economic and cultural development, Russia was not going to follow in the footsteps of the more advanced European countries but had her own specifically Russian way cut out for her. The group fostering this idea was called Slavophiles. The opposite group regarded the Russian peculiarities only as attributes of backwardness. Specifically, they insisted that the village commune was in process of decay even before Emancipation, but was again brought to life by the government, which wanted to insure through the village commune the payments imposed upon the peasants—at excessively high levels in large areas—for the lands acquired in conjunction with Emancipation. This group, called the Westerners, believed that all Rus-

sian peculiarities would disappear with economic and cultural progress.

Most interesting in connection with the subject of this study is the corresponding subdivision of the Russian socialist movement. The Social Democrats followed closely in the footsteps of the Westerners. Members of the party, indeed of both wings after the split into Bolsheviki and Mensheviki, were fiery adherents of the Marxian doctrine. Both factions continued to accept the Marxian idea that large-scale production would replace small-scale production not only in industry but also in agriculture, although the experience of the whole world testified to the contrary. They believed also that in spite of the village communes and arteli the peasant was an owner and individualist with an owner's psychology and therefore no timber for a socialist reconstruction of society. In the process of industrialization on the Western pattern he would be deprived of his property and, with it, of his psychology, and be converted into a proletarian, the only real bearer of the socialist idea. "To be boiled clean in the capitalist kettle"—in other words, for the peasants to be deprived of their property and become wage-receivers, in body and soul—was a favorite formula among the Social Democrats for a long time.

On the other hand, the Socialist-Revolutionaries and their predecessors in the late 'seventies and 'eighties, the "Land and Freedom" and "Black Repartitioning" parties, thought that Russia had her own way to socialism. The Russian peasant in their opinion was not an individualist, as was clearly revealed in the village-commune and artel state of mind. Therefore, in their opinion, no need existed for the long delay until the enormous mass of peasantry had gone through the capitalist mill and as proletarians had acquired the taste for the socialist organization of production.

There was truth in the views of both Social Democrats and Socialist-Revolutionaries. There is no doubt, for example, that the peasants' idea of equality, namely that the land is God's and only those are entitled to hold it who work it with their own hands, was gradually giving way before the requirements of economic development. But it was sufficiently alive to play a

considerable role in the revolutionary movement of 1904–05. It fostered the movement and the movement furthered the idea. At the height of the uprising the idea displayed possibly more life than ever before. The demand for "black repartition" of the land, meaning the putting of all the land of the country into one basket and then subdividing it anew on equitable terms, was in the air. Among the peasantry, it is true, "black repartition" within the narrow limits of the volost may have been more popular. Thus, the village commune, which was maintained by the Czarist government as one of its principal mainstays, turned out to be a revolutionary implement.

THE STOLYPIN REFORM

When the revolutionary movement of 1904–05 was suppressed, the government decided to eliminate the village commune and, moreover, to eliminate it in such a way as to create a broad mass of strong peasants who would be true supporters of the Czar. This was frankly acknowledged by Stolypin, the prime minister primarily responsible for the ensuing reforms. Stolypin said:

> The government has placed its wager, not on the needy and the drunken, but on the sturdy and the strong—on the sturdy individual proprietor who is called upon to play a part in the reconstruction of our Czardom on strong monarchical foundations.[8]

The principal Stolypin act was the regulation of November 9, 1906, which greatly facilitated the withdrawal of individual members from the village commune. The members, moreover, could request that their share of allotment land be given in one lot (otrub). The communes which had not partitioned in the past were prohibited from doing so in the future. The control of peasant passports by the peasants' organizations was abolished.

The village commune, which was in a state of decay even before the revolutionary movement of 1904–05 and merely experienced a brief revival in that short period, was severely hit by the new legislation, especially since the succeeding period was one of prosperity and economic progress of proportions that Russia had never experienced before. About half of the

[8] Robinson, *op. cit.*, p. 194.

peasant households in European Russia petitioned for separation. Some two million households actually received land in accordance with the regulation of November 9, 1906, and conversion of allotment land into private land proceeded in other ways as well. Much less than half of all peasant households remained in fully unchanged repartitionable tenure when the Revolution of 1917 blew all the efforts of the Stolypins to pieces.[9]

In the period between the unsuccessful Revolution of 1905 and the successful Revolution of 1917, substantial progress was also made in the elimination of strip farming. By 1916 the land of 1.2 million households (10.7 percent of all peasant households), with an average of 9.2 desyatiny per household and 9.5 percent of all allotment land, had been consolidated in European Russia.[10] In a substantial proportion of cases the consolidation of the land (otrub) was accompanied by the transfer of the homes from the villages to the frequently distant land of the owners in the form of isolated homes right on the land, in which case the otrub became a khutor.

The Northwest, the deep South, and the Southeast showed the greatest amount of consolidation.[11] It was particularly fruitful in the Northwest and the North, where many-strip farming prevailed and the three-field system was especially obsolete and easily replaceable with particularly good results by rotations without fallow and including grass. The number of consolidations showed striking differences even within the same gubernii. In districts with large proportions of labor-intensive crops (e.g., flax) and strongly developed animal husbandry, they were several times as large as in those concentrating on grain production. In the South and Southeast, where the villages were typically large, the principal advantage of the consolidation of the land holdings lay in the at least partial elimination of the long drives from villages to fields.[12]

[9] Robinson, *op. cit.*, pp. 226–27.

[10] George Pavlovsky, *Agricultural Russia on the Eve of the Revolution* (London, 1930), p. 135.

[11] *Ibid.*, p. 334 (map).

[12] In the South and Southeast 38.7 percent of all households and strips at a distance of 3.3 to 6.5 miles, while 37.1 percent had strips over 6.5 miles distant. See P. Pershin, *loc. cit.*

PRE-REVOLUTION DRIFT IN LAND TENURE

Official data for 42 gubernii which include almost all of European Russia except North Caucasus in the post–World War I boundaries show 119.4 million desyatiny of allotment land and 89.5 million desyatiny of so-called private land in 1905.[13] The state and crown lands of European Russia exceeded the allotment land, but they consisted mostly of forest and uncultivable land, and included only moderate proportions fit for use as arable land.

The nobility owned 50 million desyatiny in the area specified in Table 7 in 1905. This land was only a remnant of what

TABLE 7.—PRIVATE LAND, CLASSIFIED BY TYPE OF OWNER, 1905–1911*
(Thousand desyatiny)

Owner group	1905		January 1911	
Total private land	....	*97,681*	....	....
Peasants, Cossacks, colonists				
Individual ownership	13,209		15,079	
Co-operatively or communally owned	11,610	24,819	15,356	30,435
Nobility, officials, military officers	....	49,768	....	43,205
Clergy[a]	....	335	....	319
Townsmen[b]				
Of higher standing	16,904		17,950	
Of lower standing	3,793	20,697	3,787	21,737
Various owners	....	2,062	....	1,984

* In 47 gubernii of European Russia, excluding North Caucasus, 1922 boundaries. See *Russian Agriculture in the XXth Century*, pp. 64–65. Certain territories included in the tabulation were lost after 1917. One desyatina equals 1.09 hectares or 2.69 acres.

[a] Churches and monasteries were the principal owners in this group.

[b] This group included various ranks of people, most of whom lived in cities, though some resided in the country.

the nobles had at the time of Emancipation. Unable to hold their own against the competition of the peasants and townsmen, especially the larger peasants, they were losing it by sale. The land owned by them in 47 gubernii of European Russia was reduced from 87.2 million desyatiny in 1862 to 43.2 million in

[13] *Russian Agriculture in the XXth Century*, edited by N. P. Oganovskii and N. D. Kondratiev (Moscow, 1923), pp. 66–73. The same provinces are included that make up the total in Table 7, except Orenburg, Bessarabia, Grodno, Kovno, and Vilna.

1911—a loss of about one-half.[14] A considerable part of the land still in the hands of the nobility before the Revolution consisted of forests. A substantial part of their arable land was either leased to peasants,[15] or was cultivated by peasants with their workstock and machinery, on shares or for other form of payment.

It must be noted, however, that sales of the estate land, as well as the renting or having it operated by peasants with their livestock and implements, was the result not only of the inefficiency of the owners but also of the veritable land-hunger of the peasants in most of Russia. The peasants were willing to pay prices and rents far exceeding those justified by the prospective return from the land.

In addition to the allotment land, the peasants (including the Cossacks) in 47 gubernii of European Russia owned almost 25 million desyatiny of private land in 1905. This land had increased from 5.7 million desyatiny in 1862 to 30.4 million in 1911.[16] The peasants acquired most of the land lost by the nobility. Almost half of the private land belonging to the peasants was not owned by them individually, but was the property of village communes or, more frequently, of special co-operatives (arteli). The land was subdivided for operation among the members of the village communes and co-operatives, respectively, mostly in small lots. Of the private land owned by the peasants individually, however, about two-thirds was in such large parcels as to remove their owners economically from the typical peasantry (Table 8).

The Cossacks' land amounted to about five million desyatiny in the 47 gubernii covered by the data in Table 7. This land was classed as private but was administered in accordance with special regulations. The rank-and-file Cossacks must nevertheless be considered peasants, though in general they were richer than ordinary peasants.

In addition to their allotment and privately owned land, the

[14] *Russian Agriculture in the XXth Century*, pp. 60–61.

[15] Estimates place the leased land at one-third to one-half depending on the area. See V. P. Timoshenko, *Agricultural Russia and the Wheat Problem* (Stanford University, Calif., 1932), pp. 55–56.

[16] *Russian Agriculture in the XXth Century*, pp. 60–61.

peasants rented considerable amounts from other private owners and from the state, crown, and monasteries. Competent sources estimate the arable land and meadows rented by them at around 20 percent of the allotment land. Rented pastures and forests added approximately 7 percent.[17]

Through purchases and leases the agricultural land held by the peasants reached such proportions by 1917 that it exceeded by about four times the land held by other owners. As Oganovskii remarks, "the Revolution has only brought to completion a development which before proceeded slowly as an evolutionary process."[18]

TABLE 8.—PRIVATE LAND BY TYPE OF OWNER AND SIZE OF HOLDING, 1905*

Size of holdings (*desyatiny*)	All Owners		Peasants	
	Number (*thousands*)	Area (*million desyatiny*)	Number (*thousands*)	Area (*million desyatiny*)
Under 50	599.3	6.43	427.7	3.98
50– 100	53.8	3.90	20.2	1.51
100– 500	74.6	16.78	17.1	3.43
500–1,000	15.0	10.53	1.7	1.20
Over 1,000	13.6	51.89	1.0	2.23
Peasant co-operatives and village communes	...	...	67.0	10.13
Total	756.4	89.52	534.8	22.49

* In 42 gubernii of European Russia. See *Russian Agriculture in the XXth Century*, pp. 66–73.

The share of the peasantry in agricultural production appears ultimately to have become even larger than is indicated by the data on land tenure. The census of 1916 showed 89.1 percent of the cropped plowland in the hands of the peasantry (not necessarily only peasantry of the working type). The census data, it is true, reflected the specifically wartime conditions when the large owners, suffering from labor shortage, had to cut their acreage radically. Still, the moderate role of the nobility in agricultural production at the end of the Czarist regime is

[17] N. P. Oganovskii, *Essays on Economic Geography of Russia, I* (Moscow, 1922), pp. 78–79.

[18] *Ibid.*

beyond doubt. Kondratiev estimated the proportion of the cropped arable land of the peasants in those years at 85 to 90 percent;[19] he probably did not exclude peasantry of the non-working type. A widely quoted computation by Professor Nemchinov gave the prewar grain production of the landlords at 600 million poods, or 12 percent of the total.[20]

The share of the nobility and large estates generally was even less in all other crops except sugar beets. Flax, hemp, and vegetables were peasants' crops almost exclusively. Only in sugar beets did the large estates hold a virtual monopoly. The share of the nobility in productive livestock was again small, not exceeding 5 to 6 percent of the total in 1916 (census).

STRATIFICATION IN AGRICULTURE

A very large estate with a more or less palatial residence and an adjacent peasant village with a host of peasants' huts was a typical sight in serfdom Russia. Except that the number of large estates had greatly declined, little change occurred in that picture until the 1917 Revolution. The intermediate layer of medium-sized farms was always very small in Russia.

In 1905 over half of the private land was in fewer than 14,000 huge estates (over 1,000 desyatiny, in Table 8), averaging almost 4,000 desaytiny each. Little more than 10 percent of the private land belonged to those having no more than 100 desyatiny. While a large proportion of the land of the big estates was rented out, it was mostly rented to the neighboring peasants, "the estate's peasants." The picture of the big manorial estate with its peasantry persisted.

In contrast to the typical estate of the nobility, the typical peasant household was a tiny affair. It handled 15–20 acres of land other than pasture, lightly cultivated with one or, rarely, two small horses or a pair of oxen and very little machinery. Its productive livestock consisted of a cow, a pig (not in all areas), a couple of sheep, and a few chickens. In areas with more livestock per household there may have been less arable

[19] N. D. Kondratiev, *The Grain Market and Its Regulation During War and Revolution* (Moscow, 1922), p. 10.

[20] See Joseph Stalin, *Problems of Leninism* (9th ed.), p. 317. Stalin, however, does not mention the source.

land. The peasant's hut rarely had more than one room; in many areas they were built of mud and the roofs were commonly of straw.

The average amount of allotment land per household in 42 gubernii was 10.7 desyatiny in 1905.[21] This figure includes all allotment land, that distributed among the households and that remaining in possession of the village commune. Moreover, the average was boosted by relatively large holdings in areas where land was of particularly low productivity or relatively plentiful for other reasons. For example, the average was 15.5 desyatiny in Vologda, 16 desyatiny in Vyatka (now Kirov) and Perm (now Molotov), 22.4 desyatiny in Samara (now Kuibyshev) and Astrakhan, and even 65 desyatiny in Olonets in the far North. On the other hand, in the Southwestern region,[22] with its relatively good land, the average was only 5.5 desyatiny, in the Little-Russian region[23] 6.1, in Central-Chernozem region[24] 7.5 desyatiny, and so on. The situation was somewhat more favorable in North Caucasus and Siberia, but a large part of Siberia had low yields and all of it had poor outlets for its produce.

The census of 1905 showed the following distribution of peasant households in 42 gubernii of European Russia by size of allotments held:[25]

Size of allotment	Number of households (*thousands*)	Percent of all households
Less than 5 desyatiny	2,669	23.8
5 to 10 desyatiny	4,940	44.1
Over 10 desyatiny	3,591	32.1
Total	11,200	100.0

Thus only 3.6 million households held over 10 desyatiny of allotment land. The larger holdings naturally tended to be concentrated in the less crowded areas.

The small size of the typical peasant enterprise is clearly

[21] *Russian Agriculture in the XXth Century*, pp. 69 and 73.

[22] Kiev, Volyn, and Podoliya.

[23] Kharkov, Poltava, and Chernigov.

[24] Kursk, Orel, Tula, Ryazan, Tambov, and Voronezh.

[25] *Russian Agriculture in the XXth Century*, p. 73.

demonstrated also by the data on horse ownership. In 44 gubernii the situation was as follows in 1912:[26]

Horses per household	Percent of all households	Percent of all horses
None	36.5	....
1 to 2	40.4	42.6
2 to 3	21.2	47.9
4 and more	1.9	9.5

At least one horse, or its equivalent in oxen, was indispensable for farming even under the primitive Russian conditions; in areas with heavier soil two horses were the minimum. Some of the horseless households had their income from non-agricultural pursuits. The majority, however, sold their labor to landlords or well-to-do peasants, so far as such work was available. Many were real paupers. On the other hand, three horses, frequently small horses, by no means point to large-scale production and affluence. Only 1.9 percent of all households had four or more horses. The households with more than two horses were mainly confined to less populated outlying areas.[27]

The true extent of stratification within the peasantry shown by the all-Russian data was exaggerated not only by regional factors. Also important was the strongly pronounced tendency of the households with larger acreages to consist of a large number of persons. The phenomenon was especially prominent in village communes that actually repartitioned their land from time to time, but it was by no means confined to these. Households consisting of the old folk, two married sons with wives and children, and a couple of unmarried daughters—12 to 15 people in all—were by no means rare, while households with 8 to 10 persons were common.

Following are data for allotment land in Ufa guberniya located in European Russia close to the Urals, for 1913–14[28]

[26] *The Bases of a Tentative Plan of Development of Agriculture and Forestry*, Commissariat of Agriculture RSFSR (Moscow, 1924), p. 13. Probably workhorses.

[27] Instead of using the abundant data on the stratification of peasant farming released by statistical offices and scholars, Alexander Baykov in *The Development of the Soviet Economic System* (New York, 1946), p. 13, reproduces Lenin's comic figures according to which there were, in 1905, 10.5 million poorest and one million average peasant households, 1.5 million rich peasant households and medium estates, and 30,000 big estates.

[28] *Economic and Statistical Survey of Ufa Guberniya in 1913* (Ufa, 1915), pp. 122–23.

(the contrasts in family size may appear less marked than in many other areas):

Households	Average cropped plowland in desyatiny	Average number of persons
Without cropped plowland	....	4.23
Up to 2 desyatiny	1.26	4.50
2.01 to 4 desyatiny	2.98	5.17
4.01 to 10 desyatiny	6.34	6.15
Over 10 desyatiny	18.02	7.59

There is no doubt that in the half-century following Emancipation a strata of richer families emerged from the almost uniform "gray" mass of the former serfs (some differentiation had existed even among the serfs). Some of them outgrew the peasant status, although legally they may have continued to belong to it. As is shown by the data in Table 8 (p. 145), more than 400,000 peasants owned land in lots of less than 50 desyatiny, and there were those who had a share in private land owned by the village communes and peasants' co-operatives. The lots with less than 50 desyatiny averaged less than 10 desyatiny. The land purchased by the peasants co-operatively was mostly distributed in small lots among the individual households, and certainly this was the case with the land purchased by the village communes. However, by the low Russian standards, a peasant household which had 10 desyatiny of purchased land in addition to the same amount of allotment land (some 55 acres in all) was a well-to-do household, far above the common level, even if it consisted of 8 to 10 persons.

The Russian countryside was indeed characterized not so much by the riches of a relatively few as by the great poverty of the mass. Otherwise the Revolution of 1917 would have taken quite another course. In substance this was the conclusion of the authors of the first plan for the development of agriculture under the Soviet regime. It stated: "On the basis of those data the countryside emerges in a state of vast predominance of pauperized and semi-pauperized groups of peasants."[29]

A strong proof that great poverty of the mass was the outstanding characteristic of Russia's peasantry was the degree

[29] *The Bases of a Tentative Plan . . . . .*, p. 13.

of intensity of production as measured in output per acre. In other countries the small farmer normally has a larger number of productive livestock per hectare, grows relatively more crops requiring large inputs of labor per acre, and correspondingly produces a greater outturn per acre than the large farmer. This was not the case with the Russian peasant. The authoritative source just quoted summarized that part of its analysis in these words: "The higher [peasant] groups . . . . have a quantitatively greater gross return per hectare of land suitable for agriculture."[30]

It is generally recognized that the higher groups of the peasants were the more advanced technically. On this, the same source stated, "The economically stronger groups [of peasants] have a greater possibility of saving, and therefore of agrotechnical advancement." In support, it quoted data from Pskov guberniya showing that the households using commercial fertilizer were eight times as numerous among the households with more than 25 desyatiny as among households with less than 5 desyatiny. Correspondingly, in the first group clover was grown ten times as frequently as in the second group.[31] From these data it is obvious that the general conclusion of the Commissariat of Agriculture that, "The peasant rural economy is more intensive [than the economy of large estates] and fully open to technical and economic advancement"[32] pertained primarily to the higher groups of the peasantry.

The land shown in Table 7 (p. 143) as belonging to townsmen, some of whom were formerly peasants, was also managed better than the land of the rank-and-file peasants. Many of the sugar-beet estates, owned by people of various ranks, were conducted with great efficiency and in accordance with the latest achievements of agricultural science.

So far as the nobility cultivated their land themselves, their cultural practices, and especially their machinery, were on a much higher level than those on the average peasant farm. Indeed, contemporary Russian statistics usually provided a double

[30] *The Bases of a Tentative Plan . . . . .*, p. 15.

[31] *Ibid.*, p. 14. Date not stated, but the discussion pertains to pre-World War I.

[32] *Ibid.*, p. 11.

row of figures on yields per desyatina, those obtained by the peasants and by the private owners, which included the nobility. The average yield of all grains in 50 gubernii in 1901–10 was recorded at 43 poods per desyatina (9.7 sixty-pound bushels per acre) from peasant land and at 54 poods per desyatina (12.3 sixty-pound bushels per acre) from privately owned land.[33] The comparison is slightly less unfavorable to the peasants if the data for individual grains are taken.[34]

POST-REVOLUTION LAND TENURE[35]

The agricultural policies of the Soviet Union in the early years after the Revolution were an amalgam of the philosophy of the Bolsheviki, peasants' ideas and sentiments, and economic and political necessity, the peasants' ideas and sentiments being of course a "necessity" from the Bolshevik point of view.

Dislike for the landed gentry was the only thing common to the Bolsheviki and the peasantry; otherwise their respective philosophies were opposed. The undoubtedly considerable gains that the individualistic principles made in peasant farming in the decade 1905–15 were largely lost in the revolutionary upswing of 1917. The more prosperous individualists among the peasants were pushed aside; others took their place as the mouthpieces of the peasantry. The idea that the land is God's and should be used only by those who want to work it with their own hands blossomed again and indeed gained more power than it ever had before. Equal rights for everybody obviously implied only small individual allotments which, however, as before, were to be used individually.

Those ideas did not fit at all into the Bolshevik philosophy. The partitioning of the large estates was even considered by them a reactionary measure. For a long time the Bolsheviki, and the Social Democratic Party in general, refused any concessions on this point, although this could not fail to antagonize the peasants. After much hesitation the Bolsheviki, in 1903, included

[33] N. D. Kondratiev, *The Grain Market and Its Regulation* ...., p. 6.

[34] *Recueil des Données Statistiques et Economiques sur l'Industrie Agricole en Russie et dans les Pays Étrangers* (St. Petersburg, 1913), VI, 78–81.

[35] For a more detailed discussion of the problems dealt with in this section, see Lazar Volin, "Agrarian Individualism in the Soviet Union: Its Rise and Decline," *Agricultural History*, January and April 1938, XII, 11–31 and 118–41.

in their program the demand that the land used by the peasants before 1861, but cut off and added to the landowner's land in conjunction with Emancipation, be returned to the peasants.[36] This idea, known by the term "cuttings," was stillborn. Under peaceful conditions even this proposal went too far. Under revolutionary conditions it did not go far enough. Moreover, too many changes in land ownership had occurred since Emancipation to base the land reform on the status of that time.

The great role that peasant uprisings played in the unsuccessful but nevertheless profoundly important Revolution of 1905 persuaded the Bolsheviki to go with the peasants to the end by accepting the slogan "all land to the people," but they did not do it definitely before 1912[37] and not wholeheartedly even then. The outcome was that, in the final struggle with the Czarist regime, the peasants almost to a man supported the Socialist-Revolutionaries, a non-Marxist party. The influence of this party with the peasants was indeed so great that, after the Bolsheviki got the upper hand in the cities in November 1917, they felt it advisable to enter into a coalition with the left faction of the Socialist-Revolutionaries (the principal body of this party belonged to the Kerenski coalition) and leave to it the handling of the agrarian problems. A Socialist-Revolutionary became People's Commissar of Agriculture.

A few hours after the Bolsheviki seized power on November 8, 1917, they issued the Land Decree. This met the basic wish of the peasants of getting the landlords' land, and thus also achieved the aim of the Bolsheviki to insure for themselves the good will of the peasants.

The peasant line.—The Land Decree consisted of five articles. Article 4 prescribed that the "Peasant Instruction on Land," an instruction based on 242 peasants' instructions, prepared by the editors of *Izvestiya of the All-Union Council of Peasants' Delegates* and published in the issue of August 19, 1917, was to serve as a guide. The "Instruction" was definitely a Socialist-Revolutionary product, and so were practically all the requests on which it was based.

[36] I. D. Laptev, *Soviet Peasantry* (Moscow, 1939), p. 17.

[37] *Ibid.*, p. 28.

The nebulous idea of socialization of the land, the basic principle of the Socialist-Revolutionaries, was formulated in the "Instruction" as follows:

> The right of private property on land is to be abolished for all time. The land shall not be bought, sold, leased or otherwise alienated. All lands, whether belonging to the state, the former imperial family, the ex-Czar, the monasteries, or the church, whether copyhold, entailed, private, communal or peasant, shall be taken without compensation, turned into the property of the entire people, and placed at the disposal of all who till them for use.[38]

The wording leaves no doubt that "socialization of the land" was thought of as a thing entirely different from the state property. State land, like all other land, was to be expropriated to become property of the people. Later, all land was regarded as forming state (republican) funds, administered by the individual federated republics and governments. Not before 1922 was socialization of the land interpreted as equal simply to state property. In 1928 all land was declared the property of the USSR rather than of the individual federated republics.[39]

Contrary to the basic request of the "Instruction," the Land Decree itself prescribed the confiscation without compensation only of landlords' land (Article 1) and crown and church land (Article 2). Article 5 explicitly exempted from confiscation the land of rank-and-file (ryadovoi) peasants and Cossacks. While the concept ryadovoi Cossack was definite (corresponding to a private in the army), the expression ryadovoi peasant had no definite meaning.

According to the "Instruction" to be used as a guide, the land was to be distributed to those wanting it on the basis of their labor supply or of the number of eaters, depending on the local conditions. An instruction dated March 11, 1919 spoke only of distribution according to the number of eaters.[40]

The Socialist-Revolutionaries' ideas on the ideal land tenure implied prohibition of the use of hired labor and of the leasing of land, however impractical such prohibition might be in view

[38] Quoted from W. Ladejinsky, "Collectivization of Agriculture in the Soviet Union," *Political Science Quarterly*, March 1934, XLIX, 7.

[39] Dr. V. V. Gzovsky of the Library of Congress was consulted on this point.

[40] The following equivalents were prescribed for this distribution: adult man, one unit; adult woman, .8; adolescent boy, .75; adolescent girl, .6; child, .5 (see B. Knipovich, "Direction and Results of Agrarian Policies, 1917–20," *On Land*. 1st issue, Moscow, 1921, p. 25).

of the varying amount of labor available in each household and the seasonal nature of agriculture. Both requests, however, were duly incorporated in the "Instruction" and thus became law.

In actual practice all land of private owners, as well as four-fifths of the land privately owned by the peasants and one-half of the peasant land detached from the communal land into separate units in accordance with the Stolypin laws (khutory and otruba), were confiscated.[41] In 32 gubernii of European Russia, 22.8 million desyatiny were made available in this way according to data for 1919.[42]

There was a pronounced regional aspect in the confiscation of the khutory and otruba in that it occurred mainly in the steppe areas where this form of land tenure had not had time to take root, and where the adverse effects of strip farming and the three-field system were relatively slight. In the West, North, and partly in the Center the khutory and otruba were largely preserved, not without support of the government.[43]

The confiscated land was disposed of according to local wishes. According to data for 32 gubernii in 1919, 4.6 percent was retained for state operation, mainly as state farms; 1.7 percent was turned over to kolkhozy, and 93.7 percent was subdivided.[44] The peasants owned about 95 million desyatiny in those 32 gubernii before the Revolution. Thus the roughly 20 million desyatiny which became available for them added slightly more than 20 percent. But not all additional land reached those peasants who worked the land before the Revolution. The countryside was swelled by persons returning from cities, where the practical standstill of industry deprived a large proportion of the population of means of livelihood.

The dream of black repartitioning was not carried out. Knipovich describes the process as follows:[45]

> The socialization [of the land] was not realized on an all-Russian scale; the conversion of all Russia into one repartitioning commune with a complicated system of equalizing the land [tenure] in all Russia, visualized by the Socialist Revolutionaries, could not be fulfilled. In practice the land was

[41] See Y. Blyakher, "The Present Land Tenure According to a Special Survey of the Central Statistical Board," *Statistical Courier*, 1923, Nos. 1–4, p. 151.

[42] *On Land* (1st issue, Moscow, 1921), pp. 8–9. [43] Pershin, *op. cit.*, pp. 70–71.

[44] *On Land* (1st issue, Moscow, 1921), p. 9.

[45] B. Knipovich, "Direction and Results of Agrarian Policies 1917–20," *ibid.*, pp. 24–25.

absorbed by the local population. Migration from areas with little land to areas with much land occurred only in isolated cases. The equalization was perfect within villages; inter-volost [volost was the smallest administrative unit] equalization was more rare; inter-uezd [each guberniya was subdivided in several uezdy] equalization was even rarer. There was none among the gubernii.

The amount of additional land was, in general, largest in areas of relative land abundance. Typically, one-fourth to one-half desyatina per person was obtained, but in a few areas the addition was less than one-tenth of a desyatina per person.

Most affected by the Revolution, naturally, were the extreme groups of the villages (Table 9). This is clearly reflected even

TABLE 9.—EFFECT OF THE SOCIALIZATION OF THE LAND ON PEASANT FARMING*

Region	Average cropped plowland per household, 1917 (*desyatiny*)	Percentage decline, 1917 to 1919		
		Households without cropped plowland	Households with more than 13 desyatiny of cropped plowland	Households with 4 or more workhorses
Lower Volga	6.4	16.3	68.6	60.3
Ural	4.5	19.8	63.3	51.6
Middle Volga	4.2	59.5	91.4	92.6
Central Agricultural	3.9	60.7	91.8	83.5
Northwestern	3.4	40.8	90.8	63.5
Central Industrial	2.0	42.2	95.5	83.4
Lake	1.9	19.2	100.0	82.0
Northern	1.8	44.1	....	83.3
Average	3.9	38.0	77.1	64.1

* From *Economic Differentiation of the Peasantry in 1917 and 1919*, Studies of the Central Statistical Board, VI (3d issue, Moscow, 1922), p. 10.

in statistics for the country as a whole.[46] The following data, covering 26 gubernii of European Russia, reveal the changes that took place between 1917 and 1919 in the distribution of households according to their cropped plowland (percent of all households):[47]

Category of household	1917	1919
Without cropped plowland	11.4	6.5
Less than 4 desyatiny	59.1	77.0
4 to 7 desyatiny	21.6	16.4
7 to 13 desyatiny	4.5	2.2
Over 13 desyatiny	3.4	0.9

[46] See also *ibid.*, pp. 26–27.

[47] *The Bases of a Tentative Plan* . . . . . p. 19.

Thus only 3.1 percent of all households had more than seven desyatiny (19 acres) in crops other than hay after the agrarian revolution of 1917. This might have been expected. But the group having as little as four to seven desyatiny (about 10.5 to 19 acres) also declined considerably. Indeed, three out of four households had less than four desyatiny of cropped plowland in 1919.

The decline in the proportion of households without crop acreage was the least among the reasons for the great contraction of the cropped plowland in larger peasant holdings. The general reduction in sowings due to the Civil War was one factor, but the principal reason for the contraction was the large increase in the total number of peasant households. Some of the new households consisted of those who had ceased to work the land but now came forward with a claim for it. However, splitting of large peasant households was the most important source of the increased total number of households.

It became unpopular, unprofitable, and even dangerous to be well-to-do, especially to be a well-to-do peasant. It was much safer to have two horses in each of two households consisting of five persons each than to have four horses in a household consisting of ten persons. Indeed, in many areas two horses were reasonably safe only if each was in a different stable belonging to a different household. Mass splitting of the larger households, which normally were large also in family numbers, proceeded at a rapid rate in those years. While the number of households in existence on January 1, 1918, within the 1922 boundaries, was estimated at 16.5 million, the figure rose to over 24 million by 1920, an increase of about 50 percent.[48] Some households may have split as early as 1917, thus swelling the figure used as a starting point in the above comparison.

Along with their land, the large landowners also lost in the Revolution their livestock, machinery, and other assets. Not quite the same situation, but still a very serious one, resulted from the splitting of the larger peasant households. Shortage of capital was always the principal weakness of Russian peasant farming. Even the well-to-do peasants had little. Splitting frequently

[48] *Kolkhozy in the 2d Stalin Five-Year Period*, Gosplan (Moscow, 1939), p. 1.

made two definitely weak households out of one of reasonable efficiency.

Whatever the appraisal of the agrarian revolution, it eliminated or greatly reduced all or most of the farms that, according to official computations, had produced about half of the grain crops, had accounted for approximately as large a proportion of the agricultural production, and had an even greater share in marketings.

When agriculture started on the road to recovery in 1922, the process of differentiation of the peasantry was resumed, all handicaps notwithstanding. However, aside from these handicaps, the span of time remaining before the big collectivization drive began was too short to permit substantial change (see chapter viii on the status immediately before the drive).[49]

The Party line.—While the Land Decree sanctioned everything the peasants wished, the ruling Party regarded the situation created by the Decree as temporary only. Since it considered large-scale agricultural production greatly superior to small-scale production, it believed inevitable the rise of large-scale bourgeois elements out of the equalization resulting from the Revolution. Even the small peasants were distrusted. Common or state ownership of the land was more or less a fiction; the peasants were the real owners. Their strong sense of ownership, however small their individual holdings, was believed much more likely to unite them with the larger owners in the villages and cities than with the propertyless proletariat.

The Decree of February 19, 1918, "On Socialization of Land," was primarily intended to insure the equitable subdivision of the land in agreement with the Land Decree of November 8, 1917. But it also ordered the government "to promulgate the development of collective economy in agriculture, which is more economical with reference to labor and production, at the expense of individual farming, with a view of transition to socialistic agriculture."

The situation, however, was very unfavorable for large-scale

[49] An extensive discussion of the differentiation processes in the peasantry under the Soviet Power took place in 1927, with practically every prominent economist participating; see *The Ways of Agriculture*, April through September 1927. See also M. Sulkovsky, "*Class*" *Groups and Production Types of Farming of Peasant Economy* (Moscow, 1930).

undertakings along these lines—both during the Civil War which almost paralyzed the whole economic structure, and in the ensuing period of recovery. During the Civil War the Soviet Power, fighting for its very existence, was forced to antagonize the peasants even without attempts at socialization of agricultural production. The food shortage was critical and industrial consumer goods were well-nigh absent. The peasants had to deliver every bushel of grain beyond the very limited amounts allowed for food for their families, seed, and perhaps some feed, simply for paper money which could buy nothing and sometimes was actually used as wall covering. The less food was available, and the more unprofitable the boundless inflation and the shortage of consumer goods made sales and production for sale, the more ruthless became the requisitions. At an early stage resort was had to specially organized committees of the village poor, the so-called kombedy, whose principal job was to extort grain from co-villagers—for a share in the proceeds. It is easy to imagine how the kombedy were hated by those peasants whose thrift had secured for them a little more than the permitted minimum.

Obligatory deliveries of all surpluses were part of the policies later referred to as "War Communism," dominated by the slogan "from everyone according to his ability, to everyone according to his needs." The slogan not only grew out of the shortages brought about by the war and Civil War, but had an ideological basis in the assumption that all that was necessary for the highest ideals of real equality to be realized overnight was for the Communists to take the power. Under the conditions of critical all-round scarcity, the slogan was a menace to almost everybody, even to those who had little.

The government was very weak when all its enemies finally collapsed. Such limited power as it had for influencing the national economy it wanted to utilize for the restoration of industry on a socialistic basis, since the industrial proletariat had been its principal source of strength. To succeed in this, it was essential to have the good will of the peasants; and this could be best achieved by guaranteeing them non-interference in their production and the right of disposal over their surpluses (Decree

of March 21, 1921).[50] The Land Code of October 30, 1922 permitted the renting of land for a short time and with the proviso that the lessee did not use hired labor. In 1925 these restrictions were removed to such a degree that one could almost speak of encouragement of the kulaki, the important providers of food for the cities. The coalition with the left wing of the Socialist-Revolutionaries was dissolved early in 1918 (with the leaders being put in jail for safety). But Socialist-Revolutionaries of all shades, and even persons somewhat to the right of these retained great influence on the administration in matters related to agriculture, and they practically monopolized research and planning in agriculture. Some concessions to private initiative had to be made even in small-scale industry and trade. This was the well-known NEP (New Economic Policy), which was officially proclaimed in March 1921 and lasted for about seven years.

The few large farms which survived the peasants' avalanche of 1917–18 by having been declared state farms, were permitted to fall into partial decay during the Civil War and little was done to rehabilitate them in succeeding years (see pp. 236–37). With large government subsidies and other substantial privileges a limited number of organizations for collective farming (kolkhozy) were brought into existence on a voluntary basis, but they did not particularly flourish either (see chapter xiii, pp. 298–304).

Having had to abstain from interference in the production process of the individual peasantry as such, the government was anxious to find substitute ways of drawing them into the socialized economy. The Party's attitude toward the farmers' cooperatives for credit, purchase, and sale is obvious from the following quotation: "A particularly strong reflection of the growth of the kulak capitalist enterprises [before the Revolution] was the rapid development of all forms of co-operatives."[51]

[50] The taxes which replaced the obligatory deliveries of all surpluses were high, it is true. It was estimated that in 1923 the peasants had to yield by way of taxation about 10.5 percent of their gross production, compared with about 8.2 percent of prewar payments, which included also rent of leased land and interest on loans. See L. E. Hubbard, *The Economics of Soviet Agriculture* (London, 1939), p. 86.

[51] D. Lurie and Y. Nikulikhin, *The Party Policies in the Village* (Moscow and Leningrad, 1934), p. 40; a textbook for the highest Communist agricultural colleges.

But the co-operatives were believed less dangerous when functioning under vigilant supervision of the Party and its government, and were accepted as a lesser evil. With the subsidies, loans, and other privileges bestowed upon the co-operatives, for example, in obtaining scarce goods from the government or in participating in exports, the rapid spread of these co-operatives was assured (Appendix Note D).

The kontraktatsiya, or buying of farm products by the state for future delivery, was another measure by which the peasants were to be connected with the socialist economy (see Appendix Note E).

The great enthusiasm for machinery, and especially tractors, found some outlet in co-operative machine-lending and specifically tractor-lending "points," also operated largely with great help in the form of state subsidies and credits. All these points possessed only a tiny fraction of the total agricultural machinery; even so, they served individual peasants almost exclusively, and the larger individual peasants to a greater extent than was desired by those in power (see pp. 269–70).

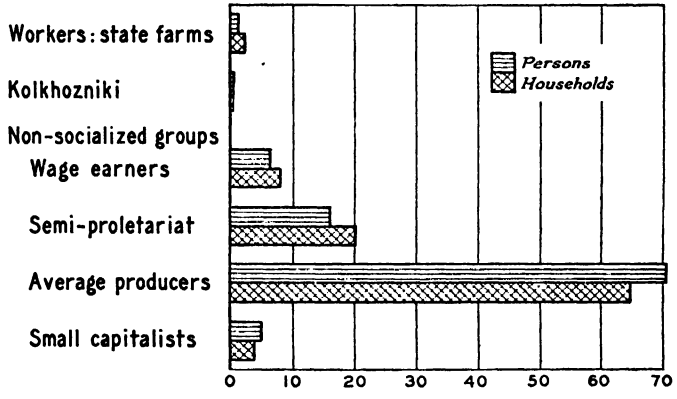
CHAPTER VIII

PRE-COLLECTIVIZATION PEASANT FARMING

Individual peasants accounted for 98.2 percent of the total agricultural output in 1927–28. The following description of the economy of this group may therefore be taken as representative of Soviet agriculture before the great collectivization drive. The negligible residual production was the share of the state farms and kolkhozy. The status of these organizations at that time is discussed on pages 235–37 and 296–98.

CHART 10.—"CLASS" COMPOSITION OF THE PEASANTRY IN 1927*

(Percent of respective totals of persons and households)



* Data in Chart Appendix.

"CLASS" COMPOSITION: AN OVER-ALL VIEW

Chart 10 shows what was called in the USSR the "class" composition of the peasantry, in 1927–28. The writer excluded those peasants who were believed not to belong to the rural economy consisting of agriculture, forestry, fishing, and hunting. The grouping of the peasant households shown in the chart is that of the Central Statistical Board. Another grouping, made by a special committee of the Soviet of People's Commissars USSR, is very similar. This subdivided the households and

population engaged in rural economy in 1926–27 as follows (in percent of the respective totals):[1]

Class	Households	Population
Proletariat	*11.2*	*4.2*
Workers	10.7	3.9
Employees	0.5	0.3
Independent	*88.8*	*95.8*
Poor	22.1	18.7
Average	62.7	71.9
Entrepreneurs	3.9	5.2

Thus some 20 percent of all households were classed as poor independent producers or semi-proletariat. "Poor producers" included (*a*) households without workstock having less than 4 desyatiny of cropped plowland, plus 50 percent of those without workstock but having 4 to 6 desyatiny of cropped plowland, and (*b*) households with one head of workstock and less than one desyatina of cropped plowland.[2] The households answering this description were unquestionably poor, as were most of those shown as workers. But the group labeled "semi-capitalistic producers" in one of the classifications and "entrepreneurs" in the other, and generally referred to as kulaki, were also small producers; their entrepreneurship was on a small scale, not only by United States standards but by the standards of many other countries. The "official" definition of this group, as it pertains to rural economy, runs as follows:[3]

> As entrepreneurs are classed all household heads, connected with rural economy, reporting rural economy as their principal source of money income who (*a*) possess means of production valued at more than 1,600 rubles and let on lease means of production or hire labor for over 50 days during the year; (*b*) possess means of production valued at more than 800 rubles and hire labor for more than 75 days during the year; or (*c*) possess means of production valued at more than 400 rubles and hire labor for more than 150 days per year.

Ownership of property worth 1,600 rubles (equivalent to about $800) in livestock, machinery, buildings other than dwelling houses, and land improvements including trees and vineyards certainly does not indicate great riches. The hiring of

[1] *Statistical Handbook USSR, 1928*, Central Statistical Board (Moscow, 1929), pp. 42–43.
[2] *Ibid.*, p. 940.
[3] *Ibid.* The definition was official for statistical usage. No legal definition of the term "kulak" was made, but the figures found in statistics were used by the government and Party.

labor for more than 50 or even more than 75 days per year in as seasonal a pursuit as agriculture is commonly essential for the efficiency of the enterprise. Much more hired labor than this would not normally deprive such an establishment of the character of a family farm. It is noteworthy that hiring help on a year-round basis for housework in cities—with their relative comforts of inside water, electricity, and frequently heating as well—did not and still does not put a family into the exploiter class in the Soviet Union. Thus peasants were made into a special, and lower, social group.

Only 3.9 percent of all households had the fortune or misfortune to fall into the category of entrepreneurs. The annihilation of so negligible a proportion of the peasantry, which, as will be shown, possessed only a moderate amount of economic power, could not possibly be made the object of a country-wide struggle. Consequently, the group against which the struggle had to be waged in the succeeding drive was extended to include the "well-to-do." These obviously were even poorer than the kulaki.

The character of the various groups of peasant households is illustrated in detail in the following pages. But even from the data in Chart 10 and in the above tabulation one can infer that, in spite of the rapid splitting up of large households during the preceding decade, the tendency of well-to-do peasant households to be large-family households was still in evidence. The small capitalistic group averaged 6.5 persons per household, while the common producers had 5.4 persons and the lowest group only 3.9. It was, of course, only natural that as the family grew, means of production were accumulated in order to feed it, to take care of the greater acreage to which the larger size of the family entitled it, and to utilize the greater man power that larger families usually had.

THE 1927 SURVEY OF PEASANT ECONOMY[4]

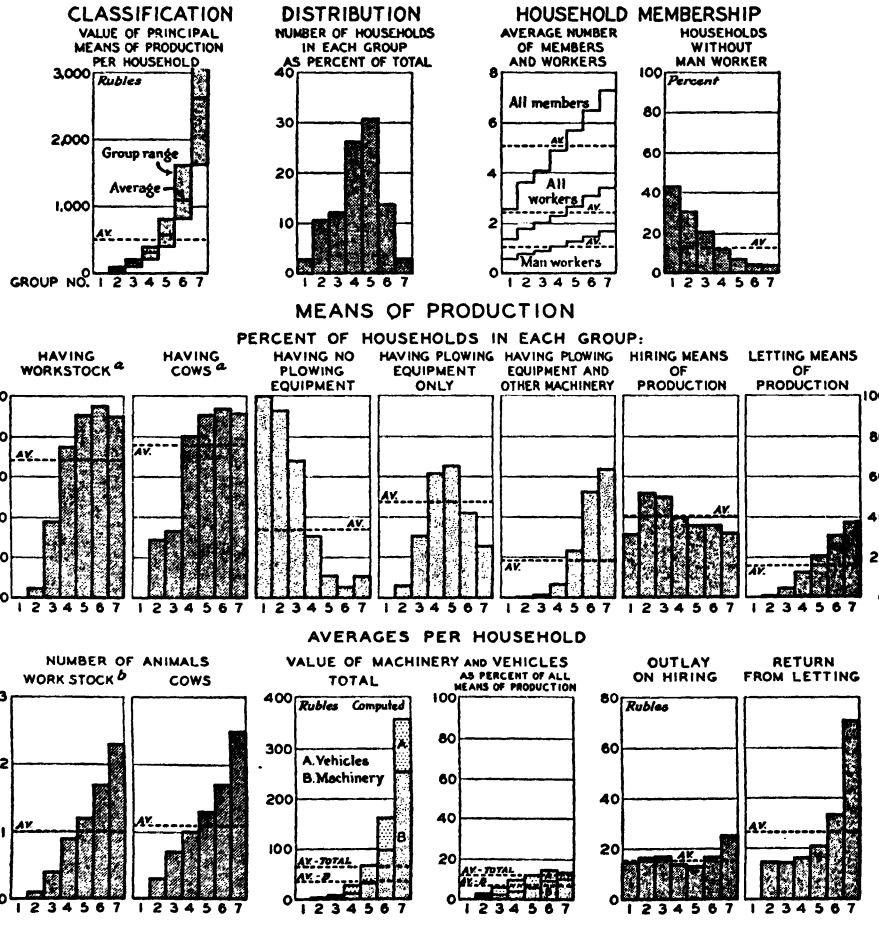
A survey of 615,400 to 654,400 peasant households in 1927 gives a vivid picture of the organization and functioning of the pre-collectivization peasantry. The households investigated were grouped according to the value of the principal means of pro-

[4] *Statistical Handbook USSR, 1928*, pp. 90–133 and 144–55.

duction, which included buildings other than dwelling houses, livestock, farm machinery other than the simplest implements like the sickle, and even the equipment of industrial enterprises. In general, seven groups of households were distinguished, as follows: Group 1, without any principal means of production; and groups 2 to 7, with ascending amounts of such means, the highest group having more than 1,600 rubles invested in the principal means of production (Chart 11).

Along with occupation in rural economy, occupations of the investigated households in industry, trade, home service, and

CHART 11.—PRE-COLLECTIVIZATION PEASANT RURAL ECONOMY: GENERAL DATA AND MEANS OF PRODUCTION*



* Data in Chart Appendix.

a Chart Appendix data here inverted. b In terms of horses.

other fields, were covered by the survey. As shown in Chart-Table 11, p. 780 (data not charted), 2.8 percent of the investigated households were not connected at all with rural economy, while outside sources predominated in the income of 5.4 percent of them. However, 24.6 percent of the households in group 1 (those without any means of production) were not engaged in rural pursuits at all, and 10.5 percent followed them only as a secondary source of income. The corresponding percentages were 10.9 and 10.7 respectively in group 2 (households having 100 rubles or less in principal means of production).

In the analyzed material the three rural non-agricultural pursuits (forestry, fishing, and hunting) are unfortunately entirely inseparable from strictly agricultural pursuits. The average means of production, the amount of draft power, acreages, and similar indicators of the size of farm business were of course depressed somewhat by the inclusion of households not engaged strictly in agriculture. In a sense the same is true of the households included that obtained their living from work on state farms, or had permanent employment as farm help on larger peasant farms.

FAMILY SIZE

Chart 11 clearly demonstrates the considerable dependence of the amount of investment and the magnitude of the whole enterprise on the size of the family, and particularly on the number of workers in the individual household. Group 6, for example, averaged 6.5 persons, of whom 3.1 were workers, including 1.5 male workers; the average household of group 2, on the other hand, was composed of only 3.6 persons, of whom 1.8 were workers. In every group the magnitude of the enterprise showed a direct relationship to the size of the family and the number of workers.

The households without man workers (Chart 11) comprised no less than 13.6 percent of all households investigated. It is obvious that peasant farming, forestry work, fishing, and hunting are all pursuits that cannot be conducted properly without a man worker. Households without a man worker rarely become established as independent economic units, while the enterprises of households that have lost their male workers usually deteri-

orate and are then frequently liquidated, the women taking work elsewhere, often as home servants in cities. It is therefore only natural that the households without a man worker fall mostly into the lowest groups of the households surveyed. Almost one-half of the households in group 1 and almost one-third of the households in group 2 were without a man worker. In each of the two highest groups, by contrast, fewer than 5 percent of the households were without a man worker. Some of the households without a man worker, it is true, may have been brought to life by the desire to split the investment of one bigger household between two small ones, without actually splitting the households and their operations.

The direct relation between the size of the household and the size of business makes it obvious that whatever riches were present were by no means always inherited. A newly married couple began in a small way, and by hard work and efficiency gradually worked its way up the ladder. This phenomenon is typical of family farming in every country. The loss of the man worker spells ruin.

MEANS OF PRODUCTION

Total.—The total investment in rural economy (excluding land) in 1927–28 was estimated at 28,741 million 1925–26 rubles.[5] The population involved was approximately 110 million. This implies a per capita investment of little more than 250 rubles, or about $125. (While such conversions to dollars cannot safely be trusted, these figures give an idea of the very low production and living levels of the Russian peasantry before collectivization.) The investment was composed as follows (in million rubles):

Machines and implements	1,208
Tractors	52
Means of transportation and small implements	2,020
Dwelling houses	10,833
Buildings for productive purposes	5,734
Livestock, including bees	8,001
Melioration and irrigation	893
Grand total	28,741

[5] *1st Plan*, II, Part 2, pp. 60–62.

Dwellings, other buildings, and livestock were the only really large items; the total investment, excluding dwelling houses, amounted to roughly 150 rubles per capita. Machinery of all kinds accounted only for 4.4 percent of the grand total.

The average value of the principal means of production owned by the peasant households investigated in 1927 was 516 rubles (Chart 11), roughly equivalent to $260. The average evaluation of the house was 254 rubles. Thus the total property of the average household (without the land, which was state property) did not exceed 770 rubles—not quite $400.

With an average of 5.1 persons per household investigated (Chart 11), the principal means of production amounted to only 100 rubles per capita, and the means of production plus the dwelling houses to about 150 rubles per capita. Part of the difference between this average and the considerably higher one computed from the total investment in rural economy for the Soviet Union as a whole (see above) is due to the inclusion of state and similar properties in the latter figure, and there may have been differences in methods of estimation as well. But the households surveyed apparently were also slightly below the average for the country as a whole.

The households investigated tended to concentrate in groups 4 and 5, with principal means of production valued on the average at 308 and 579 rubles respectively (Chart 11). These two groups accounted for 57.1 percent of all households and thus best represented the average peasantry. Group 6, with 13.9 percent of all households, had an average investment of 1,092 rubles. Only the thin layer of group 7, comprising 3.2 percent of all households, had an investment (2,623 rubles) that might be considered adequate for a very small farm in the United States. The poor-peasant groups 1 to 3 comprised slightly more than one-quarter of all households. Group 1 had no means of production, while groups 2 and 3 had investments of only 55 and 159 rubles respectively.

Horses and cows.—The horse was the peasant's principal means of production. The average peasant's horse was small, and two such horses should be regarded as the minimum draft power needed for even comparatively shallow plowing with a

steel plow. The luxury of two horses, however, was found only in a relatively small proportion of the investigated households. One horse or a pair of oxen per household was fairly typical, and a large proportion of the peasants had none.

The average annual yield per peasant cow over the Union as a whole was not quite 1,000 liters of milk and only slightly more than 1,000 liters if one excludes areas in which many cows were not milked at all. Such a yield is certainly not enough to supply a family of average size with anything like a generous quantity of dairy products, to say nothing of providing a surplus for sale. Yet the households investigated averaged only a fraction more than one cow each, and nevertheless sold part of the milk produced. Only the absence of the one low-yielding cow stamped the peasant as poor; indeed, the expression "cowless" meant just that.

The households investigated averaged only one workhorse, or its equivalent in oxen, and 1.1 cows (Chart 11). Of the two groups of the more representative peasant households, group 4, with the smaller investment, averaged 0.9 workhorse and 1.0 cow, while group 5 averaged 1.2 workhorses and 1.3 cows.

Only the households in the small group 7, with an average of 2.3 workhorses, could normally put into the field the power needed for reasonably adequate plowing. Part of the households in group 6, second highest according to the investment in principal means of production, did not quite come up to this modest standard, since the group as a whole averaged only 1.7 workhorses per household. The households in groups 6 and 7 averaged 1.7 and 2.5 cows respectively.

Horses and cows were naturally absent in group 1, and 95.2 percent of the households in group 2 were horseless. While cows were not quite so scarce, there was only one cow for each 3.3 households in the group. Moreover, cows as well as horses tended to be poorer in the lower peasant groups. Animal draft power was also very scarce in group 3, there being but one workhorse to each 2.5 households. One-third of the households in this group did not have a cow.

Farm machinery.—The differentiation of the peasantry was greatest in machinery. The total value of farm machinery owned

by the average household investigated was only 35.1 rubles or 6.8 percent of the value of the principal means of production. The group without principal means of production obviously had no farm machinery, if simple implements such as the sickle are ignored, while the value of the machinery owned by the households in groups 2 and 3 averaged no more than 1.0 and 3.8 rubles respectively. Even the two intermediate groups, which made up the bulk of all households (201–400 and 400–800 rubles in principal means of production), possessed merely 11.7 and 33.1 rubles worth respectively. A full third of all investigated households had no plowing equipment, not even a sokha (the primitive wooden plow that does not turn the soil), and more than one-third did not have any machinery except for plowing (Chart 11). Only the tiny group 7, with the largest investment in means of production, was relatively well supplied with farm machinery, possessing equipment valued at 254.5 rubles per household on the average. While this group owned 7.2 percent of all workstock (probably substantially more in terms of value), its investment in machinery amounted to 22.8 percent of the total.

Co-ownership and hiring of means of production.—The incredibly small amounts of machinery owned by almost all households, particularly in the lower groups, and the inadequacy of draft power, especially for operations requiring much power, led to a great deal of co-ownership, pooling, and hiring of means of production.

Not less than 16.6 percent of the households investigated owned means of production (probably almost exclusively machinery) in combination with other households. It is noteworthy that the proportion of such households amounted to 27.6 and 28.0 percent in groups 7 and 6 respectively and declined gradually to 7.7 and 2.6 percent in groups 3 and 2 respectively. Correspondingly, the means of production owned jointly went down from 322.3 and 112.2 rubles to 31.4 and 26.9 rubles respectively.[6]

According to a survey made in 1926, only 50.5 percent of the households investigated in the whole USSR worked the land

[6] *Statistical Handbook USSR, 1928*, p. 149.

with their own workstock and implements; in the Ukraine, with its heavier soil, the proportion was as low as 27.1 percent. The more detailed data are as follows (in percent of households):[7]

System of operation	USSR	RSFSR	Ukraine	White Russia
Own workstock and implements	50.5	56.8	27.1	81.8
Hired workstock, own implements	2.7	3.3	1.2	1.5
Own workstock, hired implements	1.3	1.3	1.4	1.4
Hired workstock and implements	24.2	21.3	34.9	8.4
Supryaga (pooling)[a]	15.1	10.3	31.5	0.8
Other methods	6.2	7.0	3.9	6.1

[a] The term strictly means pooling of workstock, but pooling of implements or workstock and implements may also have been included.

The investment in farm machinery by the highest group of the farms investigated in 1927, though small in absolute terms, was very large in comparison with the investments of most other groups. It certainly gave the top group a not inconsiderable economic power which may well have been abused occasionally. But such abuses were greatly exaggerated. The demand for machinery that the machine-lending points leased out at reasonable rates was by no means brisk (pp. 269–70), and this fact suggests that the rates these peasants charged for the machinery they leased were not always nor even frequently excessive. Yet the letting on lease of means of production, regardless of the terms, was sufficient to stamp a peasant household with over 1,600 rubles in means of production as an entrepreneur, i.e., a kulak household, even if the household did not hire any labor (see p. 162).

As shown by the data in Chart 11, hiring of means of production, though most frequent in size groups 2 and 3, was rather common in all groups, including the largest. Not shown in the chart is the noteworthy fact that the highest groups hired mostly machinery, while the lower groups took mainly other means of production, apparently draft power. In the highest group the yearly outlay on the hiring of machinery averaged 25 rubles per household taking it; in the other groups the average was 15 rubles. Fifteen rubles was a large sum for a Russian peasant.

[7] *Ten Years of Soviet Power in Figures 1917 to 1927* [English ed. of the *Statistical Handbook USSR, 1927*], p. 159.

Only part of it, however, could have been overpayment, so far as overpayment was involved.

The letting of means of production (Chart 11) was naturally done mainly by the households with the largest investment. Even in this group, however, little more than one-third of the households did let means of production on lease, but these households averaged an income of 71 rubles from this source, certainly a large sum in the Russian village.[8]

Lending and borrowing of money and produce in kind between private persons played a minor role in the village, and could not have been a means of extensive exploitation. Only 2.4 and 3.4 percent of the households investigated in groups 6 and 7 respectively, loaned money to others; the proportions in these groups who loaned produce to others were 1.0 and 2.0 percent respectively. In group 1, 3.5 percent of the households owed money to private persons; the proportion increased to 13.3 percent in group 7. The proportion of households that owed produce in kind ranged respectively from 1.1 percent in group 1 to 2.4 percent in group 7.[9]

LAND TENURE

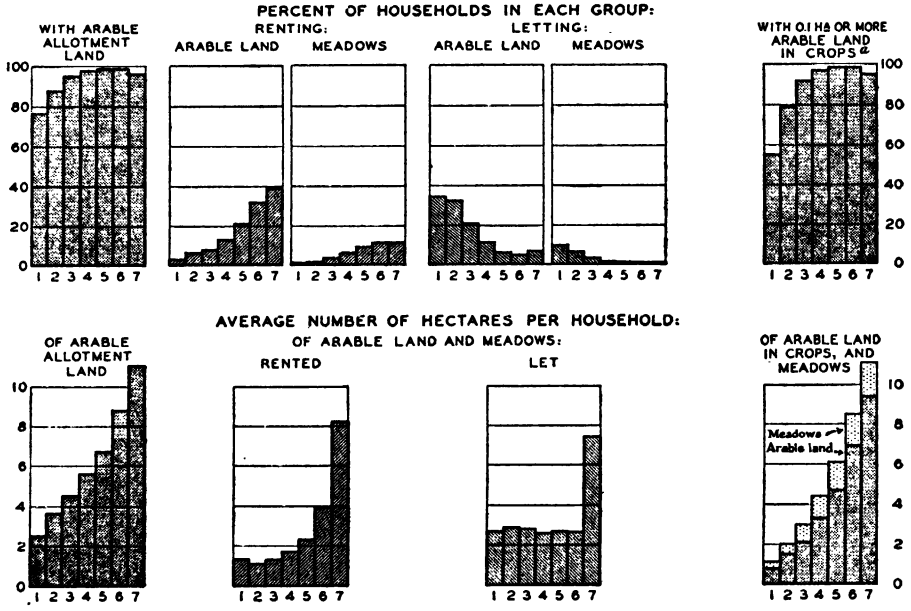
The households investigated averaged 6.1 hectares of allotment arable land and 4.0 hectares of cropped plowland (Chart 12). The households in group 7 had 83 percent more allotment arable land than the average and 135 percent more cropped plowland than the average. An average of 9 hectares in crops on arable land in those households does not indicate great wealth. At the other end of the ladder, in group 1 the average allotment of arable land was equivalent to 41 percent of the average for all investigated farms; their plowland in crops, however, was only 20 percent of the average. These differences were due partly to the fact that the stronger households took more land on lease than they let, while the reverse was true of the households without means of production. Regional factors also were partly responsible (see pp. 179 ff., especially Tables 11 and 12).

[8] An obvious reason for the relatively large letting on lease of means of production by the highest groups was that the lowest groups had so little of these means. Another factor was the limited opportunity for the highest groups to utilize their means of production fully by getting more land to cultivate.

[9] *Statistical Handbook USSR, 1928*, pp. 124–25.

According to Table 11 (p. 181), which shows a grouping by the size of cropped plowland, only 8.8 percent of all investigated households had 8.85 hectares (22 acres) or more of such land, while more than one-third (36.7 percent) had less than 2.3 hectares (5.5 acres). A large part of these differences also was regional.

CHART 12.—PRE-COLLECTIVIZATION PEASANT RURAL ECONOMY: LAND TENURE AND OPERATION*



* Data in Chart Appendix. The averages of hectares of arable land and meadows rented and let (lower tier) are calculated on the basis of the households renting or letting, not on total households.

a Chart Appendix Data here inverted. "Arable land in crops" should read "cropped plowland."

The taking of land on lease and the letting of means of production by the households of the highest group both grew out of the fact that these households were better equipped with draft power and machinery. Both practices, but especially the land leasing, were emphasized by the Party spokesmen as important indications of strong capitalistic development. Actually it was on a small scale. That such a rate could be considered dangerous to the Soviet system merely emphasized the deficiencies of that system.

Two-fifths of the households in group 7, the group best

equipped with draft power and machinery, took land on lease (Chart 12). Those households in this group which took land averaged 8.2 hectares (roughly 20 acres) of rented land. The percentage of households taking land on lease declined rapidly in the lower groups; in group 4, the poorer of the two groups of average peasant households, only one-eighth of all households took land on lease. For those households in group 6, the second highest, which took land on lease, the average area rented was less than 10 acres. The few renting households in the remaining five groups commonly took 3 to 5 acres of land each. The land taken on lease by all households amounted to 6.5 percent of the operated land.

A little less land was let than taken on lease by the households investigated; the balance leased was probably state land, or in any case non-allotment land. The largest percentages of households letting land on lease (Chart 12) were naturally found in the groups without means of production (group 1) or with little of such means (groups 2 and 3). While they had a share in the allotment land, they had difficulty in operating it themselves, and let it to others for payment in various forms. Still, even in groups 1 and 2 only one-third of the households let land on lease, while in group 3 one-fifth of all households belonged in this category. Land was naturally let on lease in tiny lots in these groups; the average per renting household in groups 1 to 3 was little more than one hectare.

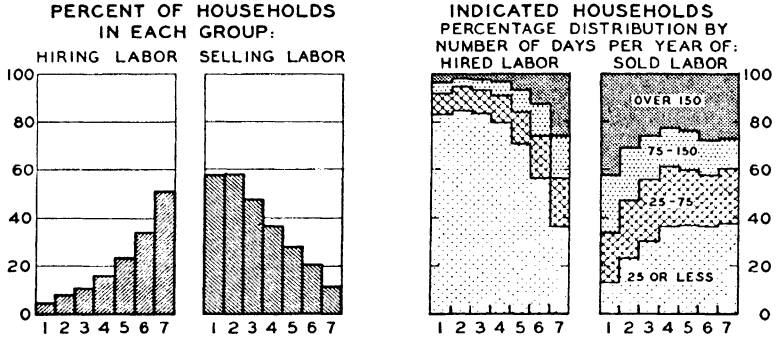
SALE AND HIRE OF LABOR

Income from selling labor naturally declined rapidly from the lower to the higher groups. According to Chart 13, 58 percent of all households in groups 1 and 2 sold labor; one is surprised there were so few. Almost half and more than one-third of the households in groups 3 and 4 respectively sold labor. Labor was sold even by the households in group 7, although only 11.5 percent did so.

There was naturally a great difference in the amount of labor sold per household; the lower the level the greater the amount of labor sold. In group 1, 9.1 percent of the labor-selling households sold more than 300 days per year and 33.5 percent sold 150 to 300 days, while only 13.2 percent sold less than 25 days

of outside work per year. In group 7, on the other hand, more than one-third of the households selling labor sold it for 25 days or less.

CHART 13.—PRE-COLLECTIVIZATION PEASANT RURAL ECONOMY: LABOR*



* Data in Chart Appendix. The "indicated households" in the right-hand boxes are those hiring or selling labor.

While the amount of sold labor was large, it was only a portion of the potential supply. The limited outlets and the poor reward for labor put a low ceiling on this source of income. The Russian peasantry constituted a practically inexhaustible source of labor, provided this could have been sold at anything like decent wages. It is no exaggeration to say that few households below group 6 possessed sufficient means of production to utilize their labor efficiently, according even to the low Russian standards (see pp. 420–23).

In spite of the primitive nature of farming, the seasonal character of its operations, and the large amount of labor sold by the peasantry (much of it far from their own homes), hired help played a small role on the farms investigated, and these were sufficiently representative of the situation in the whole country. This obviously implies that a large part of the labor sold went to enterprises outside the rural economy.

The hiring of labor is shown in Chart 13 for all investigated peasant households. But the survey also permits analysis of the households engaged in rural economy that produced for the market and derived their principal money income from sale of products of rural economy. From these households, referred to below as "market producers," the kulaki were drawn. Of all investigated households, 63.97 percent were classed as market

producers; the percentages were 70.28 in group 5, with 76.40 in group 6, and 82.56 in group 7.

If farming methods had not been so primitive, most of the largest peasant farms would have been able to perform all the necessary work with their own family labor. As it was, little more than half (51.7 percent) of all market producers in the highest group hired any labor. Of these, only 26.0 percent, or 13.5 percent of all market producers in group 7, employed labor for the equivalent of a full-season worker (150 days or more). By definition (p. 162) households with an investment of over 1,600 rubles in means of production were entrepreneurs if they hired labor for over 50 days a year. Little more than one-quarter (26.8 percent) of the market producers in group 7 hired labor to this extent.

In group 6, second highest according to value of means of production, about one-third (33.8 percent) of the market producers hired labor, but of these little more than one-quarter (27.2 percent), or only 9.2 percent of all market producers in the group, hired labor for more than 75 days, the amount that stamped them as rural-economy entrepreneurs as officially defined.

Group 5, with but 400 to 800 rubles worth of principal means of production, was still a source of kulaki provided labor was hired for more than 150 days a year (p. 162). However, while 22.7 percent of the market producers in this group hired labor, only 1.6 percent exceeded his limit. The government really had to go out of its way to fill up the kulak group.

The accompanying tabulation which sums up the foregoing information reveals that 3.17 percent of all households engaged

Households	Group 7	Group 6	Group 5
1. Number in group as percent of all investigated households	3.24	13.85	30.93
2. Number of market producers in group as percent of group total	82.56	76.40	70.28
3. Households hiring labor above minimum for kulak classification:			
as percent of market producers in group	26.84	9.20	1.56
as percent of all market producers	1.12	1.52	0.53
as percent of all investigated households	0.72	0.97	0.34

in rural economy producing for the market, and with products of rural economy their principal source of money income, passed the test on the basis of hired labor. The balance of the kulaki was made up by the households of group 7 which, while not hiring labor for as much as 50 days a year, let means of production on lease. Of the market producers in group 7, there were 14.6 and 11.6 percent, respectively, who, while not hiring any labor or hiring it for not more than 50 days, let means of production on lease. This is equivalent to 1.09 percent of all market producers. Thus kulaki made up 4.26 percent of all households classed as market producers in the rural economy.

Labor was also hired by households of the lower groups, group 1 not excluded, but the proportions of the hiring households were naturally small, ranging from 15.6 percent in group 4 down to 4.7 percent in group 1, and four-fifths of these households hired labor for less than 25 days.

While primitive farm techniques and seasonal factors played a role in the hiring of labor, other important factors were outside work commitments of family members, mainly men, frequently at distant places, and complete absence of male workers in the household. In group 5, for example, only 10 percent of all households hired labor for more than 25 days, and 7.4 percent of all households did not have a man worker in the family.

INCOME AND WEALTH

Suitable data on incomes are apparently available only for 1924–25. The survey of that year unfortunately covered only 9,281 households in the European portion of the RSFSR (Table 10). The smallness of the sample certainly affected the result. An idea of what the incomes are likely to have been in 1927–28 may be gleaned from the fact that national income from agriculture increased by about 25 percent from 1924–25 to 1927–28, while rural population increased only by 6 percent. Stratification of the peasantry strengthened somewhat in the period and hence the spread in incomes became correspondingly larger.

The average total income was naturally small—409.6 rubles per household. Expenditures for food averaged almost 65 percent of the total living expenses of all households. The range from the lowest to the highest group in income was wide, but this

was primarily the effect of the much larger size of the households in the highest group. The variations in income per household were particularly large in the incomes from the peasants' own rural-economy enterprises. However, while this class of income represented four-fifths of the total income in the highest group, it was only 34.6 and 44.2 percent in groups 1 and 2 respectively.

TABLE 10.—INCOMES OF PEASANT HOUSEHOLDS SURVEYED IN 1924–25*

Household group	Cropped plowland (*hectares*)	Total income (*rubles*)			Arbitrary income from rural economy[a] (*rubles*)		
		Per household	Per man-worker	Per person	Per household	Per man-worker	Per hectare agricultural land
1.....	None	206.20	91.30	57.39	71.45	31.63	23.07
2.....	Under 2	333.53	128.80	74.10	147.38	56.91	32.23
3.....	2.01–4.00	361.08	117.68	66.67	220.16	71.75	30.78
4.....	4.01–6.00	415.38	114.52	65.16	282.09	77.78	28.62
5.....	6.01–8.00	485.96	117.17	66.68	345.94	83.40	24.58
6.....	8.01–16.00	603.39	130.20	74.24	451.38	97.40	22.10
7.....	Over 16.00	810.75	152.76	86.22	663.78	125.07	18.03
Average..	.....	409.62	121.27	69.08	258.98	76.68	26.91

Household group	Percent of total income			Expenditures per person (*rubles*)			
	Arbitrary income from rural economy[a]	Income from other enterprises and wages	Other incomes	Living expenditures			Taxes
				Total	Food	Non-food	
1.....	34.6	51.4	13.9	62.49	37.44	25.05	1.71
2.....	44.2	41.8	14.1	72.87	47.30	25.57	1.91
3.....	61.0	28.3	10.7	68.36	44.28	24.08	3.10
4.....	67.9	23.3	8.8	67.25	43.66	23.59	3.82
5.....	71.2	21.1	7.7	67.71	43.38	24.33	4.53
6.....	74.8	18.8	6.4	76.06	48.30	27.76	5.87
7.....	81.9	13.8	4.3	95.22	58.63	36.59	9.08
Average..	63.2	27.1	9.7	70.46	45.41	25.05	3.77

* Data from a survey of 9,281 households in the European portion of the RSFSR, in *Statistical Handbook USSR, 1927* (Moscow, 1927), pp. 135–36.

[a] For definition, see footnote 11 on p. 420.

PER CAPITA DATA

Since the number of persons per household varied considerably, the real degree of stratification of the peasantry is better reflected in per capita than in per household data. This is shown

in the tabulation below with reference to the three standard indicators of the peasant's wealth. Since there was so little cropped plowland and only a fraction of a horse and cow per capita, it seemed preferable to present the data per 10 persons. The data from the 1927 survey of 615,400 peasant households are thus summarized according to principal means of production:[10]

Household group	Principal means of production per household (*value in rubles*)	Per ten persons		
		Arable land in crops (*hectares*)	Number of workstock[a]	Number of cows
1	None	3.1	None	None
2	1– 100	4.2	0.3	0.8
3	101– 200	5.2	1.0	1.7
4	201– 400	6.7	1.8	2.0
5	401– 800	8.5	2.2	2.4
6	801–1600	10.3	2.6	2.6
7	1600 and over	12.9	3.1	3.4

[a] In terms of workhorses.

The variations in per capita amounts of cropped plowland, workstock, and cows among the various size groups of households were due partly to regional factors (see below). The variations caused by other factors were certainly less than those observed in many other countries, but were extremely important nevertheless. The difference of one-quarter of a hectare or one-tenth of a workhorse or cow per capita often meant the difference between a full coverage of an extremely moderate minimum of subsistence and outright starvation, unless the households with little of their own means of production succeeded in supplementing the income from their own enterprises by proportionately large incomes from the sale of their labor.

The data presented testify again and again not to the wealth of a considerable portion of the households, but to the poverty of practically all. Thus the second richest group of farmers had for each person in the household only one hectare of arable land in crops commonly yielding only small returns, one-quarter of a small Russian horse, and the same portion of a very low-yielding cow. If each person (including the hired help) in group 6

[10] *Statistical Handbook USSR, 1928*, pp. 144–45.

had consumed a pint of milk per day and 10 pounds of butter per year, most households in that group would have had to buy milk or dairy products. An income adequate even by the Russian peasants' moderate standards could not be produced with less means of production per capita than this group possessed.

The total income per person in the highest group of the 1924–25 survey (Table 10) exceeded that of the lowest group by about 50 percent. The per capita living expenditures did not show extreme variations among the various peasant groups. The expenditures for food amounted to much more than one-half of the total, even in the highest group. Indeed, the non-food expenditures in the higher groups did not show any greater rise than that of expenditures for food, as almost uniformly occurs in statistics of this sort. The highest peasant group was adequately provided with food, clothes, and so on, but on the modest Russian-peasant scale.

REGIONAL VARIATIONS

Data pertaining to the country as a whole exaggerate the extent of differentiation of the peasantry, owing to substantial regional variations in the factors used in the analysis. The results of the 1927 survey unfortunately are not presented in sufficient detail on a regional basis. However, a survey of about 15,000 households in 1925–26 yielded the following figures on cropped plowland in specified areas (in hectares per capita):[11]

Northern region	0.42	North Caucasus	1.45
Leningrad and Karelia	0.48	White Russia	0.68
Moscow region	0.52	Ukraine	
Ural	0.93	Forest and forest-steppe	0.75
Middle Volga	0.96	Steppe	1.45
Lower Volga	1.21	West Siberia	0.95

The distant areas, relying mainly on dry farming, had more land per capita than in the Union as a whole. North Caucasus, with its large Cossack population, and the drier part of the Ukraine, were highest. Similar areas in the Lower Volga region and West Siberia also had large average acreages. On the other hand, the amount of cropped plowland per person was com-

[11] *Statistical Handbook USSR, 1928*, p. 136.

monly much smaller than the average for the Soviet Union in areas specializing in fibers or fruits, in those emphasizing animal husbandry of the extensive type, and in those where many were engaged in forestry, hunting, and non-rural work.

While land was relatively much more abundant in southeastern European Russia and Siberia than in the rest of the country, the prices of farm products were necessarily lower there because of the long distances from the deficit areas. Moreover, both the southeastern part of European Russia and the adjacent areas in Asia (Kazakhstan and southern Siberia) have lower per acre yields than the rest of the country, and are not adapted to such labor-intensive crops as potatoes and sugar beets. The considerably larger amount of cropped plowland per household in these areas implied the necessity of more draft power and machinery. Thus the average peasant enterprise tended to be larger there, if measured in investment in means of production or in the number of workstock. None of the areas of this type is shown separately in the published results of the 1927 survey analyzed above.

Uzbek, the principal cotton-growing republic in the USSR, where all cotton is irrigated and yields are high, is a good example of peasant farming on little land. This republic averaged only 2 hectares of cropped plowland per household in 1927 (Table 11), or 0.44 hectare per capita. Correspondingly, the number of other indicators of the size of enterprise was small. There was but 0.7 workhorse per household in that republic as against the Union average of 1.0. All principal means of production averaged only 337 rubles per household in Uzbek. While for the Union as a whole groups 2 and 3 of the 1927 survey comprised 22.7 percent of all households, 47.6 percent of all investigated households of Uzbek fell in these groups; groups 2, 3, and 4 made up three-quarters of all households there. Under average Russian conditions the households of groups 2 and 3 were paupers unless they could supplement their income adequately from enterprises other than their own farming. Uzbek peasants of the same groups were not so poorly situated, however, owing to the high income per hectare of cotton.

South Caucasus offers an example of peasant farming in

which relatively large investment is associated with little cropped plowland. With its vineyards, orchards, and sheep herds, South Caucasus had a much higher average value of principal means of production per household and several times as large a proportion of households in group 7 than was true of the Union as a whole (Table 12). But the averaged cropped land per household was only 1.7 hectares; and, with cropped plowland as the basis of grouping, almost all households were bunched in the lower groups (Table 11).

TABLE 11.—DIFFERENTIATION OF THE PEASANTRY AS MEASURED BY CROPPED PLOWLAND, USSR AND SPECIFIED REGIONS, 1927*

(Percent of total, except for last line)

Hectares per household	USSR	RSFSR	Ukraine	White Russia	South Caucasus	Uzbek	Turkmen
Under 0.10	6.3	6.3	3.7	1.4	16.0	17.0	5.6
0.10- 1.19	13.1	12.9	8.3	5.6	31.6	30.6	31.3
1.20- 2.29	17.3	17.3	14.7	17.5	27.8	20.9	29.5
2.30- 3.38	17.1	16.6	19.0	25.9	13.3	13.1	16.1
3.39- 4.47	13.5	13.2	15.7	20.2	5.4	7.9	8.9
4.48- 6.66	16.2	16.3	18.8	20.3	4.0	6.9	6.3
6.67- 8.84	7.7	8.1	8.6	6.2	1.0	2.4	1.6
8.85-11.03	3.7	3.9	4.5	2.0	0.4	0.7	0.5
11.04-17.59	3.7	3.9	4.9	0.8	0.4	0.4	0.2
17.60 and over...	1.4	1.5	1.8	0.1	0.1	0.1	...
Total	100	100	100	100	100	100	100
Average hectares per household.	4.0	4.0	4.7	3.7	1.7	2.0	2.1

* Data of survey of 615,400 peasant households in 1927, *Statistical Handbook USSR, 1928*, pp. 128-30, 144-45, and 150-51.

White Russia is noteworthy for the particularly small extent of stratification in its peasant farming. In the 1927 survey it showed a considerably greater predominance of average households (groups 4 and 5) than was the case in the Union as a whole (Table 12). No more than 5.5 percent of the White Russian households belonged to groups 1 and 2, as against 13.6 percent for the entire country, and 12.2 percent to groups 6 and 7, as against 17 percent in the Union as a whole. Correspondingly, 70.2 percent of all households of White Russia were in groups 4 and 5 (as against 57.1 percent in the Union). A great concen-

tration of White Russian households in the intermediate groupings is also observed on the basis of arable land in crops (Table 11). There, only 7.0 percent of all households were in the two lowest groups as against 19.4 percent for the Union as a whole, and only 2.9 percent were in the three highest groups as against 8.8 percent for the Union.

TABLE 12.—DIFFERENTIATION OF THE PEASANTRY AS MEASURED BY VALUE OF PRINCIPAL MEANS OF PRODUCTION, USSR AND SPECIFIED REGIONS, 1927*

Household group	Group range (*rubles*)	Percent of total (except for last line)						
		USSR	RSFSR	Ukraine	White Russia	South Caucasus	Uzbek	Turkmen
1	None	3.0	3.2	3.0	0.7	3.0	2.7	3.2
2	Not over 100	10.6	10.1	10.3	4.8	12.4	25.7	15.5
3	100- 200	12.1	12.0	10.6	12.1	11.4	21.9	17.7
4	200- 400	26.2	27.0	21.9	35.6	21.9	26.9	29.5
5	400- 800	30.9	31.6	32.1	34.6	24.9	15.7	23.0
6	800-1,600	13.8	13.3	18.3	10.6	15.1	4.9	7.9
7	Over 1,600	3.2	2.9	3.9	1.6	11.3	2.2	3.2
	Total	100	100	100	100	100	100	100
Average per household (rubles)		516	496	585	487	761	337	435

* Survey of 615,400 peasant households in 1927. *Statistical Handbook USSR, 1928*, pp. 92–93, 96–97, 146–47, and 152–53.

CHAPTER IX

PRE-REVOLUTION INCOME AND PRODUCTION

INCOMES

Poor in agricultural resources, yet with some 75 percent of her population depending on the land for a livelihood, Czarist Russia naturally had a very small national income. For 1913 it was estimated at 14 billion 1913 rubles or around 100 rubles per capita.[1] Although the strata of the rich was very thin, their income was so far above the general level that the average income of the rest of the population was well below the figure given. Incidentally, the lavish and conspicuous spending by these relatively few rich at home and abroad greatly contributed to spread the fable of Russia's immeasurable wealth. India presents an exaggerated case of the same sort.

Obviously, only a predominantly agricultural country, as Russia was then, could function with so small a national income as the one indicated. The income from agriculture, which had to provide for about three-quarters of the total population, was estimated for 1913 at 6.72 billion rubles,[2] or about 67 rubles per capita of the agricultural population. In the poorest areas the average yearly income of the mass of the peasants was as low as 35 rubles. One could not afford even a moderately good diet or much of anything else with 40, 50, or even 67 rubles a year. The peasants ate what they could produce most readily with their primitive techniques. In most areas this was grain. They ate it in the form of khleb[3] (baked bread) and kasha (a stiff porridge), and drank it in the form of kvas (a slightly fermented beverage made in the home from baked bread—the beer of the ancient Babylonians and Egyptians) and vodka. Their per capita consumption of grain amounted to the quite sizable total

[1] *1st Plan*, I, 146. A 1913 ruble was equivalent to 51.5 American cents.

[2] Estimate of S. Strumilin, chief statistician of the Gosplan. See B. Gukhman, "Development of Production (1913–1928)," *Economic Review*, September 1929, p. 117.

[3] The Russian term for grain and baked bread. In the broad sense "khleb" means grain and all products from it, including flour and bran.

of about 265 kilograms per year (not including the grain used in factory-made beer, liquor, and starch)—about double the United States rate in 1913. Where the climate permitted their production, potatoes formed an important supplement to grain. An average of perhaps 15 kilograms of meat and 5 kilograms of fat, a great deal of three vegetables,[4] and a negligible amount of fruits filled out this very restricted diet.

In most countries of the world the consumption of bread declines with the increase in consumption of other foods. It has been proved beyond doubt that well-to-do Russian peasants consumed not only more of other foods than did the poor peasants, but more bread as well. The poor could not afford even bread in the quantities they wanted. Furthermore, the consumption of bread grain in Russia showed a close direct correlation with the harvest. When God gave less, the proportion of those who did not eat as much as they wanted increased considerably.[5]

The urban population was small and incomes were generally low, particularly considering the high living costs in cities as compared with the rural areas. Most of the city dwellers had to be satisfied with the cheapest diet. They relied on bread and porridge as their principal sources of nourishment to only a slightly lesser extent than the rural population. While meat consumption was fairly large in cities, the meat consisted mainly of beef and veal of poor quality, available at low prices in relative abundance. The consumption of good meat, dairy products, fruits, and more expensive vegetables was almost negligible.

The low purchasing power of almost all of Russia's population, rural and urban, could not fail to put a heavy damper on the production of the more valuable farm products.

FARM MACHINERY AND FERTILIZER

The great predominance of the small-scale, essentially subsistence-type farm in Russian agriculture was discussed in some

[4] Except for the highly seasonal and regional watermelons and cantaloupes, the vegetables consisted almost exclusively of beets, cucumbers, and especially cabbage. N. P. Oganovskii ("Production and Marketing of Perishable Products," *Economic Review*, May 1926, pp. 37–38) specifically made the comparison with the United States to emphasize the poor composition of the Russian vegetables.

[5] See, for example, A. Obukhov, "Methods of Computing the Marketed Grain," *Economic Review*, April 1926, pp. 77–78.

detail on pages 146–50. The average household rarely had more than one small horse and virtually no machinery. An enormous disproportion between the supplies of labor and of capital was one of the principal characteristics of Russian peasant farming.

Table 13 clearly shows the low technical level of Russian farming, indicating a mere sprinkling of more advanced methods. Censuses of farm machinery were taken in 1910 and 1920.

TABLE 13.—FARM MACHINERY IN RSFSR, 1910 AND 1920*

(*Thousand machines*)

Type of machinery	1910	1920
Plowing implements	10,877	9,012
Sokhi, kosuli, and wooden plows	8,576[a]	4,604
Iron plows	2,251	4,278[b]
Harrows	13,143[c]	8,508
Iron	151	453
Seeding machines	72	127
Harvesting machines	417	709[d]
Hay mowers	196	344
Threshers	310	728
Animal-drawn	273	179
Steam	4.0	3.6
Winnowers	916	835[e]
Butter-making machines	...	62[f]

* *Russian Agriculture in the XXth Century*, edited by N. P. Oganovskii and N. D. Kondratiev (Moscow, 1923), pp. 122–31.

[a] In a larger territory the 1910 census counted 6,377,600 sokhi, 833,000 even more primitive kosuli, and 2,089,300 wooden plows.

[b] In a larger territory 82,600 plows with more than one bottom were counted in 1920.

[c] In a larger territory the 1910 census counted 4,592,200 harrows wholly of wood and 13,682,400 wooden harrows with iron teeth.

[d] Of the 528,100 grain harvesters counted in a larger territory, only 41,100 were binders.

[e] Almost all machines of the most primitive type.

[f] In a larger territory than for the other items.

In using the data for 1910 one must consider that since both domestic production and imports of machinery were large in 1911–14, the number and composition of machinery were more favorable in 1914 than in 1910. The 1920 census reflected the improvement in the composition of the machinery from 1911 through 1914, but the quantity of all machinery was considerably reduced during the war and Civil War through destruction and obsolescence.

In 1910 nearly 60 percent of the plowing equipment consisted of implements that did not turn the soil, essentially the same contrivances that were used in the time of Christ. The peasants clung to those archaic plows for two reasons: the few rubles an iron plow cost represented a fortune to virtually all of them, and the one small horse that most of them possessed could not pull even the smallest plow constructed to turn the soil. Since each "sokha" and "kosulya" was used on a much smaller acreage than each genuine plow, the acreage plowed by these primitive implements was much smaller than their numbers suggest.

The adverse effect of the sokha on crop yields is commonly overstressed in the USSR. The use of the sokha and similar primitive implements affected mainly the outlay of power and labor rather than the yields. When using the sokha, it was customary to plow the same land at least twice, usually three times, and occasionally four times, before putting in the crop.[6] This repeated plowing required very large amounts of horse and especially man labor. According to the survey cited, ten days or more of horse and man work were spent in plowing one desyatina (2.7 acres).

Fortunately the sokhi and kosuli were fast disappearing. In Central and especially Northern Russia, where most of them were concentrated in 1910, a feverish shift to the iron plow was in evidence in the succeeding years.[7]

The small numbers of plows with more than one bottom, of seeding machines, grass mowers, and so on, speak for themselves. The few grain harvesters consisted mostly of mowers that only cut the grain. Some of the mowing machines were equipped to lay the cut grain into swaths, but reaper-binders were rare. Furthermore, there were only 6,800 steam threshers in almost the whole country covered by the census. Harvesting by hand with the sickle or scythe was still the common practice.

[6] *Work Norms in Agriculture in Conjunction with Agricultural Techniques*, Central Statistical Board (Moscow, 1927), p. 8.

[7] In the whole non-Chernozem zone the increase was from 361,300 in 1910 to 1,897,700 in 1920. See *Russian Agriculture in the XXth Century*, ed. by N. P. Oganovskii and N. D. Kondratiev (Moscow, 1923), p. 130. See also V. P. Timoshenko, *Agricultural Russia and the Wheat Problem* (Stanford University, 1932), p. 215.

Primitive threshing implements, such as the flail and animal-drawn rollers, greatly predominated.

The use of modern machinery was largely a regional matter. The so-called non-Chernozem zone in European Russia had one-half of all sokhi, kosuli, and wooden plows in 1910, and only 10 percent of the genuine plows. The same zone had only 1.9 percent of all harvesters, including grass mowers. Don oblast alone had more than eight times as many such machines as the whole non-Chernozem zone. The binders were practically confined to the outskirts of the country. However, even the regions of new colonization, where land was relatively plentiful, were poorly equipped with machinery. The whole of Siberia, including the part adjacent on the south (the so-called Steppe krai, now Kazakhstan), listed only about one hundred steam threshers.

Manuring was standard practice in the non-Chernozem zone, where the poor soil urgently needed it and where forests provided the fuel. The quality of manure was adversely affected by the poor quality of the feed. In the treeless south, manure mixed with straw was used for fuel.[8] The use of commercial fertilizer was limited to about 250,000 tons in the whole country.

PRODUCTION

Official statistics of crop production in Czarist times were characterized by underestimation. The amount of grain and sugar beets produced can be reconstructed with a sufficient degree of accuracy from information on the disposition of the harvests, but the output of most other crops and of animal products may remain uncertain forever. Except for grain and sugar beets, all comparisons of pre-World War I data with those for the subsequent years must be considered tentative. For a general picture, however, the available information is sufficient.

The utilization of the cropped plowland was largely determined by climatic conditions, but poverty and backwardness were greatly in evidence. According to the Gosplan, the distribution of cropped plowland in 1913 was as follows:[9]

[8] For details see Timoshenko, *op. cit.*, pp. 205–07.

[9] *Control Figures of the National Economy USSR for 1928–29*, Gosplan (Moscow, 1929), pp. 408–09.

Crop		Million hectares
Total cropped plowland		116.7
Grain		102.7
Technical crops		5.5
Cotton	0.7	
Sugar beets	0.6	
Flax[a]	1.5	
Oilseeds[b]	1.9	
Other crops		8.5

[a] Oil-flax subtracted; figure from *Cropped Plowland USSR, 1938*, p. 11.
[b] Oilseeds grown for seed only.

Almost 90 percent of the cropped plowland was in grain. Moreover, more than two-thirds of this was food grain, namely bread grain (wheat and rye), porridge grain (buckwheat, millet, rice), and dry legumes, customarily included in Russia and the USSR with the grain proper.

Potatoes were the most important non-grain crop. However, three million hectares of potatoes was little enough, even though much of the country is climatically unadapted to potato growing. The smallness of the potato acreage reflected the compulsory maintenance of the three-field system on communal land (p. 136). While the production of vegetables was substantial, coarse vegetables, especially cabbage, greatly predominated.

Technical crops, which comprised less than 5 percent of the total cropped plowland, included not only such valuable products as sugar beets and fibers, but also a great deal of sunflower and other oil-bearing crops, the return from which yielded little if any more per acre than grain.

Of the 30 million hectares in feed grain (oats, barley, and corn) in 1913, about 17 million were in oats, used principally as feed for workstock. A considerable amount of oats and a large part of the output of barley and corn were exported. Little feed grain was retained for the productive livestock. Of the total arable land, only 1.9 percent was in sown grasses—a negligible area. Feed roots were not grown at all. Thus pastures and meadows, and especially the coarse by-products of crop production, were almost the only sources of feed for productive livestock. While a large part of the concentrated by-

products was exported, even the poorest straw was extensively used for feed. When the harvest failed, the old rotten straw that formed the roofs of the peasants' huts was taken down and fed to the stock.

Owing largely to natural conditions, only small returns were obtained from the land. In 1913 the yield of all grain was around eight quintals per hectare, or 11.9 sixty-pound bushels per acre.[10] The yields of most other crops were correspondingly low.

The figures on productive livestock are impressive by themselves, but those on the output of animal products are much less so, especially when related to population. The 1916 census disclosed the following numbers (summer count), in millions:

Cattle	60.3
Cows	25.9
Hogs	20.3
Sheep and goats	121.0

The livestock figures of the 1916 census are believed to be applicable also to 1913[11] and are always so used in the USSR. Data on age composition shown by the 1916 census seem never to have been used to shape an approximation of prewar herds. The data for the short-lived hogs and sheep cannot be used for this purpose, but those for cattle and horses can. The proportions of young cattle in the cattle herds imply about normal breeding in the preceding three years. This would indicate that the total herd was either the same or moderately larger in 1916 than in 1913. But since slaughtering probably was above average in intermediate years it seems correct to assume that herds in 1913 and 1916 were about the same. Breeding of horses was definitely slight in 1913–15. Colts under one year and young horses below working age represented only 10.6 and 11.8 percent of the total in 1916, as against 11.4 and 20.6 percent in 1927, a fairly normal year. Since a great number of adult horses were drafted for the army before the 1916 census, it is very likely that there were considerably fewer

[10] Trend-value, as estimated by the Gosplan.

[11] A. E. Lositskii, "The Present Livestock Situation," *On the New Path* (Moscow, 1923), V, Part 1, p. 115.

horses in 1916 than in either 1913 or, on the average, in 1909–13.[12]

Virtually all productive livestock was raised on grass from land not usable for arable purposes, and on by-products of crop production. That little salable produce was used is especially true in the case of cattle. Outside the areas of nomadic and seminomadic agriculture, practically no cattle were raised for meat alone. The best beef was from work oxen finished on residuals of sugar-beet processing. Most beef and veal was a by-product of milk production, but even the cows were fed negligible amounts of concentrates and were rarely finished before slaughter (Table 63, p. 753). The typical hog was raised as a scavenger animal or on pasture, and at the age of 1½ to 2 years was finished in a few weeks on grain. The total outlay of grain per pound of live weight of such hogs was only about half as much as was customary in the United States and most other countries. The Russian chickens were typically left to find their own food in yards, barns, and so on. The average outlay of feed per chicken was about one-quarter of what was usual in other countries. The raising of hogs and production of eggs by modern methods was only beginning and was not very profitable.

This standard manner of feeding and, generally, of keeping livestock implied hardy animals able to look out for themselves. This was also true of the peasant's horse, which for long periods had to subsist on straw only. But not much work could be expected from such a horse, and returns from the productive livestock were also necessarily small. The average milk yield per cow was around 1,000 liters per year, while hens would average fewer than 50 eggs. Hence the total output of livestock products was also small.

The low productivity of the livestock was due to many factors, other than the poor natural resources, most of which can be reduced to the poorness and backwardness of the country. The negative effect of the restricted domestic market for animal

[12] The computations of A. N. Antsiferov and others in *Russian Agriculture during the War* (London, 1930), pp. 169–80, showed increases, from 1914 to 1916, of 66.7 percent for hogs, 53.7 percent for sheep and goats, 24.9 percent for cattle, and 10.7 percent even for horses. These were made by comparing uncomparable data and should not be used.

and higher-priced crop products has already been emphasized. There were also great difficulties in dealing with the foreign markets. Russia exported large quantities of butter and eggs, but both products were of poor quality and brought low prices. One characteristic of Russian-exported butter, disliked by consumers, was its high salt content. The butter was therefore used in importing countries only for cooking. Faulty processing techniques and poor transportation facilities were to blame for the inferior quality of the butter. Russia had only a small number of dairies, mainly in West Siberia and the Baltic States, and farm butter was commonly produced with no appliances whatsoever. Only 62,400 butter churns were counted on farms in 1920 in almost the entire Union covered by the machinery census. The returns on exported butter were too small to justify large production inputs, such as the purchase of concentrated feed for the cows.

Exported eggs also brought low prices in importing markets because of the lack of refrigeration facilities for storage and transportation. The returns were too small to warrant production on a large scale by other than scavenging chickens.

Russia was ill adapted to compete with more advanced countries in the production of bacon for the English market. This was a matter of breeding the right kind of hog, feeding it the right kind of feed, and slaughtering and shipping it in the right ways. All these things the Danes did admirably then and do even better now. Denmark's favorable geographical location was of course a big factor in her exports of animal products.

MARKETINGS[13]

Because the agricultural output was small relative to the huge rural population, a great deal of the total was needed for consumption on the farm. Yet even many small peasants had to sell a certain part of their meager produce in order to pay taxes and buy such indispensables as their primitive implements, nails, salt, kerosene, and textiles. Witte's famous statement, "We will not eat enough but will export," applied to almost all sales of the great mass of Russian peasants. The few large

[13] See general footnote to Table 3, p. 79, for definition of marketings.

owners and well-to-do peasants naturally sold most of their produce. The flow of farm products from all sources thus made an imposing total.

Since the peasants in such a backward country have to retain a large proportion of their farm produce, the Party's later complaints that they sold only negligible quantities were not justified. It was statistically incorrect to substantiate those complaints by relating marketings to the gross production of the peasantry. Marketings obviously should be related to the volume available for sale and for consumption in the farm home, rather than to gross production. For example, the grain marketed before World War I amounted to almost 25 percent of the total output. The percentage rises to about 40 if seed and feed for draft animals is deducted, and still higher if the feed used for raising the marketed animals and for the output of the marketed animal products is taken into account. The farmers marketed their entire sugar-beet crop and most of the cotton, oilseeds, and flax, but retained most of the hemp. They sold about half of the eggs and more than one-third of the meat they produced. While most of the milk was consumed on the farm (there was little enough of it, at best), butter was made in the home almost exclusively for sale or was produced in dairies from delivered milk. All in all, in terms of value, about as much produce was sold as was consumed in the farm homes.[14]

The proportions marketed by the various classes of producers naturally differed greatly. The now standard computation for grain in 1913 is that by Nemchinov,[15] who distinguished three groups of producers: (1) landlords, (2) kulaki, and (3) average and poor peasants. The first group, producing 12 percent of the total, contributed 21.6 percent of all grain marketed. The kulaki produced 38 percent of the total and supplied half of the marketings.[16] The average and small peasants, who produced the other half of the grain, supplied 28.4 percent of the marketed quantity.

[14] Data on marketings in 1913 in Table 18, p. 223.

[15] Joseph Stalin, *Problems of Leninism* (9th ed., Moscow, 1934), p. 317.

[16] Nemchinov had to widen the classification of the kulaki considerably to arrive at such large percentages.

The marketings of farm products (especially grain) in Russia had one interesting feature not found in countries with higher living standards. There was no full correlation between marketings and harvests. Large quantities of grain were marketed and exported even in years of crop failure. This was due partly to stockpiling by peasants in good years and the disposal of reserves in poor years to a greater extent than is common in highly commercialized countries. A large proportion of the peasants wanted reserves *in natura* rather than in money. Delayed movement of grain to market by water had some influence on the discussed phenomenon. An important factor in the disproportionately large sales in poor crop years was the variation in consumption as already mentioned. The poorer the crop, the greater the proportion of peasants who did not eat enough, even of bread. The reduced consumption by peasants helped to maintain marketings in bad years. Thus there existed the paradox of the very poverty of Russia exerting a stabilizing influence on the world grain markets.

EXPORTS

Russia's small urban population with its low per capita purchasing power naturally could absorb only part of the products marketed by farmers. The result was that this greatly overpopulated country, with a predominantly subsistence-type agriculture, was one of the largest exporters of farm products in the world. The Commissariat of Agriculture estimated the average value of agricultural exports in 1911–15 (probably the crop years 1910–11 to 1914–15) at 850 million rubles at 1913 farm prices.[17] This was about one-eighth of the volume available for sale and consumption in the farm home. If only peace years were taken, the figure would be somewhat higher.

The exports of farm products were dominated by grain even more than were domestic production and consumption (Table 14). In the last few years before World War I, Russia exported annually not less than ten million tons of grain, amounting (with millfeed) to about half of the agricultural exports by value.

[17] *The Bases of a Tentative Plan of Development of Agriculture and Forestry*, Commissariat of Agriculture RSFSR (Moscow, 1924), p. 46.

Flax was the most important item among the other exported crops. There was also a sizable sugar export, bolstered by large export premiums and other supporting measures.

TABLE 14.—RUSSIAN EXPORTS OF PRINCIPAL AGRICULTURAL PRODUCTS, 1911–13 AVERAGE*

(Thousand tons except as noted, and million rubles)

Item	Quantity	Value
Total	...	1,332.8
Vegetable products	...	978.7
Grain[a]	10,317	594.6
Wheat	3,467	239.1
Barley	3,667	184.7
Millfeed	813	33.6
Oilcake	700	37.4
Flax	295	93.5
Hemp	67	20.0
Sugar	326	50.2
Oilseeds	613	27.1
Animal products	...	354.1
Butter	76	70.5
Eggs	3.55[b]	87.7
Hides	54	56.3
Poultry, live	9,414[c]	8.4
Poultry, dressed	14	6.5
Horses	102[c]	12.5
Wool	17	10.0

* *Russian Agriculture in the XXth Century*, pp. 302–03. Boundaries of 1913.
[a] Including flour and dry legumes.
[b] Billion eggs.
[c] Thousand animals.

Animal products made up only 25 percent of the total agricultural exports by value in 1911–13. Almost two-thirds of these exports consisted of eggs, butter, and raw hides—the latter of course a by-product. Few animals (other than horses) and little meat were exported. Geese, live and dressed, made up a substantial part of the total exports of slaughter animals and meat.

The dominance of grain in Russian agricultural exports was due primarily to the conditions in importing markets, most of which favored imports of vegetable produce (especially raw

materials and feed) over animal products. Some importing countries made imports of certain animal products virtually impossible. This was particularly true of Germany, Russia's natural foreign outlet, which strictly regulated imports of cattle and beef. Butter and eggs, the two principal items in Russian exports of animal products that were not by-products, were less restricted by the German tariff. These commodities, especially butter, also found a market in the United Kingdom. The large proportion of geese in the Russian exports of live and dressed animals also was due to the relatively low import duty in Germany.

Russia's general backwardness, especially in processing and transportation techniques, however, also was a factor in the small share of animal products in the total exports of farm products. The inferior grades of butter and eggs not only affected prices, but limited the amounts that could be sold and the supplies for export. The most outstanding evidence of the backwardness of Russian agriculture was the fact that the country exported the huge quantity of 1.5 million tons of millfeed and oilcake, the most valuable concentrates for milk cows. This was due in part to the remoteness of the milling and oil-pressing industries from the dairy areas,[18] but the principal factor was failure to realize the usefulness of bran and, especially, oilcake. Almost every pound of sunflower-seed cake was exported; when World War I stopped this trade, the cake was largely used for fuel. Substantial amounts of cottonseed cake were apparently used as fertilizer in Central Asia and in South Caucasus.

There is no need to emphasize the fact that only part of Russia's exports represented genuine surpluses. Hides, for example, were exported because the peasants could not afford leather shoes and used self-made woven articles of bast instead. The eggs that remained in Russia after a substantial portion of the total output was exported averaged only around 70 per capita, while of butter less than two kilograms per capita remained for domestic consumption.

[18] Milk production was largely concentrated in the north and in West Siberia, most of the commercial mills were in the south, while the production of oilcake was mainly confined to the southeast—the sunflower area.

RIGIDITY OF PRODUCTION

Small-scale peasant farming of an essentially subsistence nature, operated with very primitive machinery, commonly shows extreme rigidity. Even the natural tendency to expand with the growth of population occurs freely only so long as the expansion can proceed along familiar lines. Russian pre-Revolutionary peasant farming was largely of this type. The market-minded sector should not be overlooked, however, especially since it was on the increase.

The well-to-do farmers and landowners were naturally the first to respond to market demands. Since these groups were responsible for a relatively large proportion of the total production, and especially of marketings, Russian agriculture as a whole was much more market-minded than appears at first glance. Even the production of grain was affected by the market. Part of the great expansion of wheat and barley production came in response to the preference of domestic urban and foreign consumers for wheat bread, and to Germany's demand for barley as hog feed.[19] While butter exports (75,000 tons) represented only about one-fifth of the total production, the West Siberian output was almost exclusively for foreign markets. The situation was similar with eggs, except that the area of concentration of egg production, and especially of production for export, was in the Central Chernozem and adjacent regions. The exported geese were raised specifically for that purpose.

The considerable dependence of Russian agriculture on the market is even more strongly reflected in its reactions to price changes. The 1880's and 1890's were a period of world agricultural crisis. Russian agriculture reacted to this by coming to an almost complete standstill in spite of the rapidly growing population. The low prices of farm products justified neither an extensive colonization of less-populated outlying areas nor the movement of seasonal workers to such areas.

The substantial improvement in international markets for farm products in the early 1900's brought to Russia a wave

[19] N. D. Kondratiev, *The Grain Market and Its Regulation During War and Revolution* (Moscow, 1922), pp. 5–25, 212–13.

of prosperity of proportions that seem unbelievable at first glance. However, Russian agriculture possessed a large potential of productive capacity accumulated in part through the two preceding decades of stagnation. A further expansion of the potential occurred through emigration to Asiatic Russia and purchase of machinery,[20] when improvement in international markets made this profitable.

The computations of the expansion from 1900 to 1913 quoted below are not only official, but were prepared with the participation of the best agricultural economists the country possessed. Both 1900 and 1913 were good crop years, although 1913 possibly was slightly better. According to the Zemplan (planning section of the Commissariat of Agriculture RSFSR),[21] volume of production, prices, and returns in 50 provinces of European Russia showed the following percentage increases between 1900 and 1913:

Products	Production	Prices	Returns
Grain	39	33	85
Industrial crops	44	32	90
Animal products	27	64	108
Gross agricultural production	33.8	40.9	88.5

The rural population of the designated area grew by 19.1 percent during the period, making an increase of 12 percent in gross production per person.

North Caucasus and Siberia (not included among the 50 provinces), with their relatively large farms and, at that time, relatively large stretches of unused land and very great inflow of immigrants (Siberia) or seasonal farm help (North Caucasus), were in much better position than the old areas to take advantage of the improved market situation. While the cropped plowland in European Russia (1922 boundaries) was expanding 6.4 percent from 1901–05 to 1911–15, North Caucasus, Siberia, and the Steppe krai were registering increases of 47.2, 70.8, and 63.0 percent respectively.[22] Since the livestock in-

[20] The purchases of farm machinery, which had amounted to the amazingly low figure of 8 million rubles in 1879 and totaled only 28 million rubles as late as 1900, averaged 111 million annually in 1911–13. See Y. Nikulikhin, *Industrialization of Soviet Agriculture* (Moscow and Leningrad, 1931), p. 131.

[21] *The Bases of a Tentative Plan . . . .*, p. 8.

[22] *Russian Agriculture in the XXth Century*, pp. 106–07.

dustry in these areas expanded correspondingly, the increase in both total and per capita agricultural production in all Russia (1922 boundaries) from 1900 to the outbreak of World War I was materially greater than that shown for the 50 provinces.[23]

The fact that output of animal products increased less than that of crops, in spite of the greater rise in prices, was in the first place due to the tariff systems in Western Europe, which favored imports of crops rather than animal products. The particularly large expansion in areas especially adapted to grain was also a factor. Inadequate elasticity of Russia's agricultural structure may have had a share in the phenomenon. Still, transportation of perishable goods (animal products, fruits, and vegetables) by railway was doubled over the period.[24] Exports of eggs increased 79 percent and those of butter 142 percent from 1901 to 1913. Unfortunately, exports of bran and oilcake also grew by 50 and 90 percent respectively.

Several factors, among them the exhaustion of land suitable for colonization in Asiatic Russia, make it quite doubtful that agricultural output would have continued to expand at the previous rate for any great length of time, even though war had not come and the international markets for farm products had remained as favorable as in the last years before its outbreak.

WORLD WAR I

The Russian countryside was so overpopulated when World War I started that the drafting of huge masses into the Army (almost all draftees came from the villages) failed to have a strong effect on agricultural production for some time. If the official statistics are broadly reliable, cropped plowland declined by 8.5 percent from 1913 to 1917. A substantial portion of the decline was at the expense of large landowners, who experienced difficulties in obtaining labor. Peasant farming continued almost as usual, although a turn from commercial to subsistence farming was noticeable. The acreage in spring

[23] For example, cropped plowland in 50 provinces plus North Caucasus, Siberia, and Steppe krai increased by 14.0 percent from 1901–05 to 1911–15 as against 6.4 percent in 50 provinces only (*Russian Agriculture in the XXth Century*, pp. 106–07).

[24] N. P. Oganovskii in *Economic Review*, May 1926, p. 41. From 1895 to 1913, railway transport of perishable goods tripled in volume.

wheat, for example, declined more than twice as much relatively as total grain acreage between 1913 and 1917.

The impact of war was greatest in the areas around the Black and Azov seas, partly because they lost their former markets abroad and, owing to transportation difficulties, were unable to find others. Another reason was that in peacetime these areas depended to a considerable extent on seasonal labor from the overpopulated central areas. As early as 1916 the cropped plowland of North Caucasus was 23.8 percent below that of 1913.

No significant changes in livestock herds occurred until 1916. The number of hogs may have increased; horses almost certainly declined, while cattle probably remained about the same.[25] The changes in livestock from 1916 to 1917 also appear to have been small.

A rough estimate of the Gosplan put the gross agricultural production in 1917 at 9.72 billion prewar rubles as against 10.51 billion in 1913, a decline of only 7.4 percent.[26] Even 1918 was still a relatively good year, the decline in agricultural production from 1917 having been estimated at only one percent.

It was fortunate that the countryside suffered so little from the war proper. It was thus better able to weather the appalling hardships that followed in the wake of the Revolution and Civil War. Of course, the Civil War would have culminated in starvation on a very large scale in any event. Had the outside war drawn more energy out of the people before the civil conflict started, the latter itself might have been shortened, for starvation would have come sooner to force an earlier termination.

[25] Nothing definite can be said of sheep and goats; see discussion above, pp. 189–90.

[26] B. Gukhman, *op. cit.*, pp. 114–15. The estimates given by him are those of the Gosplan. The values of the output of the whole rural economy in those years, as given by Gukhman, are found in *1st Plan*, I, 15, thus indicating the official nature of Gukhman's data. His figure for 1913, as used here, was adjusted downward for the exceptionally good grain crop of that year.

CHAPTER X

DECLINE AND RECOVERY AFTER THE REVOLUTION

DECLINE

The decline in farm output caused by World War I was dwarfed by the catastrophe of the period of War Communism (Civil War), when the peasants were forced to deliver all their surplus produce for practically worthless money and much was confiscated that was within the permitted minimum. When Nature threw in two successive droughts, in 1920 and 1921, agricultural production was so low that millions died of starvation. Suffering and demoralization reached such extremes that according to numerous reports cannibalism was resorted to. Only the high degree of self-sufficiency of the peasantry saved agriculture from an even worse contraction.

The heavy loss of workers and draft animals which accompanied the disaster naturally caused a further decline in agricultural activity. In 1922 the grain acreage was 32 percent below prewar. Oilseeds, which had shown a strong upward trend before the war, declined less than grain, but sugar-beet production was only at about 20 percent of the prewar level, and cotton growing was virtually discontinued (3.8 percent of prewar in 1922).[1]

From the 1916 census to 1922 the following percentage declines in livestock were reported:[2]

All horses	32.7
Workhorses	35.1
All cattle	24.4
Cows[a]	4.6
Hogs	42.2
Sheep and goats	24.8

[a] The 17.9 percent mentioned in footnote 2 seems nearer the truth.

[1] All comparisons of 1922 with prewar from *1st Plan*, I, 144.

[2] Computed from the data in *Animal Husbandry USSR, 1916–1938*, Gosplan (Moscow, 1940), except for the figure for workhorses, which is from *The Bases of a Tentative Plan for*

In all types of livestock, young animals declined more than adult stock. Young cattle other than calves were reduced by 54 percent from 1916 to 1922. Correspondingly, colts declined by 58.7 percent and one- and two-year-old horses by 50 percent. The particularly heavy reduction in young stock is a reliable indicator of the extreme degree of disorganization. But the fact that adult livestock was maintained somewhat better was beneficial from the standpoint of immediate supply of draft power and animal products. It also permitted a rapid rebuilding of hog herds when the feed situation improved.[3]

The improvement in the composition of farm machinery from 1910 to 1914 and the losses in succeeding years have been mentioned (page 185). An official source, prepared in 1923, concluded that in respect of machinery agriculture was thrown back roughly to the level of 1910.[4] The ill effect of this decline in machinery was greatly intensified by the increase of about 50 percent in the number of individual farms. In 1920, approximately one plowing implement (plow, sokha, or kosulya) and one harrow (usually wooden, and often with wooden teeth) were available for every three peasant households.

Only rough estimates of the gross agricultural production during the War-Communism years could be made. The following tabulation compares such estimates with the prewar figure, in billions of pre–World War I rubles:[5]

Year	Rural economy	Agriculture proper
1913	11.61	10.51
1918	10.62	9.62
1919	8.86	7.86
1920	8.00	7.00
1920–21	7.42	6.42
1921–22	6.31	5.46

Thus, agricultural production in 1921–22 is shown to have been little more than half of the prewar level. While the esti-

the Development of Agriculture and Forestry, Commissariat of Agriculture RSFSR (Moscow, 1924), p. 43. The latter source assumed for cows a decline of 17.9 percent over the same period.

[3] Hog numbers rose from 12.9 million in the summer of 1923 to 22.2 million in the summer of 1924.

[4] *The Bases of a Tentative Plan . . . .*, p. 26.

[5] B. Gukhman, "Development of Production (1913–1928)," *Economic Review*, September 1929, pp. 114–15; the data for the rural economy are also in *1st Plan*, I, 15.

mates for the worst years may be slightly too pessimistic, they suggest the extent of misery suffered by the population. The total gross production of farm products in 1922–23 was estimated at 7.84 billion rubles or 75 percent of prewar,[6] but with normal weather conditions it would have been less than 70 percent. However, even those figures appear favorable in comparison with the corresponding figures for large-scale industry, the output of which, in 1920 and 1922, amounted to only 13.8 and 25.5 percent respectively of the 1913 level.[7]

RECOVERY

According to official computations, gross agricultural production reached the prewar level as early as 1925–26, and exceeded it by 6.0 percent in 1926–27.[8] This was certainly an excellent showing, considering the great decline in the preceding years and the generally unfavorable situation for agriculture during the recovery period.

The rapidity of the recovery was almost entirely the result of the peasants' efforts to cover their own needs in food and cash for the most urgent outlays. An idea of how pressing those needs must have been can be gleaned from the results of a survey made in 1925, after the recovery of acreage had made considerable progress. Of 188,914 households surveyed in the deficit or "consuming" (non-Chernozem) zone, 51.8 percent had 2 desyatiny (5.4 acres) or less in crops other than natural hay, and only 2.3 percent had over 6 desyatiny in crops. In the surplus or "producing" (Chernozem) zone of European Russia, excluding North Caucasus, 55.4 percent of the surveyed households had 4 desyatiny or less in crops.[9]

Technical handicaps, such as shortage of machinery and especially of draft power, were the most serious obstacle to recovery in its early stages, but economic factors played an increasingly important role as the recovery proceeded. The promulgation of the NEP (New Economic Policy) in March 1921 gave the green light to producers. While the agricultural tax

[6] Gukhman, *op. cit.*
[7] *Socialist Construction USSR, 1936*, Gosplan (Moscow, 1936), p. 2.
[8] Gukhman, *op. cit.*
[9] *Statistical Handbook USSR, 1927*, Central Statistical Board (Moscow, 1927), pp. 66–67.

was rather heavy, it was a great improvement over the obligatory delivery of all surpluses in the War-Communism years. Still, the "large producers" were constantly under suspicion. The renting of land and especially the hiring of labor were encouraged only during the short span between 1925 and 1927.

The critical impediment to recovery in its later stages, however, was the unfavorable price relationship between farm and non-farm products. Production for the market, except that involving no outlay other than the farmer's own labor, rarely repaid the costs. Production based on seasonal labor obtained from distant areas, or on similar large outlays, was out of the question. Domestic colonization was so greatly handicapped as to be practically excluded.

There was much dissatisfaction in the USSR over the great slackening in pace of agricultural recovery in the final stage, and the slow progress thereafter. As a matter of fact, the progress which agriculture was able to make under the unfavorable conditions then prevailing was remarkable. Only a largely self-sufficient agriculture could have accomplished it. Enterprises based on hired labor would have failed under such conditions; indeed, most of them would have discontinued production entirely or, more likely, would not have resumed operations after the Civil War had stopped them.

While the rate of improvement in production must be considered satisfactory under the circumstances, marketings necessarily lagged greatly. The true situation in those years is revealed with the greatest clarity in the small deliveries by producers—the principal ground for ultimate compulsory collectivization.

TECHNICAL FACTORS

Labor supply.—The ample labor supply during recovery was the only satisfactory aspect of the agricultural situation. The high birth rate compensated for the huge losses in the war with Germany and Austria, the Civil War, and the starvation of 1921–22. In 1923 the rural population was again at its prewar level, and in 1928 was almost 10 percent higher. But shortage of labor had not been a decisive factor in the agri-

cultural decline, and abundance of labor could not be of great importance in the recovery.

Draft power.—Shortage of draft power was a great handicap. The decline in total draft power (horses and oxen) from 1916 to 1922 was officially estimated at 38.9 percent.[10] The same source estimated that as late as 1927 animal draft power was 13.3 percent short of the 1916 count. The amount of draft power was still below prewar in 1928, even if the probably considerable decline in horse numbers between 1913 and 1916 is disregarded, and the small amount of power in tractors (introduced into the USSR in 1924) is included.

The effect of the shortage of draft power was accentuated by the great increase in the number of households. In 1922, 37.1 percent of all households had no workstock at all, and half had only one animal.[11] The famine-stricken areas were particularly hard hit. In Saratov Province, where the peasants normally had more than an average number of workstock, 44.7 percent of the investigated households possessed only one animal in 1922 and 42.2 percent had none.[12]

Farm machinery.—The supplies of new farm machinery were small at the beginning of the recovery period. In 1922 there was only about 15 percent of the supplies of 1913 when, by Russian standards, they were very large. However, both production and imports of farm machinery expanded rapidly in succeeding years. The 1913 supply was approximately reached in 1925–26.[13] In 1927–28 the total supply of new machinery was almost 50 percent above prewar.[14] Still, the investment in machinery per hectare of cropped plowland was believed by the Gosplan to have been, in 1926–27, at least 20 percent below prewar.[15]

[10] *1st Plan*, I, 144, and *Control Figures of the National Economy USSR, 1929–30*, Gosplan (Moscow, 1930), pp. 440–41, n. 2.

[11] *National Economy USSR in Figures, 1924*, Central Statistical Board (Moscow, 1924), p. 99.

[12] *National Economy USSR in Figures, 1925*, Cent. Stat. Bd. (Moscow, 1925), p. 320.

[13] Production amounted to 84 million rubles (at prewar list prices) in 1925–26 as against 67 million in 1913; 1925–26 imports were valued at 44 million rubles as against 46 million prewar rubles in 1913.

[14] Domestic production reached 154.5 million rubles (at prewar list prices) in that year, but imports declined to 20.8 million current rubles.

[15] N. P. Oganovskii, "Reconstruction of Agriculture and the General Plan," *Socialist Economy*, V, 1927, 2d issue, p. 34.

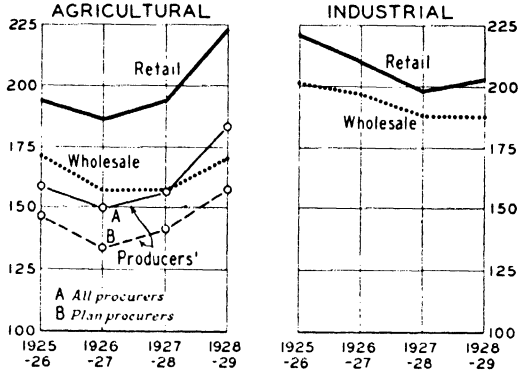
PRICE RELATIONSHIPS

Normal price relationships were not restored during the period of recovery. Moreover, there appeared no tendency toward continued improvement after the initial disorganization was to a certain extent overcome.

Disorganization of trade channels.—The most conspicuous feature of the price situation in those years was that retail prices were farther above their prewar level than wholesale prices were, while prices received by producers had risen the least (Chart 14). In 1925–26 to 1927–28, the combined index of

CHART 14.—PRINCIPAL PRICE INDEXES, ANNUALLY 1925–26 TO 1928–29*

(Prewar bases[a])



* Data in Chart Appendix.

[a] Average of the three good crop-years 1910–11, 1912–13, and 1913–14 = 100 for producers' prices; 1913 = 100 for all others.

agricultural and industrial retail prices on the 1913 base averaged 207, as against 185 for wholesale prices. Industrial goods were 95 percent above prewar prices at wholesale, and 110 percent above at retail. Farmers received only 55 percent more for their products in those years than before the war, while wholesale prices of the same products had risen 62 percent and retail prices were 91 percent above prewar.

These price disparities leave no doubt that several years after the end of the Civil War the exchange of goods was still functioning much more poorly than it had under the Czar, when it had by no means functioned well. Moreover, in the latter part of the period, the gap between the indexes of total retail

and wholesale prices, instead of narrowing, widened from 19 points in 1925–26 to 28 points in 1928–29.

The literature of that time abounds in discussions of the disproportionately high costs of distribution. The excessive marketing costs on exported goods receive particular attention because they were a strong obstacle to regaining foreign markets for Russian products. Oganovskii, for example, emphasized that on exported eggs, for which the producers received 32.22 rubles per box, the marketing costs were equivalent to 25.67 rubles in 1924–25, whereas before the war they had not exceeded 10 rubles.[16] According to the chief economist of the Commissariat for Foreign Trade, marketing costs on exported grain increased from 27.5 kopeks per pood before the war to 62 kopeks in 1925–26, or from 37.1 to 69.6 percent of the procurement price.[17]

The great disorganization of trade channels is also revealed in the fact that there were three different markets—state, co-operative, and private—with three different price levels. The retail indexes shown in Chart 14 and discussed in the text are actually composite indexes obtained by weighting the price indexes of the three separate markets. In the fiscal year 1926–27, for example, the total retail index of 208 is an average of 188 for the state trade, 196 for the co-operative trade, and 235 for the private trade.[18]

As in the case of wholesale and retail prices, the margins between prices in socialized and private trade were widening. In 1925–26, prices in private trade were higher than in the socialized trade by 11 percent, in 1927–28 by 32 percent, and in July–September 1928–29 by 78 percent (see also Chart 15, p. 207).

The "scissors."—Another feature of the price situation at that time, which was of great importance in a country as predominantly agricultural as the Soviet Union, was the great disproportion between the prices of agricultural and industrial goods. This was everybody's concern during the whole recovery

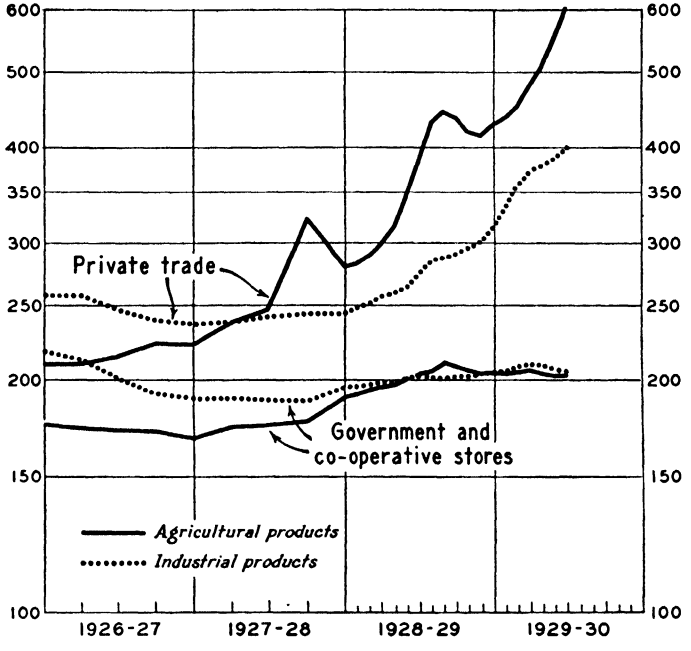
[16] N. P. Oganovskii, "Production and Marketing of Perishable Products," *Economic Review*, May 1926, p. 48.

[17] M. Kaufman, "Foreign Trade," *Economic Review*, December 1926, p. 178.

[18] *Statistical Handbook USSR, 1928*, Central Statistical Board (Moscow, 1929), p. 725.

CHART 15.—RETAIL PRICES OF AGRICULTURAL AND INDUSTRIAL PRODUCTS, OCTOBER 1926 TO APRIL 1930*

(Index numbers: 1913 = 100; logarithmic vertical scale)



* Data in Chart Appendix. The great range of prices in private trade necessitated use of the logarithmic scale.

period. Trotsky even coined a special term for it. They spoke of the "scissors" widening or narrowing, when the spread between the prices of farm and non-farm products increased or declined. The official statistical publications included the "scissors" in their tabulations by expressing the price indexes of industrial goods on the pre–World War I base as percentages of the corresponding indexes of farm-product prices. But little was done to remedy the evil—indeed, little could have been done under the prevailing conditions. When it finally became certain that the price disproportions between farm and non-farm products could not be eliminated, an attempt was made to find a form of farm organization that would function effectively in spite of unfavorable price relationships. Compulsory collectivization was expected to accomplish this miracle, but it failed.

The discrepancy between the two groups of prices was large

right from the start of the recovery period. In October 1922 the "scissors" in wholesale prices stood at 139.0 (that is, the index of wholesale prices of industrial goods was 39 percent above the index of wholesale prices of farm products). The disparity increased by leaps and bounds until, in September 1923, industrial goods were more than three times as expensive, relatively, as farm products in wholesale markets. The 1924 crop was a failure, and by the beginning of 1925 the discrepancy between the farm and non-farm prices in the wholesale market had been wiped out entirely, but it was soon restored. In later years the price relationships appear to have been more or less stabilized, with industrial goods tending to be 10 to 25 percent more expensive relatively than farm products at wholesale.

But the true situation was much worse than this. The producers of farm products, while buying at the high retail prices, did not receive for their produce even the relatively low wholesale prices. The index of retail prices of industrial goods (based on 1913) stood at 210 in 1926–27, the index of producers' prices of farm products at 149 (Chart 14, p. 205). Thus the "scissors" between these two indexes was 141, rather than 125, the "scissors" shown by the wholesale farm and non-farm price indexes of that year.[19]

Furthermore, the great increase in all kinds of trade margins, and the inability of the trade channels to function efficiently in the emergency, brought about a great increase in the margins between farm prices in the surplus and deficit areas. As shown by the data in Table 15 a peasant in the Volga region, delivering rye to the state or to co-operatives in 1928–29, received only about 10 percent more than the prewar price. If, however, he could transport his rye to a city market he would get about 80 percent more than the prewar price. Before World War I, traders who bought rye in surplus markets and brought it to Leningrad oblast worked on a margin of 2.5 rubles per quintal.

[19] Russian economists of that period did not fail to notice these abnormalities. Indeed, *Economic Review* periodically published computations of the quantities of rye and wheat which the producers would have to give in exchange for textiles, salt, kerosene, soap, boots, nails, and so on (see, for example, the issues for May and November 1926). Similar computations were made by the Institute of Business Research, directed by N. D. Kondratiev These computations were widely utilized by other economists, especially M. Kaufman, previously cited.

The same margin was 20 rubles in 1928–29.[20] The steppe portion of the Ukraine before the war had the same rye price as the Middle and Lower Volga regions; in 1928–29 the market price in the Ukraine steppe was 75 percent higher than in the Volga regions.

TABLE 15.—RYE PRICES TO PRODUCERS IN SPECIFIED PERIODS

(Rubles per quintal)

Region	Pre-World War I[a]		1928–29[b]	1928[c]
	1911–13 average	1913		
Leningrad oblast	7.3	7.3	...	28.2
Industrial region	5.9	5.7	...	23.0
White Russia	5.3	5.1	...	19.1
Ukraine	4.9[d]	4.5[d]	5.8[e]	14.4[f]
Middle Volga	5.0	4.1	5.5	8.8
Lower Volga	5.0	4.0	5.5	7.7

[a] Prices officially designated as local prices from *Recueil de Données Statistiques et Économiques sur l'Industrie Agricole en Russie et dans les Pays Étrangers*, IX, Russian Ministry of Agriculture (Petrograd, 1916), pp. 472 and 476.

[b] Procurement prices, from *National Economy USSR: Statistical Handbook 1932*, Central Office of National-Economic Accounting (Moscow, 1932), p. 352.

[c] July–September prices in peasants' markets in cities and towns, from *Statistical Handbook USSR, 1928*, pp. 734–35.

[d] Novorossiisky krai only.

[e] Crimea only.

[f] Steppe portion only.

Correspondingly, the price indexes of farm products in the food-surplus areas were below the national average, but the indexes of industrial goods were higher. In October 1926, for example, the retail prices were as follows:[21]

Item	USSR	Ukraine and Crimea
All products	214	203
Agricultural products	191	171
Industrial products	230	231

In the Ukraine and Crimea in October 1926, textiles retailed at 172 percent above the 1913 price (composite index; in private trade they were 225 percent above prewar), while producers of farm products were getting a scant 20 percent in excess of prewar prices for their produce. Hence, the "scissors"

[20] The great inter-regional margins as well as the wild changes in grain prices from year to year are discussed by V. Shekhanov, "An Appraisal of the First Half of the Current Crop Year," *Economic Review*, February 1926, pp. 120–22.

[21] *Statistical Handbook USSR, 1928*, pp. 725, 730.

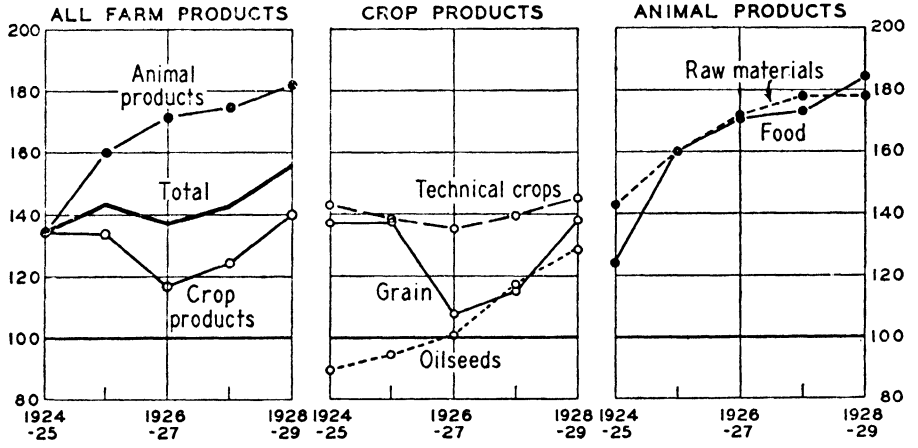
with reference to textiles was equivalent to more than 200 against the Ukrainian peasant.

To find price relationships as unfavorable for agriculture as they were in the last years of postwar recovery, it would be necessary to go back to times when no price statistics were available. The price situation was certainly less satisfactory for Russian agriculture in the 1920's than in the 1880's and 1890's when it was prostrated by unfavorable prices.[22]

Individual farm products.—The prices of individual farm products also displayed very great disparities (see Chart 16).

CHART 16.—PRODUCERS' PRICES OF FARM PRODUCTS, ANNUALLY 1924–25 TO 1928–29*

(*Index numbers: 1909–13 average = 100*)



* Data in Chart Appendix. Note that these indexes differ in base and other respects from the producer-price indexes in Chart 14.

Bread was the staff of life in Russia, and the whole economy tended to adjust itself to the prices of bread and grain. It became therefore an acknowledged policy during World War I to keep grain prices low in the hope that prices of other products would be automatically held in some reasonable proportion to grain prices, and that the inflation of currency would thus be slowed down. The policy was obviously based on the fact that most

[22] A very strong indication of the unsatisfactory conditions in agriculture is the fact that wages for farm labor were far below prewar, when the decline in purchasing power of the money is considered; see V. P. Timoshenko, *Agricultural Russia and the Wheat Problem* (Stanford University, Calif., 1932), pp. 246–47. As Timoshenko correctly remarks, there was no distinct demarcation line between farm laborer and peasant in either Russia or the USSR. The very low earnings of farm labor reflected a situation common to all the peasantry.

grain producers, being of the self-sufficing type, would go on producing grain however unfavorable its price relationship to other products. The policy would naturally have been more effective when applied to rye, produced chiefly by the peasants for themselves, than to wheat and barley, which were more largely produced for the market. The present writer was in favor of the policy during that war and still believes that it was wise, but for a short time only. Continued over years, it inevitably failed. Indeed, it led to catastrophe.

In the period covered by Chart 16, 1924–25 was the only year in which grain prices were not lower than the average of all producers' prices relative to prewar levels. In 1926–27 and 1927–28 they were respectively 28.9 and 27.8 points below the average. The only important farm product that was relatively cheaper than grain was oilseeds, prices of which in some years were below the prewar level.[23] Technical crops other than oilseeds, mainly fibers and sugar beets, also were low in price. But the prices of sugar beets, and of cotton especially, are not indicative of the profitableness of producing those crops, owing to certain special advantages granted to the producers. Sugar-beet growers, for example, had their agricultural tax reduced. Moreover, while the prices paid to the producers for sugar beets were low, they compared favorably with those for grain. Cotton growers received grain at prices comparable with the prices paid to them for cotton, and had other important help, such as maintenance of the irrigation system and deliveries of commercial fertilizer at favorable prices.[24]

The prices received by farmers for animal products were high in relation to the prices of vegetable products. As to individual commodities, very erratic conditions prevailed. The purchasing agencies exploited their monopoly in paying low prices for butter, most of which was procured in distant areas, especially Siberia. Prices of large hides, for which the peasants had no use, were kept low, while prices were high on small hides. Meat prices in general were relatively high.

[23] Sunflower oil was still a new product that had to create a market for itself through low prices.

[24] R. Belotserkovsky, "The Price Policies with Reference to Agricultural Raw Materials," *Economic Review*, January 1929, pp. 49–50.

The variations in prices paid to producers were reflected in the prices paid by consumers in retail markets, with the addition of the excessive marketing margins of that time. While the producers received little more for their oilseeds than before the war, the retail-price index of vegetable oil stood at 185 in 1926 and at 193 in 1927.

Meat was among the most expensive farm products in the retail markets, yet at Moscow, the largest consuming center of the Union, the average meat price was relatively lower than the combined index of all industrial products (Table 16).

TABLE 16.—RETAIL PRICE INDEXES IN DIFFERENT-TYPE MARKETS IN MOSCOW, 1926 AND 1927*

(*Average price in 1913 = 100*)

Commodities	1926				1927			
	Average	Market			Average	Market		
		State	Co-operative	Private		State	Co-operative	Private
Grain and grain products	175	152	154	209	182	144	154	231
Meats	212	205	209	218	202	202	206	198
Textiles	252	242	241	274	237	215	218	282
Metals	192	141	209	226	181	141	188	213
All farm products	189	172	172	213	192	167	172	223
All industrial goods	224	204	218	248	209	186	197	248
All commodities	209	191	198	234	202	178	186	238

* Data from *Statistical Handbook USSR, 1928*, p. 729.

The climax.—The years 1928 and 1929 were a period of transition. The NEP was dead. A strengthening of the attack on the kulaki was demanded by a resolution of the XVth Party Congress in December 1927, but the transition to collective farming had still to be only gradual. On July 12, 1928, Stalin warned against raskulachivanie (liquidation of kulaki).[25] "Liquidation of the kulaki as a class" did not become the battle cry until the end of 1929.[26] For the last time an attempt was made to reach some balance by free-economy means, such as an increase in the procurement price of grain (by 9 percent for the crop year 1928–29), increased supplies of consumer goods in

[25] Joseph Stalin, *Problems of Leninism* (9th ed., Moscow, 1934), p. 328.
[26] *Ibid.*, p. 458. Stalin's speech on Dec. 27, 1929.

villages, and restoration of closed markets. But the mixture of compulsion with free economy could not work. The price indexes reflected this failure as unmistakably as a mirror.

The wholesale and retail prices of farm products in the socialized trade sector increased moderately, about as much as the procurement prices. But the retail prices of those products in private trade were already soaring by leaps and bounds. After having risen in 1927–28 by 19.5 percent, they made a further jump of 48 percent in 1928–29. From October 1929 to April 1930 the index of retail prices of farm products, as computed by the Central Statistical Board increased another 42 percent to stand in the latter month at exactly six times the prewar figure (Chart 15, p. 207). One response to this catastrophe was the discontinuation of the publication of price statistics.[27]

PRODUCTION

According to the Gosplan, the following percentage changes occurred in the most important production factors from 1913 to 1927–28:[28]

Crop area		Livestock numbers		Volume of production	
Total cropped plowland	− 1.4	All horses	−13.8	Grain	− 9.8[b]
Grain	− 5.4	Workhorses	−17.6	Potatoes	+38.8
Technical crops	+31.2	All cattle	+ 9.5	Cotton	− 3.4
Cotton	+ 7.3	Cows	+12.7	Flax	−35.7
Sugar beets	+ 6.9	Sheep and goats	+ 8.3	Sugar beets	− 7.3
Flax	− 9.7[a]	Hogs	+10.3	Oilseeds	+31.1
Oilseeds	+38.0	Total in terms of adult cattle		Dairy products	+17.4[c]
Other crops	+24.7	All animals	0.0	Eggs	−23.1[c]
		Workstock	−14.2		

[a] A later revision by the Gosplan (*Socialist Construction USSR, 1936*, p. 280) indicates an *increase* from 1913 to 1927 of 13.1 percent for all flax and 18.6 percent for fiber-flax.

[b] Because the 1913 grain crop was exceptionally good, the 1927 crop is here related to the 1909–14 average.

[c] Later revisions of the 1927–28 production figures for milk and eggs (less milk and more eggs; see Nifontov, *Animal Husbandry of the USSR in Figures*, Moscow, 1932, pp. 156–57) are disregarded here, because the Gosplan might have wanted to adjust its 1913 figures to the revised figures for 1927–28.

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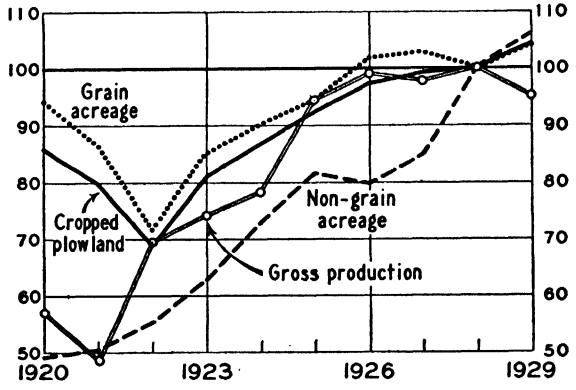
[27] *Economic Review*, the journal from which most of the price data here presented were obtained, had been merged with *Planned Economy* after the April 1930 issue, that is, in the midst of the subscription year. Moreover, *Planned Economy* did not take over the statistical appendix found at the end of each issue of the *Economic Review*. The merger actually meant discontinuation of the latter.

[28] *Control Figures of the National Economy USSR for 1928–29*, Gosplan (Moscow, 1929), p. 412.

All these and some other factors add up to an increase in gross production of 4.5 percent from 1913 to 1927–28, according to the Gosplan. Postwar trends in gross production, crop acreages, and livestock numbers are shown in Charts 17 and 18.

CHART 17.—GROSS AGRICULTURAL PRODUCTION AND SPECIFIED CROP ACREAGES, 1920–29*

(Index numbers: 1928 = 100)



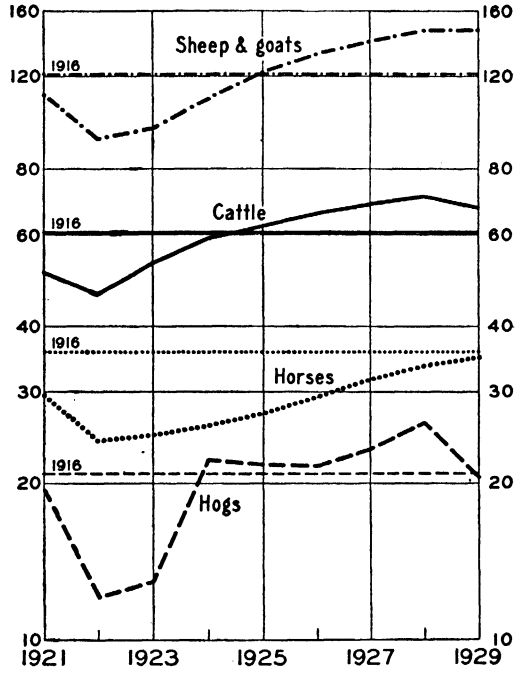
* Based on data in Chart Appendix, which gives data in absolute terms and covers individual crop areas. See also data for Chart 19.

Acreages.—Total cropped plowland almost reached the prewar level in 1927, according to the figures above. While the non-grain acreage showed a substantial increase, grain lagged behind the total. The failure of the total grain acreage to reach the prewar level may have been due in part to the particularly great shortage of draft power in certain areas concentrating on grain. The unsatisfactory prices, however, provided the principal damper. The predominance of grain was little affected by the change to non-grain crops. Grain still occupied 84.3 percent of all cropped plowland in 1927, as against 87.9 in 1913.

The largest increases in non-grain crops were in potatoes and oilseeds. The marked increase in potato output probably represented the resort by farmers to a food crop not subject to compulsory deliveries. But the continued departure from the three-field rotation was certainly the major factor in the expansion. Even small-scale peasant farming was displaying a certain amount of elasticity. Another even stronger indication of it is the fact that sugar-beet acreages exceeded the prewar level, al-

though before the war almost all sugar beets had been grown on large estates and sugar-beet production was virtually wiped out by the Revolution. The Gosplan explained the rapid expan-

CHART 18.—LIVESTOCK NUMBERS, 1916 AND 1921–29*
(Million head; logarithmic vertical scale)



* Data in Chart Appendix.

sion of the sugar-beet acreage by the favorable price relationship to grain.[29]

The moderate increase in flax acreage over the prewar level was caused by favorable prices in the early years of recovery. As a result of the decline in flax prices in 1925–26, the principal producing areas curtailed both their acreage and the proportion of flax marketed.[30]

There were noteworthy developments in the distribution of the grain acreage among individual grains. The area in corn tripled between 1913 and 1927, but the wheat acreage in the

[29] *Control Figures . . . . for 1928–29*, p. 232.

[30] See R. Belotserkovsky, *op. cit.*, pp. 44–45, and M. Mikhailov, "The Production of Agricultural Raw-Materials," *Economic Review*, January 1929, p. 151.

latter year was still considerably below the prewar level. The strongest indication that all was not yet right on farms by 1927 was the fact that the millet crop of that year was about 50 percent above prewar. The extent of millet cultivation in Russia is a reliable indicator of prosperity or starvation. When conditions are poor, especially when draft power is scarce or greatly weakened by feed shortage, the farmers in climatically suitable areas resort to millet, a crop sown late in the spring and requiring little seed. The shift to this low-yielding crop offers the advantage that at the moment less edible stuff need be taken out of the mouths of one's children, while the later sowing leaves more time for the preparation of the land. From 3.7 percent of the total grain acreage in 1913, the millet acreage jumped to around 10 percent in 1922, and accounted for 6.2 percent as late as 1928.

Hay was omitted from the tabulation above because no usable data on natural-hay acreages or production in 1913 are available. Since hay was mowed mostly by hand, the shortage of draft power was less of a handicap to harvesting natural hay than to the cultivation of crops. It seems probable, therefore, that more meadows were mowed in 1928 than before the war. The acreage in natural hay may have reached the prewar level as early as 1926, when it was 3.8 percent below that of 1928.[31] The possibility that hay was relatively abundant may account wholly or largely for the rapid recovery of such productive livestock as was fed mainly on roughage.

Yields per acre.—It is not surprising that yields of most crops failed to return fully to prewar levels, in view of the breaking up of big estates and large peasant holdings,[32] and especially the increase in strip farming. The shortage of draft power and machinery was also a serious obstacle to improved yields. But the statistics cannot be relied upon to reflect minor differences correctly. The Gosplan took eight quintals per hectare of grain as the level for both 1927 and 1913. Sunflower seed also yielded at about the prewar level in 1927, but the yield of cotton and,

[31] *Statistical Handbook USSR, 1928*, p. 218.

[32] The Gosplan emphasized the effect of parcelling in reducing yields even of flax, which, more than most others, is a small-producer's crop. See *Control Figures . . . . for 1928–29*, p. 232.

especially, of sugar beets and flax, lagged considerably (see Table 43, p. 507). The low yield of sugar beets was most natural because the shift from large to small producing units was greatest in this crop, and many of the new producers were unfamiliar with its cultivation. The result with sugar-beet growing by the peasants was very satisfactory in spite of the low yields they obtained.

Livestock.—The considerably better recovery made by productive livestock than by workstock (see p. 213 and Chart 18) was due in part to the fact that farm horses normally increase more slowly than other livestock. But the relatively favorable prices of animal products as compared with grain were also important.[33]

Increased numbers of productive livestock naturally led to increased production of animal products. Milk output in 1927–28 was estimated by the Gosplan at almost 20 percent above prewar, and it is probable that more meat was produced in 1927–28 than before the war. Only egg production lagged seriously, but the increase of 23.4 percent between 1925–26 and 1927–28 was encouraging.

Per capita production.—The population in 1927–28 exceeded that of 1913 by 7.6 percent. Hence, on a per capita basis, prewar production was not yet fully restored by 1927–28. The importance of the growth in population was fully realized by the Gosplan, which published the following computation of percentage changes in various production factors from 1913 to 1927–28, on a per capita basis:[34]

Production factor	Percentage change
Cropped plowland	− 9.5
Grain area	−12.2
Crop production	
Grain	−16.2
Cotton	−10.0
Flax	−39.4
Sugar beets	−13.8
Oilseeds	+23.3

[33] See the discussion in *Control Figures . . . . for 1928–29*, pp. 221 and 226. The Gosplan even assumed a substantial increase in the rates of feeding to productive livestock in 1926–27 and 1927–28, but this assumption was not supported by other evidence (see page 752, n. 7).

[34] *Ibid.*, p. 413.

Production factor	Percentage change
Animal numbers in terms of adult cattle	
All livestock	− 8.2
Productive livestock	+ 2.9
Animal products, output	
Milk and milk products	+ 9.1
Eggs	−28.6

The same computation for the rural population would have yielded similar results. These computations are the more significant because, soon after their publication, Soviet officials displayed an obvious inclination to forget that the rural population had increased and consequently needed more food.

Regional aspect.—The degree to which prewar production levels were restored varied widely with regions. Siberia, generally an expanding area, had suffered least from the Civil War and was not sorely afflicted by the 1921 drought. Agricultural production there was far above prewar levels in 1928. Middle and Lower Volga, on the other hand, were the centers of the 1921 disaster. In the North Caucasian krai, which at that time included the former oblast of the Don Cossacks, the resistance of the Cossacks to the Soviet government retarded recovery to a marked degree. All those areas were far below prewar levels of agricultural output in 1928. The data for 1928, in percent of 1913 for acreages and of 1916 for livestock, show the situation.[35]

Item	Siberia	Middle Volga	Lower Volga	North Caucasus
Cropped plowland (1913 base)				
Total	132.6	89.1	74.0	78.9
Grain	131.1	86.5	70.1	70.3
Livestock numbers (1916 base)				
Horses	103.4	71.4	58.8	69.9
Cattle	127.8	103.9	109.9	118.4
Hogs	133.6	63.9	93.6	73.3
Sheep	163.7	92.5	95.4	106.6

Agricultural production in the densely populated food-deficit areas of northern and central European Russia was about 10 percent above prewar in 1928.

[35] *Control Figures . . . . for 1928–29*, pp. 576–78. The figures for acreages in Siberia are uncertain.

The Tentative Plan.—The Tentative Plan, prepared in the winter of 1923–24 and extensively utilized in this study, was essentially a forecast of the probable situation in 1928–29.[36] Its projections were related to actual conditions in 1913 (1916 for livestock) and 1923–24. Although the three succeeding plans, here referred to as 1st, 2d, and 3d, were prepared in much greater detail and were not qualified as tentative in the titles under which they were published,[37] the Tentative Plan was the only one which was by and large fulfilled, so far as concerns agriculture (Table 17). In appraising its forecasts, one must bear in mind that certain figures for 1913 and 1923–24 were later revised, and that on the basis of these revisions the authors' anticipations might have been different for 1928–29.

TABLE 17.—TENTATIVELY PLANNED AND ACTUAL CHANGES IN AGRICULTURAL PRODUCTION FROM PREWAR AND 1923 TO 1928*

(*Percent*)

Item	Pre-war[a] to 1928		1923 to 1928	
	Planned	Actual	Planned	Actual
Gross production	+ 3.5	+10.0[b]	+ 48.2	+ 34.3[b]
Cropped plowland				
Total	+ 0.8	− 3.2	+ 36.7	+ 23.1
Grain	− 5.6	− 8.3	+ 32.0	+ 23.1
Fibers[c]	+11.6	+32.3	+ 81.2	+ 84.2
Sugar beets	−25.0	+18.7	+100.0	+190.0
Livestock				
Horses	−21.7	− 6.4	+ 22.4	+ 36.3
Cattle	+ 3.8	+16.3	+ 35.5	+ 33.3
Cows	+ 6.7	+18.1	+ 18.3	+ 17.6
Hogs	+ 2.0	+24.4	+118.7	+101.6
Sheep and goats	−10.7	+21.0	+ 33.6	+ 54.0

* Planned changes are from *Bases of a Tentative Plan . . . .*, pp. 41–43, and 46. Actual changes were computed from various official sources, mainly *Cropped Plowland USSR, 1938*, Gosplan (Moscow, 1939) and *Animal Husbandry USSR, 1916 to 1938*, Gosplan (Moscow, 1940). The total cropped plowland and grain acreage of 1913 used in the computations are those given in the *1st Plan*, I, 144. Later revisions indicating smaller acreages in 1913 than in 1928 are disregarded (see p. 728).

[a] Average 1910–15 for gross production, 1913 for cropped plowland, and 1916 for livestock.

[b] Gukhman's figures were used (see Chart 17, p. 214). Gross production in 1910–15 was assumed to have been about 4 percent below 1913. Gross production in 1928–29 was assumed to have been 2½ percent above that of 1927–28.

[c] Including oil-flax.

[36] *The Bases of a Tentative Plan of Development of Agriculture and Forestry*, Commissariat of Agriculture RSFSR, Works of the Zemplan No. 5 (Moscow, 1924).

[37] The 1st Plan was referred to as tentative in its introduction but not in the title.

Considering statistical uncertainties, the data in Table 17 show a reasonably close agreement between expected and actual increases in the value of gross agricultural output. The total acreages and grain acreages planned for 1928–29 on the basis of 1913 levels were likewise closely approximated. The principal discrepancy was in sugar beets, the actual increase over 1923 being almost double the expected one. The relatively favorable conditions for the production of sugar beets (as compared with conditions for grain) which caused this large expansion could not have been foreseen. But it is also probable that the peasants turned out to be more eager to take advantage of a favorable market situation than the planners—who certainly had a great deal of sympathy for them—dared to hope.

Table 17 indicates that the acreage in fibers increased from 1923 to 1928 almost exactly to the extent expected in the Tentative Plan, but the Plan had used a low figure for the 1923 area. The actual increase from 1923 to 1928 was larger than planned, as was the increase from 1913 to 1928. Livestock herds increased over 1913 (but not over 1923) by more than the Tentative Plan foresaw. The planners cannot be blamed for not anticipating the stimulus from the very low grain prices.

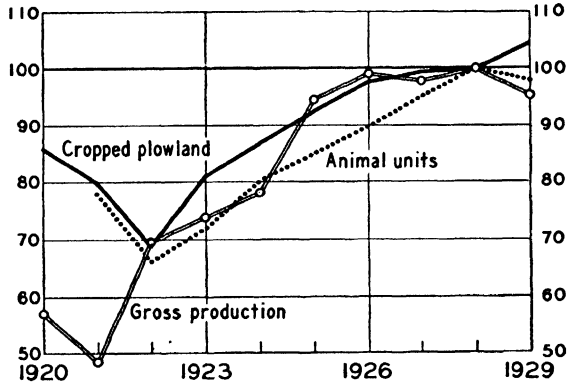
The slowdown.—Gross agricultural production increased by 41 percent from 1922–23 to 1927–28, according to the Gosplan —certainly a very good showing considering the extremely unfavorable market situation and the great changes in land ownership and farm organization. It is of the utmost importance that most of the increase occurred in the first three years, from 1922–23 to 1925–26. Gross production rose 5.2 percent in the next year, but a small decline occurred during 1927–28, and the recovery in 1928–29 was sufficient to raise the level only slightly above that of 1926–27 (Chart 19).

A considerable slowdown in the rate of advance was natural after the worst of the decline had been made good. Moreover, favorable growing seasons were partly responsible for good showings in 1925 and 1926. The yield of grain was estimated at 8.3 and 8.2 quintals per hectare in 1925 and 1926, as against 7.5 and 7.7 quintals in 1927 and 1928. The decline in grain acreage in 1928 was the result of extensive winterkilling. With

the draft-power situation as poor as it was, the loss could not have been fully made up by additional sowings of spring grain. The fact remains, nevertheless, that progress was slow after 1926–27, and there were no reasonable hopes for a speedup in the near future. The slow progress in those years is clearly reflected in the acreage and livestock figures shown in Chart 19.

CHART 19.—CROPPED PLOWLAND, ANIMAL UNITS, AND GROSS AGRICULTURAL PRODUCTION, 1921–29*

(Index numbers: 1928 = 100)



* Data in Chart Appendix.

In 1927, and especially 1928, the government became seriously alarmed, for this situation endangered the program of rapid industrialization and urbanization that was so urgently pursued. The Gosplan wrote in 1928:

> The lag in grain production attracts general attention and the problem of increased grain production is being discussed seriously in the whole country. The difficult situation with reference to productive livestock, especially its most important sector, dairy cattle, is realized much less. . . . . The number of cows increased during the past two years only by 1.5 percent per year, i.e., the increase falls short of the population growth.[38]

The Gosplan went on to say that the number of cows actually declined in areas with large marketings of dairy products.

The situation was so strained that the Gosplan felt it advisable to warn against regarding the described developments as a deterioration of agriculture.[39] It blamed the slow increase in grain acreages upon low grain prices, the shortcomings of the agriculture tax, and the "distortions" that took place in the spring of

[38] *Control Figures . . . . for 1928–29*, p. 233. [39] *Ibid.*, p. 217.

1928 in connection with the "extraordinary measures" (the compulsory grain collections, of which more will be said below). The Gosplan hoped against hope to remedy the grain situation by an increase of 13.5 percent in procurement prices,[40] and anticipated as a matter of course that the "extraordinary measures" would not be repeated. Defects in the agricultural tax were also found by the Gosplan to have been partly responsible for interrupting the increase in productive livestock.[41] Other reasons, mostly minor, were adduced to explain unsatisfactory developments in certain other phases of production, and remedies were suggested. But fundamentally everything would have remained unchanged even if all the recommendations and expectations of the Gosplan had been fulfilled. The "extraordinary measures" were not only repeated next year but were made the standard practice in grain procurements.

With the policies then pursued, only very small increases, if any, in production by private producers were in prospect. The small peasants lacked the needed means of production; for the most part they were also short on ability and initiative. Yet these poorly equipped, backward peasants were the only agricultural producers the regime would tolerate. It did not want to permit the existence of those very producers without whom the cities could not be provided with food nor industry supplied with raw materials. In his speech in April 1929, Stalin said:

> It is true that the kulaki are reducing their sowings . . . . The Party is "possibly" guilty of this policy, which is directed toward support of the poor and average peasants *against* the kulaki.[42]

Moreover, even if the regime could sanction a wealthier and more progressive peasantry, it could not ensure the price relationships sufficient to make expansion of commercial agriculture profitable.

MARKETINGS AND PEASANT CONSUMPTION

The disproportion between the anticipated and actual development of agriculture was most strongly revealed in marketings. The whole problem indeed focused on these. With the produc-

[40] *Control Figures . . . . for 1928–29*, p. 279. [41] *Ibid.*, p. 234.

[42] Stalin, *op. cit.*, p. 425. See also chapter viii of this study for discussion of the operational factors that put a peasant in the kulak class. They were unbelievably small.

tion of grain, the Russian's staff of life, below the prewar level even in the later years of the recovery period, with the rural population larger than ever before, and with prices of farm products far out of line with those of manufactured goods, there was not the slightest reason to expect marketings of farm products to reach prewar magnitudes (Table 18). Yet, surprising as it may

TABLE 18.—MARKETINGS OF FARM PRODUCTS, 1913 AND 1927–28*

(Thousand tons, except as noted)

Commodity	1913	1927–28
Foodstuffs		
Grain	21,310	8,080
Oilseeds	420[a]	2,290
Sugar beets	10,850	9,760
Potatoes	4,730	2,690
Vegetables	....	4,960
Milk and milk products	5,810	5,160
Butter	142[c]	206[d]
Meat (including fat)	1,420	1,350
Poultry	....	110
Eggs (million)	6,700[b]	3,900
Raw materials		
Cotton	738	690
Flax	246	120
Tobacco	28	39
Makhorka[e]	....	120
Wool	72	57
Hides, large (thousand)	....	12,300
Hides, small (thousand)	....	31,700

* Except as noted, data for 1913 from *Socialist Agriculture USSR, 1938*, p. 89, and for 1927–28 from *1st Plan*, II, Part 1, p. 332.

[a] Sunflower seed only, but even for sunflower seed the figure seems rather small. Russia exported 735,000 tons of oilcake in 1913 and a large part of it was sunflower cake.

[b] Exports amounted to 3,570 million; consumption by the urban population estimated, possibly too high, at 125 eggs per capita.

[c] *The Bases of a Tentative Plan . . . .*, p. 41.

[d] *Statistical Handbook USSR, 1928*, pp. 268–69.

[e] A low type of tobacco.

seem, Soviet officials acted as if they expected the peasants to market on the same scale as before the war.[43] When the voluntary marketings failed to cover the needs of the urban population and provide moderate exports, compulsory procurements were instituted. These took the form of an organized attack on

[43] See, for example, Stalin's speech on May 28, 1928 in *ibid.*, pp. 315 ff.

well-to-do peasants. When this attack further disorganized the whole economic setup, the mass collectivization of peasant farming, with the "liquidation of the kulaki as a class," was decided upon and carried through.

Marketings.—Total marketings by the rural population (excluding intra-village trade) in 1927–28 were estimated by the Gosplan at 2.9 billion 1926–27 rubles.[44] According to Oganovskii, marketings per capita of rural population declined 32 percent from 1913 to 1926–27, assuming average crops.[45] This implies a decline in total marketings by about 25 percent.

With oilseeds the only important exception, marketings of all products showed cuts of varying magnitudes over that period. The outstanding decline in grain marketings from 21 million to 8 million tons,[46] represented a real catastrophe.

The accompanying tabulation[47] shows that government procurements of grain increased rapidly after 1924–25. But they could not keep pace with the requirements of the government, which needed ever larger quantities for the urban population, producers of technical crops, and forest workers, and also for export. Moreover, total marketings did not increase as rapidly as government procurements.

Year	Thousand tons	Year	Thousand tons
1916–17	8,323	1922–23	5,916
1917–18	1,202	1923–24	6,842
1918–19	1,768	1924–25	5,248
1919–20	3,480	1925–26	8,913
1920–21	6,012	1926–27	11,616
1921–22	3,814	1927–28	10,993

Instead of becoming easier as recovery proceeded, the task of procuring the needed quantities of grain grew increasingly difficult. The peasants were reluctant enough to part with their grain even at the relatively high prices paid by private traders, yet the government insisted on deliveries to procurement agencies

[44] *1st Plan*, II, Part 1, p. 326.

[45] N. P. Oganovskii in *Socialist Economy*, Vol. V, 1927, 2d issue, p. 38.

[46] Data for 1913 from *Socialist Agriculture USSR, 1938*, p. 89; data for 1927–28 from *1st Plan*, II, Part 1, p. 332.

[47] *Statistical Handbook USSR, 1928*, pp. 702–03; the figure for 1917–18 is from *Ten Years of Soviet Power in Figures, 1917–1927* [English], Central Statistical Board (Moscow, 1927), p. 379. Plan organizations included co-operatives buying for the government.

at even lower prices. The inevitable impasse was reached and the government applied its "extraordinary measures." In his speech in April 1929, Stalin said:

> Through samotek [normal or natural flow] we are able to procure about 300–350 million poods [5.0 to 5.8 million tons]. The residual 150 million [2.5 million tons] have to be taken through organized pressure on the kulak and well-to-do groups of the village. This is the result of the experience with grain procurements during the past two years.[48]

Two paragraphs later, Stalin said with great emphasis: "The grain procurements have to be *organized*" (Stalin's italics). Everybody knew what "organized" meant. In the program that Stalin outlined for the Party earlier in the same speech he stated:

> With reference to the difficulties with grain procurements, it is necessary to approve that temporary extraordinary measures be permissible, measures strengthened by the support of the masses of poor and average peasants—as one of the means to break the resistance of the kulaki and obtain from them the maximum quantity of grain surpluses . . . . and save the foreign exchange for the development of industry.[49]

Those Party members who were in favor of limiting grain procurements to "samotek"—who were, in other words, against the extraordinary measures and advocated grain imports in case of emergencies, even at the expense of reduced imports of machinery for industry—were declared traitors.

The Gosplan's appraisal of the effects of the extraordinary procurement measures in the spring of 1928,[50] its apprehension over the future development of grain production, and its futile hopes that the extraordinary measures would not be repeated, have already been mentioned (pp. 221–22). Producers responded to the extraordinary measures by displaying no inclination to increase production, and prices soared in private markets (see p. 213).

In the marketings of products other than grain, the great declines in flax and eggs were particularly conspicuous.

[48] Stalin, *op. cit.*, p. 426. The distinction between kulaki and well-to-do was made advisedly by the speaker. The well-to-do were poorer than the kulaki. See chapter viii on the "class" distinctions within the peasantry.

[49] *Ibid.*, p. 411.

[50] The Gosplan spoke cautiously of "the excesses of the extraordinary measures," but it meant the measures themselves.

Peasant consumption.—One of the outstanding contradictions in Bolshevik assertions, so characteristic of the regime, was that of crediting the Revolution with a considerable improvement in the peasants' consumption of their own produce,[51] while blaming them for failing to provide the urban population with food and urban industry with raw materials. On the other hand, large marketings were proclaimed an inherent advantage of collectivized agriculture.[52] The decline in grain marketings from 21 million tons in 1913 to 8 million in 1927–28 and their later rise to almost 40 million was the favorite illustration.[53]

The small marketings of the peasants in post-Revolution years could have been the result of inadequate production, heavy consumption by producers, or both. Official complaints about the small marketings imply that the peasants feasted while the city dwellers starved. This is not true. The following analysis indicates that the increase in utilization by the peasants for all purposes—food, feed, and the accumulation of stocks—in that period as compared with pre–World War I was small, and that the reason for the increase is to be found, not in the advantages the peasants had from the Revolution, but in the disadvantageous price relationships that developed between farm and non-farm products in post-Revolution years. The proclaiming of the alleged vast increase in the peasants' consumption of their own products as a success of the Revolution was nothing short of making a virtue of necessity.

In poor countries, the mass of the peasantry buys only things of prime necessity even in good times. This leads some people to believe that price disproportions between farm and non-farm products do not affect the peasants' production and consumption. There are, however, very few things that such peasants will buy regardless of price. They will not do without salt, but they will greatly economize even on it. They will, however, make wooden

[51] On May 28, 1928 Stalin declared: "Small and average peasants have freed themselves fully from the oppression of the large land owners, and by basically undermining the power of the kulaki, have been enabled to improve their material situation. This is the result of the October Revolution." Stalin, *op. cit.*, p. 318.

[52] In his report to the XVIIIth Party Congress in March 1939 (*Problems of Leninism*, 11th ed., Moscow, 1947, p. 538) Stalin proclaimed: "Large marketings of the sovkhoz-kolkhoz production are consequently its most important feature."

[53] Those figures are not fully comparable, although officially they are so used (see general footnote to Table 3, p. 79).

nails when iron nails become too expensive, and they may return to such not-yet-forgotten practices as weaving their own clothes from the wool of their sheep or from farm-grown fibers.

Those who believe that the "scissors" does not affect subsistence-type peasants in poor countries neglect to take into consideration that in order to buy anything the peasants must deprive themselves of such things as meat, milk, and eggs—regarded as prime necessities in many other countries—and even reduce their consumption of bread. When the price relation of farm to nonfarm products becomes greatly distorted, the peasants reweigh the comfort of having a light burning in the evening against enjoying an occasional piece of pork, and frequently decide against the light.

Such was the situation in the early 1930's in Rumania and adjacent surplus countries, when in the world depression the farm price of corn (maize) fell to less than half its previous level. Many peasants in Rumania, a mineral-oil country, chose to make pork from their corn and to sit in the dark in the evening rather than use kerosene lamps. Also, under normal conditions, the Rumanian peasant sells his wheat and eats mamaliga, a stiff corn-meal porridge; but when industrial goods are unobtainable or unreasonably dear, he eats more wheat bread and pork fattened on the corn. When the millions of mamaliga eaters make a step in the direction of a better, more balanced diet there is a great decline in market deliveries of both animal products and grain, and a greatly reduced proportion of wheat to corn in the curtailed total grain marketings.

This was the situation also in Czarist Russia; and so long as the peasants retained the right to decide what they would do with their produce, it could not be otherwise even under the Soviet regime.

Vegetable oil was the only product of which the rural population significantly increased its per capita consumption between 1913 and 1927–28—an increase made possible by rapid expansion of the relatively new sunflower. But even this increase was considerable only in relative terms; absolute quantities retained and consumed remained small. The rural population kept for its own use 1.1 million tons of oilseeds in 1927–28 (Table 19).

Part of this quantity was used for seed. Some 200,000 tons of sunflower seed were consumed in their natural state. The oil content of this seed was equivalent to about 0.5 kilogram per

TABLE 19.—PRODUCTION, MARKETINGS, GOVERNMENT PROCUREMENTS, AND EXPORTS, 1927–28*

(Thousand tons, except as noted)

Commodity	Production	Marketings[a]	Government procurements	Exports
Foodstuffs				
Grain	73,120	8,080	10,381	341
Oilseeds	3,400	2,290	1,157	30[b]
Sugar beets	10,100	9,760	9,871	...[c]
Potatoes	42,240	2,690	...	...
Vegetables	15,100	4,960	...	...
Milk and milk products	31,000[d]	5,160	...	...
Butter	408[e]	206[e]	82	33
Meat (including fat)	4,210[f]	1,350	714	41
Poultry	290	110		
Eggs (million)	10,000[g]	3,900	2,580[h]	1,360[i]
Raw materials				
Cotton	720	690	69	(145)[j]
Flax	250	120	123	42
Tobacco	44	39	30	6[k]
Makhorka[l]	130	120	78	...
Wool	170	57	40	(33)[j]
Hides, large (thousand)	14,100	12,300	10,370	40,000[m]
Hides, small (thousand)	66,900	31,700	23,925	

* Except as noted, data for production and marketings from *1st Plan*, II, Part 1, pp. 330 and 332; government procurements and exports from *Statistical Handbook USSR, 1928*, pp. 704–07 and 720–22. In general, marketings include government procurements. However, in the case of grain, procurements of which are larger than marketings, the government acquired grain in excess of the marketings recorded here to supply the rural population in grain-deficit areas. See note *a*, below.

[a] Excluding purchases of rural population.

[b] Calendar year 1928 (see *National Economy USSR . . . . 1932*, pp. 390–91); in addition 16,090 tons of vegetable oil were exported.

[c] Sugar exports in 1928 amounted to 136,395 tons (see *National Economy USSR . . . . 1932*, p. 391).

[d] Later revised to 30.1 million tons.

[e] *Statistical Handbook USSR, 1928*, pp. 268–69.

[f] According to *Statistical Handbook USSR, 1928*, p. 226, production of meat, including fat, was 3.64 million tons in 1927–28.

[g] Later revised to 10,488 million. See V. P. Nifontov, *Animal Husbandry USSR in Figures* (Moscow, 1932), p. 156.

[h] Reported figure 1,791,900 boxes; converted on basis of 1,440 eggs to a box.

[i] Reported figure 94,410 tons; 14,400 eggs per ton is apparently the official conversion factor.

[j] Imports for cotton; net imports for wool.

[k] Calendar year 1928; from *National Economy USSR . . . . 1932*, p. 390.

[l] A low type of tobacco.

[m] Tons.

[54] According to *Statistical Handbook USSR, 1928*, p. 256, 222,160 tons or about two kilograms per capita were so consumed by the rural population in 1926–27.

capita. The balance of the oilseeds retained was converted to oil in custom mills for the producers' account. Not much more than 1.5 kilos of oil per capita were obtained in this way. Thus the vegetable oil retained in all forms by the rural population did not substantially exceed 2 kilograms per capita per year. With the trade margins as large as they were, a much greater quantity of oilseeds would have been retained for processing in custom mills if the production (especially of sunflower seed, the most important of them) had not been highly localized.

Per capita milk consumption may have increased moderately since prewar, but the question cannot be answered from existing statistics.[55] Any increase would have been the result, primarily, of the absence of adequate markets, especially for butter, rather than peasant insistence on consuming more of these products.[56] Per capita meat consumption remained about unchanged.[57] The increased utilization by the peasants of their own fibers and hides probably did not offset smaller purchases of textiles. The decline in flax marketings to half the prewar level, detrimental to the state linen industry and flax exports, was due principally to the decline in flax production.[58] The rural population probably retained considerably more wool in 1927–28 than it did before the war, and the same may have been true of small hides used by the peasants for winter coats. The great decline in the marketing of potatoes had little to do with peasant consumption. The

[55] Milk production was estimated by the Gosplan as having increased from 26.4 million tons in 1913 to 31.0 million tons in 1927–28, and its estimate of the marketings was only 5.16 million tons for 1927–28 as against 5.81 million estimated for 1913 in *Socialist Agriculture USSR, 1938*. The Central Statistical Board, however, estimated the 1927–28 milk production at only 30.1 million tons and the marketings of that year at 6.24 million tons. While the first set of figures indicates an increase in per capita consumption of the rural population by about 13 percent, there was practically no change if the estimates of the Central Statistical Board are used.

[56] Provided the estimates used in Table 18 are correct, marketings of butter increased substantially above prewar. Moreover, the plan procurers, who had a monopoly of the export of butter—a very important outlet for this product—were unable to handle all supplies offered. See M. Kuritskii, "On Difficulties on the Butter-Procuring Market," *Economic Review*, June 1929, pp. 113–24.

[57] A small increase in meat production as compared with prewar was accompanied by a decline in marketings by 5 percent. But the rural population was larger by 10 percent.

[58] The quantity of cotton retained was small before and after the war. The producers kept an estimated 125,000 tons of flax from a production of 250,000 tons in 1927–28. In 1913 they retained only 82,000 tons, this quantity amounting to less than one-fifth of the output. (*The Bases of a Tentative Plan . . . . .*, p. 40).

principal reason probably was the discontinuance of the production of potatoes by large estates for distilleries. Although most of these distilleries had belonged to the estates, the distilled potatoes had been included with the marketings. Disorganization of trade channels, particularly disadvantageous to cheap perishable products, was probably responsible for the remainder of the difference in potato marketings between 1913 and 1927–28. The larger reduction in the marketing of eggs (Tables 18 and 19, pp. 223 and 228) was probably accompanied by a moderate decline in egg consumption by the rural population.[59] The decline in grain marketings likewise occurred in spite of a reduction in the consumption of grain for food by the rural population, from about 265 kilograms per capita before World War I to about 255 kilograms in 1927–28 (see Appendix Note J).

The Gosplan's assumption at the time of preparation of *Control Figures . . . . for 1928–29*, that the rates of feeding productive livestock in 1926–27 and 1927–28 were at least 20 percent above the prewar level, is not supported by other evidence (see p. 752, note 7). Increased utilization for productive livestock would have been first reflected in increased hog numbers, but these remained practically unchanged from 1924 to 1927.

Nor could an excessive accumulation of stocks in peasant hands be observed in those years. Large carryovers from good crops are of critical importance in farming areas with large year-to-year variations in yields, and sizable stocks were always maintained there in normal times. Areas located far from railways and waterways also customarily carried large stocks into the following crop years. The self-sufficient nature of the backward peasantry is in itself a stimulus to the accumulation of reserves *in natura*.[60] At that particular time the extreme deterioration of the value of money was fresh in mind. It must also be noted that the grain carryover is estimated in the USSR as of July 1, when the new crop is available for consumption in only a few areas. The producers need old grain after this date, not only for

[59] Production of eggs was estimated by the Gosplan at 10 billion in 1927–28 as against 13 billion in 1913. Marketings were curtailed by about 2.8 million and per capita rural consumption appears to have gone down at least in proportion to the increase in rural population.

[60] Concerning the large reserves normally kept by the peasants before the Revolution, see N. P. Oganovskii in *Socialist Economy*, V, 1927, 2d issue, p. 35.

themselves but especially for their horses. In view of these considerations, the following data on grain stocks in producers' hands as officially estimated do not indicate an excessive accumulation:[61]

July 1	Thousand tons
1925	3,495
1926	6,615
1927	9,529
1928	8,743

Because the 1924 grain crop was very poor, producers' stocks were nearly exhausted during the ensuing crop year. The peasants utilized the good crops of 1925 and 1926 to replenish their reserves, bringing them by July 1, 1927 to about 17 percent of the production ex-seed—by no means a high level under Russian conditions. The decline in the reserves during 1927–28 can be traced to the "extraordinary measures" to only a small extent. It is probable that the peasants' desire for stockpiles was by and large saturated.

The steep decline in grain marketings from 21 million tons in 1913 to 8 million in 1927–28 (Table 18, p. 223) is amply explained by a considerably smaller production and to a small extent by the growth of the rural population.

EXPORTS

Since pre-Revolution exports were not very large in relation to total output, or even to total marketings, the decline in marketings by some 30 percent would have sufficed to bring exports of most farm products to a full stop, if the requirements of the urban population were satisfied at the modest rate for which an effective demand existed. But exports were needed to pay for imports of raw materials and especially industrial equipment, and the greatest efforts were made to export everything possible. Still, exports of farm products in 1927–28 amounted to only 346 million 1927–28 rubles as against an average of 1,176 million prewar rubles in 1911–13. The 1927–28 exports, expressed in 1913 prices, were equivalent to less than one-quarter of the prewar value.

[61] *Statistical Handbook USSR, 1928*, p. 229.

The tabulation below compares the exports of the principal farm products in 1913 and 1928 (in thousand tons except for eggs):[62]

Item	1913[a]	1928
Grain	9,647	89
Flour	281	22
Millfeed	797	1
Oilcake	735	146
Seeds (mostly oilseeds)	324	29
Flax	305	39
Hemp	68	14
Tobacco, leaf	13	6
Butter	78	33
Eggs (carloads)	24,803	8,736
Meats	21	31
Poultry	13	18
Wool	18	2
Sugar	115	136
Vegetable oil	8	16

[a] Exports of 1913 are for 1913 boundaries.

The decline of 13 million tons in grain marketings between 1913 and 1927–28 was about 2 million tons greater than grain exports had been in 1913.[63] Since the requirements of the urban population remained about the same,[64] there obviously was virtually no grain for export. Exports of flax and wool were also negligible. The great decline in exports of oilcake and the discontinuance of millfeed exports were desirable phenomena. While exports of animal products also fell considerably, they became major items of the Soviet export trade. As before the war, eggs and butter had a commanding position; exports of poultry may even have been increased over the prewar level.

[62] *National Economy USSR . . . . 1932*, pp. 390–91.

[63] The figure in the text includes shipments to territories later separated from Russia (see p. 756).

[64] The urban population grew by 2.2 million.

PART III

SOCIALIZED ORGANIZATION AND CONTROL

CHAPTER XI

SOVKHOZY[1]

BEFORE THE DRIVE

From the viewpoint of Communists, large state-operated farms were the ideal form of organization of agricultural production. Yet even the most vivid imagination could not envisage such farms for Russia in 1917. With great apprehension the Communists viewed the rising tide toward subdivision of all the land, which threatened to wipe out all but the small and medium peasant farms and to leave not even a nucleus for a future socialist reorganization of agriculture. The resolution of the April 1917 Conference of the Russian Social Democratic Party (Bolshevist wing), after recommending the immediate full confiscation of all large estates and their surrender to the peasants, somewhat reluctantly continued:

> To recommend to the proletariat and semi-proletariat of the villages that they insist on the formation from each large estate of a sufficiently large model economic unit which should be operated at the common expense by the soviets of the deputies of farm workers, guided by agronomists, with the application of the best farm techniques.[2]

The peasants, however, landed and landless alike, did not share the enthusiasm of the Bolsheviki for state farms, or, for that matter, for any large-scale socialized farming. "Of 26

[1] "Sovkhoz" is an abbreviation of "Soviet farm." In the early days of the Revolution the term "state farm" would have been extremely unpopular. It is customary nevertheless to interpret sovkhoz as state farm in English. The official prewar statistics for sovkhozy usually included koopkhozy. These consisted of the farms run by organizations of the various Commissariats to provide their workers with food, and the farms of the Tsentrosoyuz (Central Union of Consumers' Co-operatives). There were 4,864 such establishments on January 1, 1935 (*Socialist Construction USSR, 1936*, p. 267). The source stated that 4,323 of these held 4,791,700 hectares of land, had 1,771,029 hectares in crops (in 1934) and on January 1, 1935, owned 10,503 tractors, 144,534 horses, 442,810 cattle, 551,727 hogs, and 233,884 sheep and goats. Unless otherwise stated, the data in the text cover both sovkhozy and koopkhozy.

For an earlier useful study of sovkhozy, see W. Ladejinsky, "Soviet State Farms," *Political Science Quarterly*, March and June 1938, LIII, 60–82 and 207–32.

[2] Quoted from *Sovkhozy at the XVth Anniversary of the October Revolution*, edited by Krylov, Commissariat of Agriculture USSR (Moscow, 1932), p. 4.

million hectares of land in large estates before the Revolution little more than 3 million hectares remained as state farms."[3]

The concept of the state farm as the highest and ultimate form of socialist reorganization was incorporated into the Law on Socialist Land Tenure by the All-Russian Central Executive Committee of February 14, 1919. Article 19 of this law reads:

> Soviet farms are being organized (*a*) to obtain the greatest possible increase in supplies by raising the productivity of agriculture, (*b*) to create the conditions for a complete shift to communist agriculture, and (*c*) for the purpose of creation and development of centers of best farming techniques.

The period of War Communism was ill adapted to anything constructive. The sovkhozy were "in a deplorable state."[4] Many consisted of all that was left of large private estates after peasants had taken the best portions. A large part of the sovkhozy, instead of producing for the market, became feeding places of a sort for urban and rural workers—very similar to the communes, the most socialized form of the kolkhozy (see page 299). A census taken in the RSFSR in 1920 showed 47.3 persons (workers and employees and their families) and only 59.2 hectares of cropped plowland per sovkhoz. Thus there were only 1¼ hectares of cropped plowland per person, or not much more than the average peasant household normally possessed. Many sovkhozy had 2 to 3 eaters per hectare of cropped plowland.[5]

During the NEP, the government was completely occupied with restoration of industrial production. It might have concentrated on industry even if the Party had not seen its principal strength in the urban proletariat. Funds allotted to the sovkhozy were insufficient for reconstruction in the early period of the NEP, and for the most part the state farms had to operate with what was left of the property of the former private owners after the best land, livestock, and machinery had been taken by the peasants. The sovkhozy of the feeding-place type were largely liquidated. The government was less lavish in subsi-

[3] *Sovkhozy at the XVth Anniversary . . . .*, p. 5.

[4] B. Knipovich, "Direction and Results of Agrarian Policies, 1917–20," *On Land*, ed. by a committee of the Commissariat of Agriculture, RSFSR (1st issue, Moscow, 1921), p. 30.

[5] *On the New Path*, V, Part 1 (Moscow, 1923), pp. 582 and 586.

dizing these, and with the restoration of urban industry the need for such places was reduced. The number of sovkhozy and their land declined sharply—the land from 3.4 million hectares in 1921 to 2.3 million in 1926.[6]

In 1925 the Party awoke to the deplorable condition of the farms that were destined to be the ultimate form of socialist reconstruction. The period 1926–28 was one of slow improvement. The investment in sovkhozy "rose from 36.4 rubles to 81.4 rubles per hectare of agricultural land in those years."[7] The land occupied by them again reached the level of the early revolutionary time (3.6 million hectares), although their cropped plowland was expanded only from 1,140,000 to 1,400,000 hectares during those years. The sovkhozy were also able to widen their activities as leaders in farm techniques, but only in a small way.

The Gosplan's analysis of activities of the sovkhozy in that period does not show significant achievements. The Gosplan even felt it necessary to emphasize that, except for sugar-beet sovkhozy, the state farms obtained yields only slightly exceeding averages for the country.[8] Obviously, the more efficient peasants had higher yields than the state farms.

IST PLAN PERIOD: GOALS

In working out the original goals for the 1st Plan Period the Gosplan, in spite of the strongest urgings by the Party, was reluctant to rely on the sovkhozy for a large share in total agricultural output. While the Plan provided for more than a threefold increase in gross production of sovkhozy in the basic variant and fourfold in the maximum, their share in the 1932–33 gross agricultural production was to be only 3.2 percent according to the maximum goal (Table 20). Since animal husbandry in general is much less adapted to large-scale production than is the raising of crops, it was natural that the expansion of

[6] *Sovkhozy at the XVth Anniversary . . . .*, p. 6.

[7] *Sovkhozy at the XVth Anniversary . . . .*, p. 8. In Soviet statistics "investment" usually does not include land, but in this case the term apparently has an even narrower meaning; the size of these figures suggests that they exclude not only land but all items other than means of production invested in during the Soviet era.

[8] *Control Figures of the National Economy USSR for 1928–29*, Gosplan (Moscow, 1929), p. 237.

sovkhoz activities was planned mainly in crops, primarily grain and specifically wheat. Rather optimistically the Plan specified a great increase in yields on state farms, especially in the maximum variant, but this was mere compliance with Party orders (see pp. 506–08). The portion of the 1st Plan pertaining to the sovkhozy was largely scrapped even before the entire Plan was approved in the spring of 1929.

TABLE 20.—SOVKHOZY: 1ST PLAN GOALS WITH COMPARISONS*

Year, goal or actual	Cropped plowland	Grain area	Grain production	Grain marketings	Total gross production	Total marketings
	Million hectares		Thousand tons		Million 1926–27 rubles	
1927–28, actual	1.2	.95	870	300	170	104
1932–33, goals of 1st Plan.						
Basic variant	4.4	3.4	3,770	2,800	570	424
Maximum variant	4.4	3.4	4,350	3,400	690	550
	Percent of USSR total					
1927–28, actual	1.1	1.1	1.1	3.8	1.2	3.6
1932–33, goals of 1st Plan.						
Basic variant	3.2	3.0	3.8	16.4	2.9	8.0
Maximum variant	3.1	3.1	4.1	17.3	3.2	8.6

* *1st Plan*, II, Part 1, pp. 328–29.

A new era for the sovkhozy—the heroic period of their history—opened in April 1928, when the Politburo of the Party approved a program, submitted by Stalin, for the development of new, large, specialized grain sovkhozy. The following August saw the founding of the Grain Trust which was to take charge of this enterprise. Similar plans dealing with the organization of large specialized sovkhozy for other crops and animal products followed in rapid succession. For cotton the change was brought about by the decision of the Party of July 19, 1929. The new livestock sovkhozy and their combinations began operation in 1930 in compliance with the decision of the Party of December 20, 1929.

More and more ambitious plans calling for huge, ever-expanding increases in sovkhoz production replaced one another in succession. The Party decision of April 1928 was fairly

modest in asking for "the organization in the RSFSR and the Ukraine of new large grain sovkhozy, so that after 3 to 4 years these farms would supply the country with not less than 100 million poods [1⅔ million tons] of marketed grain."[9] Soon afterward it was declared that by the end of the 1st Plan Period the grain acreages of the sovkhozy should reach 18,210,000 hectares, of which the Grain Trust alone should have 14 million hectares with several million tons of grain for market.

The tide of planning continued to run strong even after the initial results under the new plans had revealed the tremendous difficulties to those who had been unable to foresee them. In 1930, for example, the grain sovkhozy had 1.2 million hectares in crops and delivered 475,000 tons of grain.[10] The plan for 1931 ordered them to increase their area by 3.1 million hectares; all sovkhozy were to have 7.7 million hectares in crops and to deliver 4.85 million tons of grain.[11] A government order of August 11, 1930 mentioned that the Hog Combination was given the assignment of providing for the market 3 million hogs in 1931–32 and 7 million in 1932–33;[12] the higher figure was more than half as large as the total slaughter of adult hogs in a normal year.

The consolidated program for the activities of the sovkhozy in 1931–33, accepted by the Congress of Soviets on March 17, 1931 (Table 21), implied considerable retreats from previous decisions. Yet the approved figures were still enormous, especially considering the time schedule and the lack of experience.[13]

Investment.—Some of the various orders revising the goals of the 1st Plan contained more or less definite arrangements for providing the new enterprises with land, livestock, building materials, and feedstuffs. But in general everything proceeded

[9] I. Laptev, *Soviet Peasantry* (Moscow, 1939), pp. 74–75.

[10] *Agriculture USSR, 1935*, Commissariat of Agriculture USSR (Moscow, 1935), pp. 728–29.

[11] M. Wolf, "Plan of Socialist Reconstruction of Agriculture for 1931," *Planned Economy*, December 1930, p. 167.

[12] *Most Important Decisions on Agriculture*, State Publishing Office of Kolkhoz and Sovkhoz Literature (2d ed., Moscow, 1935), p. 503.

[13] The government order of Aug. 11, 1930, "On the Development of Livestock Sovkhozy," provided for a mobilization of at least 300 experts for the Hog Combination in 20 days. The same order requested that 25 sovkhoz directors be sent abroad to study large meat and dairy farms. There was, however, no time to learn.

in a very chaotic way—in contrast to the carefully worked out provisions of the 1st Plan.

Even the relatively moderate expansion of the sovkhoz activities planned by the Gosplan would have involved a large in-

TABLE 21.—SOVKHOZY: REVISED GOALS FOR 1ST PLAN PERIOD*

Item	1931	1932	1933
Cropped plowland (*million hectares*)	9.5	14	19
Livestock numbers (*million head, spring count*)			
Cattle of the Cattle Combination	2.8	5.0	7.0
Cattle of the Butter-Milk Trusts[a]	.42	.9	1.5
Hogs of the Hog Combination	1.9	4.5	6.3
Sheep of the Sheep Combination	4.4	9.0	15.0
Poultry of the Poultry Combination	3.0	10.0	20.0
Marketings[b]			
Total (*million rubles, 1930 prices*)	550–600	1,000–1,100	2,000–2,100
Grain (*million tons*)	3.1–3.2	4.8	6.6
Sugar beets (*million tons*)	3.8	5.2	6.6
Cotton fiber (*thousand tons*)	33–41	74	107
Meat (*thousand tons*)[c]	98–107	328	738
Butter (*thousand tons*)	10–11	21	41
Wool (*thousand tons*)	7	11	20

* Resolution of the VIth All-Union Congress of Soviets, Mar. 17, 1931, in *Most Important Decisions on Agriculture* (2d ed.), pp. 507–08. Principal sovkhozy only.

[a] Includes cattle of the Sugar Trust.

[b] The original data on marketings (expressed in poods) are more rounded than these figures.

[c] Assumed to be carcass weight, though the order did not specify. In that period and for some time thereafter, "meat" implied carcass weight. In a government order on development of hog-raising of Jan. 29, 1932, the delivery requirements were stated for "hog meat," but equivalents in the number of live hogs were given in brackets. These corresponded to only 57 kilograms carcass weight per hog. "Meat," especially in connection with deliveries, still meant carcass weight in the *2d Plan* (I, 239 and 529), which was not approved until 1934.

vestment. A total of 933 million rubles of current value was to be invested during the Plan Period, including 622 million from state sources—285 million in redeemable loans and 377 million in unredeemable funds.[14] But this was only a trifle as compared

[14] *1st Plan*, II, Part 1, p. 346. The current ruble of the 1st Plan was expected to have a *higher* value than the 1926–27 ruble.

with what was to come. The total investment in the sovkhozy and in their principal funds, or means of production, were rising in those years at a rate which reminds one of expenditures for armaments in the first years of war by a peaceful nation. This is shown by the following tabulation:[15]

Year	Investment during year (*million current rubles*)		Principal means of production at end of year (*million 1926–27 rubles*)
	Total	Principal means of production	
1928	....	....	299
1929	278	250	473
1930	1,190	954	1,160
1931	1,989	1,723	2,352
1932	2,040	1,730	3,022
1933	1,758	1,524	3,607
1934	2,355	2,015	4,139
1935	1,932	1,706	4,601

By the end of September 1933, the terminal date of the 1st Plan Period, considerably more than 3 billion 1926–27 rubles had been invested in the sovkhozy alone. The 1st Plan provided for a state investment of only 2,871 million rubles of current value in all agriculture during the Plan Period. Although the 1st Plan's ruble was to have a much higher value than the rubles actually invested, the new investment in the sovkhozy was nevertheless very large.

The sources of land for the new sovkhozy are discussed below. The formation of their livestock herds was greatly facilitated by the rapid liquidation of peasants' holdings by the peasants themselves. This fact was very important, whether the livestock was purchased by the sovkhozy direct from peasants or obtained through the State Meat Procurement Organization.

Sources of land.—The total land of the sovkhozy jumped from 3.6 million hectares in 1928 to 93.5 million on January 1, 1935.[16] The land of the sovkhozy proper (exclusive of kooptkhozy) amounted to 84.2 million hectares at this date. For 74.1 million hectares of the sovkhoz land (including also the koop-

[15] *Socialist Construction USSR, 1936*, pp. 240 and 244. Investment includes everything invested except the land; principal funds exclude also residential housing. The confusing presentation of the data for total investment and investment during specified years in values at different prices is that of the source. It was made advisedly; the reasons are discussed in Appendix Note C.

[16] *Agriculture USSR, 1935*, pp. 232–33.

khozy in two kraya) the official source gave the following distribution by type of land: 31.8 million hectares were classed as arable, 5.5 million as meadows, and 19.7 million as pastures, making a total of 57 million hectares of agriculturally usable land.[17]

The claim was officially made that the output of the sovkhozy would be additional to the peasant production. This was particularly stressed with reference to the grain sovkhozy.[18] They were to be established in outlying areas, the cultivation of which by primitive peasant techniques would have been very difficult.[19] A thorough check on these claims is impossible because the requisite details apparently have never been disclosed. It is nevertheless certain that the claims had little justification to begin with, and what little they had vanished later with the liquidation of the most unprofitable sovkhozy. The lands believed unworkable with primitive peasant techniques turned out to be unusable as arable land.

Chayanov wrote on the origin of the land for the new grain sovkhozy:

> In the majority of cases it was possible to allocate the land [for the sovkhozy] without trenching upon the peasant land, but occasionally the peasant acreages needed to be moved to other places . . . . with compensation. In some cases land was utilized for the sovkhozy which represented a surplus over the peasant-labor utilization.[20]

The second sentence in this cautious statement obviously pertained to land that was operated by the peasants with hired labor, or that could have been operated by them with hired labor or better machinery. Chayanov's evidence leaves no doubt that this, and possibly other land, was taken from the peasants for the sovkhozy without compensation in the form of other land. Moreover, even the land that was obtained by the grain sovkhozy from the State Land Fund had not been entirely unused before the organization of the sovkhozy and, in so far as it was not very submarginal, was capable of use for future peasant settlement.

The assertion that the sovkhoz production was supplementary

[17] *Agriculture USSR, 1935*, pp. 234–35.

[18] "According to the basic principle accepted in the establishment of the grain sovkhozy, their acreage has to be a net addition to the available acreage of the USSR." A. V. Chayanov, "The Technical Organization of Grain Factories," *Economic Review*, December 1929, p. 96.

[19] *Ibid.*

[20] *Ibid.*

to the peasant production was absurd also with reference to cattle and sheep raising by extensive methods. The large land masses assigned to the Cattle Combination and Sheep Combination were mostly located in the semiarid areas of the European Southeast, West Siberia, and especially Kazakhstan, some at great distances (up to 300 miles) from the railways. Little of this land had been plowed previously, and little was plowed subsequently by the sovkhozy. They may, it is true, have plowed a little more than before and the utilization of such specific pieces of land became more intensive. The utilization of the bulk of the land assigned to those combinations remained unchanged, as pasture and partly as meadows; the sovkhozy possibly cut a somewhat larger acreage of hay than the peasants had. Part of the land, it is true, may not have been actually in use at the time the sovkhozy were organized, because the collectivization drive brought about a great decline in livestock everywhere, and its virtual annihilation in Kazakhstan (see pp. 632–33).

Most of the hog sovkhozy and many others were organized in areas relatively better supplied with moisture, where no plowable land remained unplowed. This is apparent from the regional data on additional sovkhoz sowings. Of the 11.7 million hectares by which the sovkhoz cropped plowland was expanded in 1928–32, the share of West Siberia and Kazakhstan (where reserves of arable land were relatively the largest) was only 1.7 million hectares. On the other hand, the increase amounted to 2.3 million hectares in the Ukraine, a region of comparatively old settlement, and to 680,000 hectares in the Central Chernozem Region (roughly eastern Orel, Kursk, Voronezh, and Tambov oblasti) which was heavily overpopulated as far back as the 1880's or 1890's.[21]

The land of the cotton sovkhozy that existed in the early years of the Soviet regime was worked mostly by share croppers. But this practice had been greatly curtailed some time before the big drive.[22] The further expansion of the cotton sovkhozy occurred mainly on new irrigated land, which could have been

[21] *Agriculture USSR, 1935*, pp. 257–59.

[22] Osadko, "Results of Organization of Cotton Sovkhozy at the XVth Anniversary of October," *Sovkhozy at the XVth Anniversary . . . . .*, p. 113.

turned over to the local peasants. Part of the land utilized by the unimportant flax sovkhozy was reclaimed by them.[23]

Practically all land of the Land Fund suitable for agricultural use without substantial meliorations was mobilized for the new enterprises. A large part of the land originally assigned to the grain sovkhozy and some others and classed as arable or meadowland was submarginal to a high degree.[24] Part of the land of the new sovkhozy was taken from the peasants. The fact that ultimately the whole undertaking turned out to be of relatively small proportions gives no additional support to the claim (pp. 102–08 and 118–22) that Russia's land reserves are practically inexhaustible. Everything plowable without large meliorations is indeed already under the plow.

Farm size.—The Soviet enthusiasm for very large farms in the 1920's has already been discussed (pp. 26–30). Chayanov suggested not less than 100,000 hectares in crops as the optimum size of a grain sovkhoz. Each was to consist of branches with 8,000 to 12,000 hectares, the central branch in each sovkhoz providing the management and supplies and having the repair shop. "Gigant," "gigantic"—these were the terms widely used and advertised all over the world, and one of the new grain sovkhozy was even called "Gigant."

The non-grain sovkhozy were planned to be correspondingly large. The Order of the VIth All-Union Congress of the Soviets of March 17, 1931 on the organization of sovkhozy, proudly stated: "The sovkhozy with new advanced techniques, of a size unheard of in the history of mankind . . . . show to the peasants the advantage of large-scale production."

Full specialization.—The new sovkhozy were to be highly specialized; indeed they were intended largely as factories turning out one product only. The word "factory" appears in the title of Chayanov's article quoted above, and the term was commonly used in the late 'twenties. When the drive for the new grain sovkhozy started, it was understood from the beginning

[23] Krylov, "Flax Sovkhozy at the XVth Anniversary of October," *Sovkhozy at the XVth Anniversary . . . .*, p. 134.

[24] According to Obidin ("Grain Sovkhozy at the XVth Anniversary of October," *Sovkhozy at the XVth Anniversary . . . .*, p. 95), 16 percent of the land assigned to the grain sovkhozy had less than 12 inches of annual precipitation; half of the balance had 12 to 14 inches.

that only wheat would be produced. With minor exceptions, the same principle was to be applied to the other crops and to livestock enterprises as well. No heed was paid to the fact that such specialized farms can succeed only under specific, indeed rather rare, conditions.

With reference to the grain sovkhozy, the wheat farms of the Campbell Corporation Farms in Montana were again and again cited as an example of a one-product farm. The name Campbell was familiar to many Russians who knew nothing about the United States, and they believed that all or most of the American wheat was grown in enterprises like Mr. Campbell's. They also visualized the Campbell farms as much bigger than they really were and greatly overestimated the size of the individual machines used on those farms. In semiarid regions wheat lends itself to specialized enterprise better than any other field crop of the Temperate Zone, in the USSR as in the United States; but sidelines are found on most large wheat farms even in the United States, and the very low wage level in the USSR makes advisable even greater departures from full specialization than is practicable in this country.

Exceptions to the strict one-crop principle were made only in the case of sovkhozy raising such crops as sugar beets, cotton, and flax, which cannot be grown year after year on the same land. But even for these sovkhozy an excessive proportion of the land was scheduled for and actually planted to the principal crop. For example, of 40 cotton sovkhozy only 2 had less than 50 percent of their cropped plowland in cotton; 12 had 50 to 75 percent and 26 had more than 75 percent of their cropped plowland in cotton.[25] Much the same was true of sugar-beet and flax sovkhozy.[26] This disregard for the requirements of proper rotations could not fail to have a detrimental effect on the yields.

Certain livestock enterprises are adapted to large-scale specialized units. But in the Soviet Union only cattle and sheep ranching in semiarid areas belong in this category. Poultry raising is well suited to specialized treatment only where it is profitable to base it exclusively on purchased feed. In the USSR

[25] Osadko, *op. cit.*, p. 116. The data apparently pertain to 1932.

[26] See Krylov, *op. cit.*, p. 139, for data on flax sovkhozy.

and similarly poor countries, however, poultry are kept mainly on "absolute feed," such as accrues incidentally in general farming—things that would otherwise be wasted. Large-scale specialized hog enterprises outside the USSR are based on purchased concentrates to an even greater extent than chicken farms. Indeed, they exist almost exclusively in countries with large imports of feed which make such enterprises independent of year-to-year variations in domestic harvests and of seasonal variations in supplies. Even under these circumstances, however, a dairy-hog combination with roughage produced on the farm generally proves superior. In the USSR hog raising based on concentrates only is a luxury. The same weight of hogs is attained on general farms by extensive methods with half as much concentrates, or little more.

Full mechanization.—The new grain sovkhozy were to be completely mechanized, other sovkhozy as much as possible. Indeed, Chayanov in his article on the organization of the grain sovkhozy,[27] used "100 percent mechanization" as the title of the section discussing production techniques; the triad of tractor, combine, and truck was to do everything in the grain sovkhozy.

Chayanov realized that oxen, which can be maintained almost exclusively on straw, are a very cheap source of power where labor is cheap. Nevertheless, he found reasons for not including them in his plans. Oxen would greatly reduce the average size of each branch of the sovkhoz and necessitate the building of stables. They cannot be used in soft ground, in which crawlers perform admirably. Altogether, he argued, the use of oxen would have increased costs.

IST PLAN PERIOD: FAILURE AND ITS CAUSES

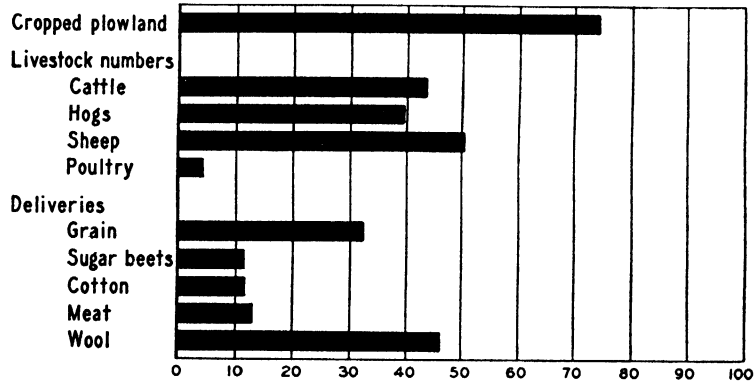
The failure.—The activities of the sovkhozy during the 1st Plan Period came to nothing short of a catastrophe, even with reference to the attainment of planned production. In terms of efficiency of production as reflected in yields of crops, milk, and eggs, breeding and mortality of animals, and so on, the failure was still more marked, but it was greatest with reference to the marketing goals of the sovkhozy (Chart 20).

[27] Chayanov, *op. cit.*, pp. 99–100.

The goal for expansion of cropped plowland was more than 70 percent fulfilled, partly, no doubt, through the inclusion of land on which a few kernels were strewn with little or no cultivation. The assembling of livestock (other than poultry) fell 50 to 60 percent short of the various goals, in spite of the opportunity offered by the peasants' panicky liquidation of their large holdings.

CHART 20.—SOVKHOZY: FULFILLMENT OF SPECIFIED GOALS DURING 1ST PLAN PERIOD*

(Actual data, 1933, as percent of goals)



* Data in Chart Appendix, which see for description of deliveries.

While the plan for acreage failed by less than 30 percent, deliveries of grain came to only one-third of the goal, those of sugar beets and cotton to little more than one-tenth. The poor results with the assembly of the herds constituted almost a success as compared with the attainments in delivery of animal products. The sovkhozy of the Commissariat of Sovkhozy were to market 41,000 tons of butter alone,[28] but delivered 27,562 tons of butter and milk in terms of butter.[29] All sovkhozy (including the koopkhozy) marketed only 879,000 tons of milk from 1,669,000 cows, or 527 liters per cow.[30] Meat deliveries came to only about 13 percent of the goal, while the goal for wool was 46 percent fulfilled.

[28] Resolution of the VIth Congress of Soviets, March 17, 1931.

[29] *Agriculture USSR, 1935*, p. 724.

[30] *Ibid.*, pp. 715, 724, 1233, 1262, and 1353. Butter converted to milk at the rate of 1:25 by the writer.

The marketings of animal products appear particularly small if one takes account of the fact that the sovkhozy used large quantities of purchased concentrates. Deliveries of concentrates to them were mentioned as early as in the government order of August 11, 1930. In an order of July 30, 1931, the state organizations concerned were requested to deliver to the livestock sovkhozy 250,000 tons of oilcake, 820,000 tons of millfeed, and 1,525,000 tons of feed grain. The quantities of animal products that could have been produced from this feed alone were greatly in excess of the sovkhoz deliveries in that year, although the livestock farms were supposed to base their production primarily on their own feed output.

The value of the gross production of the sovkhozy (including koopkhozy) in 1933 was estimated at 1,587 million 1926–27 rubles.[31] The figure needs to be revised downward, for the grain crops are expressed in biological terms and there are other exaggerations.[32] As it stands, it was little more than double the goal of the maximum variant of the original plan, but probably little more than one-half that of the revised plan.

The 1933 gross production of the sovkhozy as officially estimated was composed of the following items (in million 1926–27 rubles):[33]

Grain	459	
Technical crops	46	
Potatoes and vegetables	359	
Fruits, including grapes	28	
Other crop products	399	
Total crop products		1,291
Meat (including hog fat)	94	
Milk	98	
Hides	22	
Wool	13	
Other animal products	69	
Total animal products		296
Grand total		1,587

[31] *Socialist Construction USSR, 1936*, p. 234.

[32] On the appropriate downward adjustments of the officially computed value of gross agricultural production in all Soviet agriculture, see pp. 657–65. The corresponding discounts for sovkhozy cannot be ascertained for lack of data.

[33] *Socialist Construction USSR, 1936*, p. 234.

Especially noteworthy—in the light of the exuberance over attainments of the "Gigant" and other enormous wheat factories —is the fact that the figure for grain is so small even without any downward adjustment for the difference between the biological and barn crop. Properly adjusted, the value of the grain produced was no greater than that of potatoes and vegetables, crops unadapted to sovkhozy and produced mostly by the koopkhozy, an outgrowth of the failure of the sovkhozy and kolkhozy.

Reasons for the failure.—Several reasons can be given for the failure of the sovkhozy in those years, among them the limited adaptability of agriculture to large-scale production (especially under state operation), gigantomania, excessive specialization, inadequate labor organization. But these were relatively minor. The dominant factor in that early period was ignorance —crass ignorance of such simple facts as, for instance, that an animal has to be fed, or that a cow or sow must be bred. Read, for example, the repeatedly quoted jubilee publication, *Sovkhozy at the XVth Anniversary of the October Revolution.* Each of its seventeen articles starts with the colossal achievements of the sovkhoz drive, but the reader soon realizes that this adjective applies only to the scale on which the nation's wealth was squandered. One may know by heart all the important statements of Marx, Engels, Lenin, and especially Stalin, and still be a failure as the director of a grain trust with millions of hectares in crops, or of a beef-cattle or sheep combination with millions of animals.

The 1st Plan's maximum variant called for 12.8 quintals per hectare of grain in 1932. According to the exaggerated official estimate, all sovkhozy (including koopkhozy) obtained only 7.2 quintals in that year, yet the season was not one of unfavorable weather.[34] The new grain sovkhozy got about 5 quintals.

The hog sovkhozy were supposed to be enterprises with very intensive hog production. Such enterprises commonly produce some 15 hogs per breeding sow annually. Even in non-intensive hog enterprises, several hogs averaging about a hundred kilo-

[34] *Agriculture USSR, 1935*, p. 269. This source avoided stating either the yield or the total crop of the grain sovkhozy of the Commissariat of Sovkhozy, but these delivered to the state only 2.75 quintals per hectare in grain in 1932 (*ibid.*, pp. 728–29). Since there were no livestock in these sovkhozy, their own use of grain was restricted to seed and some distributions to or feeding of their own workers.

grams carcass weight are raised per breeding sow per year. Yet the sovkhozy of the Hog Combination delivered a total of only 108 kilograms live weight per breeding sow in 1932.[35]

How was this possible? To begin with, there were only 88 farrowings per 100 breeding sows in that year on the state hog farms. Each farrowing averaged 7.6 piglets, but 40 percent of these died before reaching two months of age. On the average only 4 piglets were weaned out of each farrowing, or 3.5 piglets per breeding sow per year. One-eighth of the young stock (two to nine months) and 3.3 percent of the adult hogs died. The yearly output per breeding sow was thus reduced to 3 hogs of varying ages. Of these, slightly over 1.5 were delivered to the government, averaging 65.1 kilograms live weight. The average delivery per breeding sow became 108 kilograms live weight[36] or about 70 kilograms carcass weight.

The cattle situation was similar.[37] The dairy-beef sovkhozy had 1,146,464 cows at the end of 1931 and 1,197,321 cows at the end of 1932. Only 805,000 calves were born in 1932, of which 53,700 were born dead. Of the surviving calves 29.5 percent died in their first year. The annual loss of yearlings amounted to 7.2 percent and of cows to 4.2 percent of the respective totals. Since a very large proportion of the cows were not bred and the milk cows were poorly fed, the milk yield per cow in the dairy-beef sovkhozy amounted to only 505 kilograms in 1932, or little more than half the country average before collectivization.

Laying hens, ducks, and geese of the poultry sovkhozy produced an average of 29.6, 18.4, and 3.8 eggs, respectively, in 1932.[38]

The order of the Party and government of November 27, 1931, stated:[39]

> The investigation of the operations of the grain sovkhozy [of the Commissariat of Sovkhozy] by special committees has disclosed an appalling wastefulness and an intolerably criminal attitude toward state property. The losses in harvesting, threshing, and transportation are appallingly large.

[35] Implied in data in *Agriculture USSR, 1935*, pp. 890–91.

[36] *Ibid.*, pp. 890–91.

[37] *Ibid.*, pp. 782–83.

[38] *Ibid.*, p. 1233.

[39] *Most Important Decisions on Agriculture* (2d ed.), p. 509.

Similarly, with reference to the livestock sovkhozy, the order of the same agencies dated March 31, 1932 declared:[40]

> The investigation has disclosed the following tremendous defects in the operation of the sovkhozy:
>
> (*a*) wastefulness and complete disorganization of the production processes;
>
> (*b*) entirely unsatisfactory organization of the care for the stock, excessive losses of young stock, high percentages of unbred animals, absolutely inadequate increase of the stock by way of reproduction on the farms, and poor condition of the herds . . . .

While the order pertaining to grain sovkhozy announced only the removal of the chairman of the Grain Sovkhoz Combination and ordered the Commissariat of Agriculture to penalize the other culprits, the order pertaining to the livestock sovkhozy contained a long list of those removed with or without indictment before the courts.

Except for the sheep farms, the sovkhozy were prohibited by the order from obtaining stock from the State Meat Procurement Organization (mostly peasant stock) in the future, and were advised to strive for an increase in their stock by saving their own offspring. The hog sovkhozy were forbidden to farrow their hogs in the winter during the next two years.

This survey of the heroic period in the history of the sovkhozy may fittingly close with a quotation from the above-mentioned jubilee publication,[41] the title page of which is headed, "Commissariat of Agriculture USSR, Scientific Research Sovkhoz Institute, the System of All-Union Academy of Agricultural Sciences in the name of V. I. Lenin":

> The gigantic historic victories of October are most strikingly reflected in the socialist reorganization of agriculture. In place of the backward, small-scale, tiny peasant economy there has been created, in the form of kolkhozy, sovkhozy, and MTS, the most advanced, largest-scale economy that the world has ever seen.
>
> The superiority of socialism over capitalism has found in this its most pronounced reflection.

The subsequent history of the sovkhozy was gradual acceptance of mediocrity.

[40] *Ibid.*, p. 511.
[41] *Sovkhozy at the XVth Anniversary . . . . .*, p. 27.

2D PLAN PERIOD

Goals.—An unbiased appraisal of the experience with sovkhozy during the 1st Plan Period would have led to liquidation of the whole undertaking. Even the Bolshevik enthusiasts were shaken. Reorganization of the sovkhozy, rather than further expansion, was to be the main feature of the 2d Plan Period.

A more effective utilization of the facilities that were already fully or partially available would have brought about a large increase in production. But a considerable additional investment was needed to permit such effective utilization. The planned investment in the sovkhozy during the 2d Plan Period was nevertheless no larger (inflation considered) than that in the 1st Plan Period. The transfer of emphasis from sovkhozy to kolkhozy is particularly evident in the fact that the investment in sovkhozy during the 2d Plan Period was to exceed that in the 1st Period by only 29.6 percent (in terms of current rubles) against a planned increase of 466 percent in the investment in the MTS.[42]

The 2d Plan called for an increase in sovkhoz cropped plowland from 13.4 million hectares in 1932 to only 16.8 million in 1937[43] (19 million hectares had been planned for 1933). It came to be realized that part of the sovkhoz land was unsuitable for crop production, and that continuous cropping of another part was highly inadvisable.

The wheat output of the sovkhozy was scheduled to be almost trebled, largely by boosting yields at least 60 percent above the 1930–32 level.[44] The goal of 3 million tons for grain deliveries from the sovkhozy in 1937 was, nevertheless, relatively moderate —less than half the goal for 1933 and constituting only 10 percent of all centralized deliveries to the state as planned for 1937.

The herds projected for 1937 were about equal to those planned earlier for 1933 (for poultry they were only one-fifth as large). Following are the livestock goals for 1937 as compared with the actual stock in 1932 and 1933 (million head):[45]

[42] *2d Plan*, I, 442.

[43] *Ibid.*, p. 431. While the figure for 1937 was for all sovkhozy, including the koopkhozy, that for 1933 did not cover even all sovkhozy.

[44] *Ibid.*, p. 222.

[45] *Ibid.*, p. 474. Spring counts, except for poultry and rabbit does, for which the data are end-year.

Type of livestock	Actual 1932	Actual 1933	Goal 1937	Planned increase 1932 to 1937 (*Percent*)
Cattle	3.5	3.8	6.7	91.4
Cows	1.7	1.7	2.5	47.1
Hogs	1.9	2.6	6.4	236.8
Sheep and goats	7.2	7.7	14.9	106.9
Poultry	1.3	1.5	4.0	207.7
Rabbit does	1.7	1.2	2.2	29.4

The extraordinarily low yields per animal in 1932 permitted the planning of large relative improvements without attempting anything really big. This is shown by the following comparison (in kilograms):[46]

Yield	Actual 1932	Goal 1937
Milk yield per cow in dairy sovkhozy	827	1,700
Average live weight of cattle delivered by the meat sovkhozy	220	300
Average live weight of hogs delivered by the hog sovkhozy	65.1	106.5

A marketed hog of 106 kilograms live weight, equivalent to about 70 kilograms dressed weight, would certainly be a low average.

In view of the expected large increases in the herds and in yields per animal, the meat output of the sovkhozy was to expand almost four times—by 273.7 percent. Milk production was to increase by 178.5 percent and wool by 155.7 percent.[47]

The very large output projected for 1937 made it possible to paint a picture of abundant deliveries. The sovkhozy were expected to supply not less than 614,500 tons of principal meats (dead weight, without offal), and 2,490,000 tons of milk and milk products in terms of milk.[48] According to the plan, about one-quarter of the greatly expanded total marketings of those products in 1937 would be covered by the sovkhozy.

The 2d Plan made no mention of egg output and deliveries by the sovkhozy—the weakest spot in their activities in the 1st Plan Period.

Fundamental changes in the setup of the sovkhozy were to take place during the 2d Plan Period. Both "gigantomania" and extreme specialization were declared ideas of enemies of the

[46] *Ibid.*, p. 234. [47] *Ibid.*, p. 235. [48] *Ibid.*, pp. 239 and 529.

country. The originally desired rate of mechanization had also to be cut somewhat. Last but not least, changes were planned in labor organization. The measures prescribed paralleled those applying to organization of labor in kolkhozy (see pp. 401–10). As in the collectives, the organization of the labor force into brigades and later into squads, and general resort to piecework, premiums, and other incentives—in other words, individual effort, individual reward, and competition of every kind—were the principal means by which the great inefficiency and high cost of labor were to be combated.

Both the deplorable state of the sovkhozy in 1932 and the boundless enthusiasm in planning for the future were unmistakably reflected in the prescription that during the 2d Plan Period the cost of production in the sovkhozy of the Commissariat of Sovkhozy must be cut by 63.3 percent, or to little more than one-third of that in 1932.[49] With such a huge task ahead, it was at least rash to declare in the *Draft of 2d Plan*:

> Sovkhozy will have developed into mighty, highly productive and profitable enterprises, which along with their ever growing role as models of large-scale socialist production will have a substantial share in the production of the principal foodstuffs for the market.[50]

The approved text of the 2d Plan said the same in a few more words.

De-enlargement.— The reorganization plans for the sovkhozy had already been drawn up and put into operation before the end of the 1st Plan Period. The first reorganization of the grain sovkhozy was prescribed by orders of the Commissariat of Agriculture of August 1931 and of the government and Party of November 27, 1931. The reorganization plans for the livestock sovkhozy were part of the order of March 31, 1932, quoted above, which contained the long list of penalized scapegoats.

Important measures for improving the operations of the grain sovkhozy which accompanied the "de-enlargement"[51] were the transfer of land unsuitable for use as arable land to other sovkhozy which could use it as pasture, and the entire liquidation of the grain sovkhozy that were most unfavorably located. In this

[49] *2d Plan*, I, 518. [50] *Draft of 2d Plan*, I, 223.
[51] A literal translation of a term coined specifically for the occasion.

way were restored to their natural uses those very lands[52] which, it was claimed, could be utilized only by sovkhozy and thus represented a net addition to the agricultural potential.

The cutback of the size of the individual grain sovkhozy, decided upon in 1931, proved insufficient. According to the government order of December 22, 1933, the grain sovkhozy were to be broken up into units with no more than 20,000–25,000 hectares of arable land, or 15,000 hectares in those with a large proportion of row crops. Each branch of the sovkhoz should not have more than 2,000–2,500 hectares of cropped plowland, and each was to operate on its own budget.

The order of March 31, 1932 limited the beef sovkhozy to 3,000–8,000 head of cattle each, depending on the area. A dairy sovkhoz was not to have more than 1,000 cows; each sovkhoz was to be subdivided into branches with 200–400 cows each. A hog sovkhoz in the so-called consuming regions, as well as in White Russia and South Caucasus, was to have not more than 400 breeding sows, in the Ukraine and Central Chernozem Region not more than 700, and elsewhere not more than 1,000. Each branch of a hog sovkhoz was permitted to have no more than 100 to 150 breeding sows. The upper limit for a sheep sovkhoz was established at 10,000 fine-wool and 50,000 coarse-wool sheep.

The following data show the effect of the de-enlargement campaign on the sovkhozy of the Commissariat of Sovkhozy:[53]

Type of sovkhozy	1931	1934
Grain		
Number of sovkhozy	182	357
Number of branches	1,177	1,750
Cropped plowland (*thousand hectares*)	4,353	3,286
Dairy-beef		
Number of sovkhozy	341	829
Cattle (*thousands*)	2,384	1,808
Hog		
Number of sovkhozy	544	787
Breeding sows (*thousands*)	315.3	165.8
Sheep		
Number of sovkhozy	134	206
Sheep and goats (*thousands*)	4,543	3,699

[52] See Obidin, *loc. cit.* and T. Urkin, "To Fulfill the Order of Party and Government on Sovkhozy," *Socialist Reconstruction of Agriculture*, February 1932, p. 147.

[53] *Agriculture USSR, 1935*, pp. 728, 782, 890, and 966. Number of sovkhozy for end of year.

Thus the average cropped plowland per grain sovkhoz declined from 27,489 in 1931 to 9,205 hectares in 1934, and corresponding contractions took place in the other types of sovkhozy. It is easy to visualize the losses in investment and other extra costs brought about by these reorganizations.

Diversification and de-mechanization.—The government order of December 22, 1933, which cut down the size of the individual grain sovkhozy, also sought to put an end to their extreme specialization, another ideal formerly cherished. It stated:

> For the purpose of increasing the marketings of the grain sovkhozy, better utilization of the residuals of grain production as well as of the meadows and pastures, to include in the activities of grain sovkhozy as sidelines sheep, cattle, swine, and poultry.[54]

Dairying was not mentioned, probably for a reason; but this too was changed later.

By other orders, greater diversification was prescribed also for sovkhozy specializing in crops other than grain, as well as for the livestock sovkhozy, in the latter case by including other types of livestock as subsidiary enterprises. Sovkhozy of all types, however, proved too inelastic to deal with more than one product, and little progress was actually made toward diversification.

The order of December 22, 1933 furthermore dropped the idea of total mechanization of the grain sovkhozy. The livestock sovkhozy were ordered to deliver to grain sovkhozy 25,000 to 30,000 oxen (including young animals) for use as draft power.[55] Somewhat later the grain and other sovkhozy started to use horses also.

The day after this major order for the reorganization of grain sovkhozy was issued, the prices of motor fuel to the sovkhozy and MTS were raised more than tenfold (see pp. 464–65). This measure should have greatly fostered the use of animal power by the sovkhozy, but they also proved inelastic in this matter. The sources of power of the sovkhozy were never brought into proper relation to their relative costs.

Production and delivery results.—The ambitious goals not-

[54] *Most Important Decisions on Agriculture* (2d ed.), p. 520.

[55] *Ibid.*

withstanding, the gross production of the sovkhozy increased only moderately, from 1,390 and 1,587 million 1926–27 rubles in 1932 and 1933 to 1,865 million and 1,631 million in 1937 and 1938 respectively.[56] According to official computations, gross production of the sovkhozy was 9.3 percent of the total in 1937 as against 10.6 percent in 1932.[57]

The development of acreages and livestock numbers of the sovkhozy during the 2d Plan Period bore little resemblance to the plan. This is shown by the following official data (in million hectares and million head):[58]

	1932	Goal 1937	1933	1934	1935	1936	1937
Cropped plowland....	13.4	16.8	14.1	15.1	16.2	15.2	12.2
Cattle	3.2	6.2	4.0	4.3	4.0	4.3	3.7
Hogs	1.8	5.5	4.0	3.7	4.0	3.3	2.8
Sheep and goats.....	5.7	12.2	6.2	6.7	7.2	7.3	7.0

Thus cropped plowland declined instead of increasing. Flax production by the sovkhozy was virtually discontinued, while the acreages in sugar beets and cotton were cut drastically. The increases in livestock herds were only 17–27 percent of those planned.

Year-to-year figures show that both in acreages and in herds a moderate peak was reached by the sovkhozy around 1935. Then a decline started. In 1935 the ambitious hopes of making the sovkhozy a great factor in Soviet agriculture were definitely abandoned. Over 20 million hectares, or about one-quarter of the total sovkhoz land, were turned over to the kolkhozy between the end of 1935 and March 1937.[59]

While substantial improvements in yields per hectare and per animal from the low points of 1932 were attained during the 2d Plan Period, the levels reached afforded no cause for boasting. The sovkhozy (possibly only those of the Commissariat of Sov-

[56] *Socialist Construction USSR, 1936*, p. 234, and *Socialist Agriculture USSR, 1938*, Gosplan (Moscow, 1939), pp. 29 and 87. On the needed downward revisions of all such figures, see pp. 657–68.

[57] *Socialist Agriculture USSR, 1938*, p. 87.

[58] Livestock numbers for the end of the year.

[59] L. E. Hubbard, *The Economics of Soviet Agriculture* (London, 1939), p. 128.

khozy) averaged the following grain yields (quintals per hectare):[60]

1933	5.1
1934	5.9
1935	7.1
1936	5.8
1937	9.9

While the increase was large compared with the disastrous level at the beginning of the 2d Plan Period, only in 1937, an exceptionally favorable year, were the sovkhozy able to exceed the country-wide pre-collectivization level of about 8 quintals.

The milk yield of 1,458 kilograms per cow in dairy-beef sovkhozy in 1937 was well below the goal of 1,700. This, however, was about reached in 1938.[61] The average weights of the cattle and hogs delivered by the cattle and hog sovkhozy fell short of the goals, and were lower in 1938 than in 1937. Cattle weighed 277 and 271 kilograms in 1937 and 1938, compared with the 300-kilogram goal for 1937; hogs averaged 94 and 91 kilograms (live weight) in 1937 and 1938 as against the 1937 goal of 106.5 kilograms.

Deliveries by the sovkhozy were considerably higher in 1937 than 1932, but this was partly due to exceptionally favorable weather in 1937. The accompanying data (in thousand tons) reveal this increase:

Product	1932	1937	Percentage increase
Grain	1,590	4,120	159
Sugar beets	998	1,507	51
Cotton (unginned)	41	133	224
Milk	690	1,670	142
Meat (live weight)	154	339	120
Wool	12.5	20.1	61

The goal for grain deliveries by the sovkhozy was substantially exceeded, but the favorable growing conditions were responsible

[60] A. Shimichev, "Ways of Converting Sovkhozy into Model Enterprises," *Socialist Agriculture*, July 1939, p. 45, and I. E. Kantyshev, "Sovkhozy Under War Conditions and in the 4th Five-Year Period," *Socialist Agriculture*, July-August 1946, p. 43. Only the figure for 1937 was stated; those for other years are implied in Kantyshev's relative data. The question whether the figures pertain to all sovkhozy or only to their principal group comprised in the Commissariat of Sovkhozy is discussed on pages 741–42.

[61] The preliminary official figure is 1,788 kilograms. See pages 650–51 on the necessity of a downward revision of the 1938 estimates of milk yield and output.

for all or most of the excess. Furthermore, the grain distributed to sovkhoz workers and employees in lieu of pay was apparently included in the actual 1937 deliveries but may not have been included in the planned deliveries. Deliveries of milk, which made the best showing among animal products, were about two-thirds of the goal in 1937; wool fared slightly worse, while little more than one-quarter of the meat deliveries planned for the sovkhozy materialized.

3D PLAN PERIOD

Goals.—The policies of the 3d Plan with reference to sovkhozy were those that had been decided upon around 1935; they limited expansion to such as could occur by improvement of existing farms. These improvements, however, required further large investments. In line with the goals the new investment (amount not stated) was earmarked for the construction of stables for livestock, sheds for machinery, houses for personnel, and similar improvements.[62] A further liquidation of "excessive specialization" was to be an important part of the reorganization plans.

Gross production was to be nearly doubled during the 3d Plan Period. Of the two production factors, acreage and livestock numbers on one hand and yields on the other hand, the yields were again to be the larger source of the increase in output. While the grain acreage of the Commissariat of Sovkhozy was to be expanded 28 percent, yields were to be raised 36 percent above the high level of 1937.[63] The 1942 goals for livestock numbers represented the following percentage increases over 1937: horses, 42; cattle, 29; hogs, 40; sheep and goats, 59. The milk yield per cow, however, was to increase 60 percent, and delivery of pork per sow 112.7 percent. Only in the case of wool was the yield not expected to keep pace with the increase in herds. However, the planned increase of 28 percent in the yield of wool per sheep was, in itself, very large.[64]

The milk yield per cow was scheduled to reach 2,500 kilograms in 1942, and the output of hogs 1,422 kilograms live

[62] *3d Plan*, p. 136.
[63] A. Shimichev, *op. cit.*, pp. 47–48.
[64] *Ibid.*

weight per sow. Both yields must be considered excessive for Russian conditions, especially since a considerable increase in the proportion of cheap farm-produced feed in the rations of the animals was simultaneously requested.[65] The goal for the increase in the yield of wool per sheep also was unrealistic.

The scheduled increases in yields per hectare and per animal as well as in labor productivity were to result in a 27 percent reduction in production costs in the sovkhozy of the Commissariat of Sovkhozy.[66] If the effect of the excellent crop of 1937 were discounted, the planned decline in production costs would have exceeded 30 percent.

Attainments.—The developments in sovkhoz activities in 1938 to 1940 have never been published in detail. Some of the figures for 1940 used below may include part of the sovkhozy in the new territories. The 1937 and 1938 data used for comparison, however, are for the pre-1939 territory. During the peace years of the 3d Plan Period, the sovkhozy experienced increasing difficulty in obtaining suitable labor. This may have been one reason—a minor one—why little if anything was accomplished toward fulfilling the ambitious goals set for the three-and-a-half years preceding Soviet entrance into the war.

Cropped plowland of the sovkhozy increased moderately from 1937 to 1940,[67] but all or most of the increase was in sown grasses; the grain acreage at best remained unchanged.[68] The sovkhozy harvested 8.6, 7.8, and 8.7 quintals of grain per hectare in 1938, 1939, and 1940 respectively, or 8.4 quintals on the average. All sovkhozy of the Commissariat of Sovkhozy delivered around 3 million tons of grain in 1940;[69] in 1937 the

[65] *3d Plan*, p. 112.

[66] *Ibid.*

[67] N. Anisimov gave it at 13.1 million hectares for 1940 in *Agriculture in the New Stalin Five-Year Period* (Moscow, 1946), p. 110. It was 12.2 million in 1937.

[68] This seems to be implied in the data on acreages in grain and livestock sovkhozy in 1940 given by S. F. Demidov, *Development of Agriculture in the Postwar Five-Year Period* (Moscow, 1946), p. 94. Demidov, who compared the figures for 1940 with the goal for 1950, gave the total cropped land and the grain area of those sovkhozy in 1940 at 8.9 and 6.3 million respectively. I. E. Kantyshev in *Sovkhozy under Conditions of the Great Patriotic War* (Moscow, 1946), p. 11, stated, however, that the same acreages of the same groups of sovkhozy increased as follows from 1938 to 1940: total cropped plowland, 7.7 to 9.6 million hectares, and grain area, 5.9 to 6.7 million hectares.

[69] Andreev in his report of February 1947 said: "about 200 million poods [3.28 million tons]," but Soviet "abouts" are always equivalent to "below."

grain sovkhozy of that Commissariat alone delivered 2.7 million tons. Thus in acreage, yields, and deliveries of grain, the sovkhozy apparently remained approximately at the level reached in 1937, if yields and deliveries of that year are reduced to what would probably have been achieved with average weather conditions.

Except for hogs, the livestock herds of the sovkhozy in 1937–40 continued the decline from the peak reached about 1935. The following end-year data reveal the changes (in million head):[70]

Type	1937	1940
Cattle	3.7	3.0
Hogs	2.8	2.9
Sheep and goats	7.0	6.8

The deliveries of animal products by the sovkhozy of the Commissariat of Sovkhozy in 1940 are compared in the accompanying tabulation (in thousand tons) with the 1937 deliveries of all the sovkhozy of the same group for which data are available.[71]

Item	1937	1940
Meat (live weight)	180[a]	270
Milk	725[b]	900
Wool	12.9[c]	15

[a] Dairy-beef and hog sovkhozy only.
[b] Dairy-beef sovkhozy only.
[c] Sheep sovkhozy only.

Including the probable deliveries of meat, milk, and wool in 1937 by those sovkhozy for which data are not at hand, wool and milk deliveries remained about unchanged from 1937 to 1940, and meat deliveries increased moderately.

THE PREWAR STATUS

Little can be learned of the sovkhoz activities in 1939 and 1940, and little would be gained from a detailed discussion of their deplorable state in 1945 or 1946, even if available data

[70] Data for 1940 from Anisimov, *loc. cit.* These figures on livestock are given in the same paragraph as other data that clearly pertain to all sovkhozy including koopkhozy. Data for 1937 for sovkhozy including koopkhozy from usual sources.

[71] Data for 1937 from *Socialist Agriculture USSR, 1938*, pp. 30–31; data for 1940 from Andreev's report of February 1947.

made it possible. It therefore seems advisable to give a few details on the status of the sovkhozy around 1938, when they had probably about reached the peak of their achievements in production and deliveries.

At the end of 1938 there were 3,961 sovkhozy (excluding koopkhozy), distributed as follows:[72]

Crop sovkhozy		Livestock sovkhozy	
Grain	478	Dairy-beef	769
Sugar beets	180	Hog	659
Cotton	38	Sheep	204
Fruits, potatoes, vegetables	474	Horse and camel	119
Tobacco (including makhorka)	29	Reindeer	36
Tea	22	Poultry	102
Medicinal herbs and similar crops	16	Wild animals	14
Rubber	17	Silk	12
Hops	10	**Miscellaneous sovkhozy**	
		Suburban	723
		Mixed and various	59

Specifically the Commissariat of Sovkhozy in 1937 combined 1,709 sovkhozy, distributed as follows:[73]

Grain	340
Cotton	39
Cattle	718
Hog	424
Sheep	188

The sovkhozy of the Commissariat of Sovkhozy were on the average much larger than the others.

Land, investment, and output.—All sovkhozy, apparently including koopkhozy, had 51.1 million hectares of agriculturally usable land in May 1937.[74] The investment in sovkhozy at the beginning of 1938, which as usual did not include the value of the land, was evaluated at 7,253 million accounting rubles, of which the investment in the principal means of production amounted to 5,663 million rubles.[75] In terms of accounting

[72] *Socialist Agriculture USSR, 1938*, p. 28.

[73] *Ibid.*, pp. 30–32.

[74] *Kolkhozy in the 2d Stalin Five-Year Period*, Gosplan (Moscow, 1939), p. 9. Anisimov (*loc. cit.*), however, gave the land of the sovkhozy (including the koopkhozy) in 1940 at over 67 million hectares.

[75] *Socialist Agriculture USSR, 1938*, p. 29.

rubles, the investment in the principal means of production was exactly the same in sovkhozy as in the MTS; but the investment in sovkhozy consisted to a much smaller extent of highly overvalued tractors, trucks, and other machinery. On the basis of reasonable prices, the investment of the sovkhozy in principal means of production was at least twice as large as that of the MTS (see pages 716–17). Other investment in the sovkhozy was several times greater than in the MTS. The relatively large investment in the sovkhozy looms much larger still if their small production and deliveries are compared with the large production and deliveries of the kolkhozy served by the MTS.

The sovkhozy in 1938 had 12.5 percent of all horses, 18.8 percent of all tractor power available on farms, 17.3 percent of all combines, and 15.6 percent of all trucks, but only 9.1 percent of the total cropped plowland. Their share in productive livestock in the same year was as follows: cattle, 7.3 percent; hogs, 11.0 percent; and sheep and goats, 10.5 percent.

As stated previously, the value of the gross production of the sovkhozy amounted to 9.3 percent of the total in 1937. Owing to the small proportion of livestock products in the total output of the sovkhozy, and therefore a smaller amount of duplication in the computation of the gross production, their share in the volume available for sale and for consumption in the farm home may have moderately exceeded 10 percent. The share of the sovkhozy in gross agricultural production and in the volume available for sale and for consumption in the farm home certainly did not increase in 1937–1940.

Available data do not permit a computation of the share of the sovkhozy in marketings; these were probably not quite 20 percent of the total in those years.

Productivity.—The average grain yield in sovkhozy in 1938–40 was about 10 percent below that obtained by large producers before World War I. The portion of the sovkhoz grain acreage grown under very adverse climatic conditions had declined considerably by 1938, and, so far as yields were concerned, the disadvantage of insufficient moisture of some lands still used by them was largely offset by extensive use of fallow. That poor land was not the principal cause of the low yields in sovkhozy is

apparent from a study of the sovkhozy in the East by Bushinsky and Kotlyarov. Writing in 1940, they said:

> Combat of weeds has exceptionally large, decisive importance for the immediate future . . . . The investigation of the Kamaliv selected-seed station has shown that the fields of Kamaliv and Borodin grain sovkhozy are infested by weeds to the extent of 28 percent.[76]

According to exaggerated official estimates (see pp. 649–51), the cows of the dairy-beef sovkhozy averaged 1,788 kilograms of milk in 1938 as against the official estimate of 1,100 kilograms for the kolkhoz commercial fermy in that year,[77] but the sovkhoz cows received many times as much purchased concentrates as did the kolkhoz cows.

An official investigator, writing in 1938, believed that, in the sovkhozy that he surveyed and accepted as typical, gross production could have been increased between 1937 and 1942 by percentages ranging from 133.6 to 237.2.[78] The goals of the 3d Plan were apparently based on these and similar findings. Although those goals were not entirely realistic, the huge scheduled increases certainly testified to low productivity of the sovkhozy in 1937 and, since there was little subsequent change, in succeeding years as well.

The analysis on pages 436–38 shows that labor productivity in the sovkhozy is much less than twice that in the kolkhozy. Since labor productivity in the kolkhozy is almost incredibly low, it is small in the sovkhozy as well. This is officially recognized. Kantyshev believed that, in the sovkhozy he investigated, the productivity per man could have been raised between 1937 and 1942 by percentages ranging from 132 to as much as 222.5.[79]

Profitableness.—An analysis of the financial results of the sovkhozy is impossible because whatever evidence is available is expressed in meaningless rubles. One must resort to sweeping appraisals or be satisfied with isolated examples.

Permanent workers and employees in the sovkhozy numbered

[76] V. Bushinsky and Y. Kotlyarov, "The Technical Agricultural Level in Sovkhozy of Eastern USSR," *Socialist Agriculture*, August-September 1940, p. 97.

[77] *Socialist Agriculture USSR, 1938*, pp. 34 and 78.

[78] I. E. Kantyshev, "The Principal Problems in Planning the Organization of Sovkhozy," *Socialist Reconstruction of Agriculture*, October 1938, p. 73.

[79] *Ibid.*, p. 73.

hardly less than 1.4 million in 1938, and in addition there were perhaps 600,000 seasonal and 400,000 temporary workers.[80] Since the proportion of employees, as distinguished from workers, is high in the sovkhozy (15.3 percent of all permanently employed on July 11, 1935), and their pay greatly exceeds that of a common worker, it will not be an exaggeration to assume that the total number of workers and employees (the latter in terms of workers on the basis of the workers' average pay) occupied steadily (for a season or more) was around 2.5 million in 1938. Hence the volume available for sale and for consumption in the farm home per steadily occupied worker in the sovkhozy around 1938 was only about five hundred 1926–27 rubles.

Unskilled farm labor is very cheap in the USSR, but tractor drivers and combine operators, who make up a considerable percentage of the sovkhoz workers, receive perhaps three times as much as unskilled workers. This, combined with the great number of all workers and the large proportion of employees in the sovkhozy, results in a rather high total outlay for the workers and employees. Other costs of the sovkhozy are also considerable. Since they are more extensively mechanized than the rest of the Soviet farms, there are heavy charges for motor fuel, lubricants, and depreciation of machinery. The sovkhozy growing technical crops, fruits, and vegetables utilize considerable amounts of commercial fertilizer, while the livestock sovkhozy purchase a great deal of feed.

Feed normally comprises 75 to 80 percent of the cost of hog production. Indeed, 80 percent is the figure ascertained in Danish farms investigated over a long period of years (1917–39.)[81] One may be reasonably certain that in the Soviet hog sovkhozy all costs other than of feed, on a relative basis, are

[80] On July 1, 1935, according to *Socialist Construction USSR, 1936*, p. 533, the permanent personnel numbered 1,736,000 persons, and seasonal and temporary workers 1,410,300. *Socialist Agriculture*, Nov. 2, 1947 gave a figure of 1,370,000 all-year workers in sovkhozy. If this is correct the figure in the text appears to be an overestimate. The discrepancy is not great, however, because the *Socialist Agriculture* figure pertains only to sovkhozy (the computation in the text includes the koopkhozy) and may not even include the employees of the sovkhozy proper. Moreover, the computation in the text counts as permanent every one who works a full season or more, while in the other figure all workers were reduced to a full-year basis.

[81] *Regnskabsresultater fra Danske Landbrug i Aaret 1938–39* Det Landokonomiske Driftsbureau [Denmark], p. 103.

close to two and a half times as large as in Denmark. Gabyshev, giving an example of the cost of weaned piglets, stated that feed costs were only 41 percent of the total.[82] While the proportion of feed costs must be considerably higher than that in raising and finishing the weaned piglets, the over-all average for feed costs in hog production is not likely materially to exceed 50 percent.

The high production costs in sovkhozy are apparent from the huge cuts ordered in each five-year plan.[83] Rent and interest, which would accrue if the land and the other investment of the sovkhozy were used by the peasants, of course do not enter into the accounts. The hope that the sovkhozy would become cheap producers was abandoned long ago. It is assumed in chapter xxix that the sovkhozy covered their direct expenses in average years, and yielded a small profit in the favorable year 1937. Even this assumption may be too optimistic.

Conclusion.—It is difficult to decide which of the sovkhozy's shortcomings were decisive in the relegation of this highly favored type of socialized farm to a subordinate position in Soviet agriculture. The disproportion between the investment and deliveries may have been the principal factor, although high production costs also weighed heavily in this decision. The higher productivity per unit of labor in the sovkhozy as compared with the kolkhoz did not arouse enthusiasm or cause even a mild shift toward the sovkhoz enterprise when, in the late 'thirties, labor shortage became rather acute. The extremely cheap labor of the kolkhozniki was too large a counter-attraction. This fact suggests, however, that the superiority of the sovkhozy in labor productivity was not very large.

In the face of such evidence on the status of the sovkhozy around 1938, one is prepared to take with more than the proverbial grain of salt the statement found in place of a title to Table 37 on page 36 of the statistical handbook *Socialist Agriculture USSR, 1938*: "Sovkhozy are the most advanced, modernly equipped agricultural enterprises in the world."

[82] M. Gabyshev, "On Methods of Computing and Analyzing Production Costs of Hogs," *Socialist Agriculture*, May 1939, p. 55.

[83] On the low productivity and high production costs in the sovkhozy, see also Y. Volchenko, Under-Commissar of Sovkhozy USSR, "On Profitableness of Sovkhozy," *Socialist Agriculture*, March 1940, p. 64 ff.

WARTIME AND POSTWAR DEVELOPMENTS

The sovkhozy suffered greatly in World War II. Many were overrun by the enemy, and those in unoccupied territory lost part of their tractors and most of their skilled labor to the war effort. In 1945 the acreages and livestock of the sovkhozy were 40 percent or more below prewar: their hog herds were reduced by about 60 percent.[84]

The decline in wheat, the principal crop of the sovkhozy, was particularly marked. The sovkhozy of the Commissariat of Sovkhozy (after January 1947 the Ministry of Sovkhozy) had only around one million hectares in this crop in 1945, which represented a decline by more than two-thirds. Even the sovkhozy apparently substituted the inferior millet for wheat on a very large scale (see page 216 on the adverse implications of millet growing).

In spite of assertions to the contrary, the 4th Plan's ambition for the sovkhozy is solely to restore them to the prewar level. The determination to place them on an "exemplary footing" (Article 31 of Section II) is pure oratory. It is noteworthy that the February 1947 resolution of the Party begins Section V, "On Improvements in the Operation of the Sovkhozy," thus: "To consider a great shortcoming in the operation of the sovkhozy their excessive specialization . . . ." Diversification, which proves out of reach of the sovkhozy, is now overstressed as much as specialization was in the initial stages.

The portion of the 4th Plan on sovkhozy has the usual shortcoming that the prewar data pertain to a certain extent to the prewar territory, while the 1950 goals are for the postwar territory.[85] All too frequently the Soviet publications blithely compare data for old and new territory, for the sovkhozy of the Commissariat of Sovkhozy and all sovkhozy, not only without adjustment but without mention of changes in bases of comparison.

Below are reproduced from a highly authoritative source the

[84] These percentages are computed from the data of the 4th Plan for the USSR and RSFSR, and the February 1947 decision of the Party.

[85] It also seems that the sovkhozy which once belonged to the Commissariat of Agriculture, and possibly some others, have been transferred to the Ministry of Sovkhozy, but the transfer may have occurred before the war.

1950 goals and the actual 1940 figures on land utilization of the "grain and livestock sovkhozy" (data in thousands hectares), with all the reservations as to comparability:[86]

Item	Actual 1940	Goal 1950
Arable land	10,935	12,000
Clean fallow	2,009	2,100
Cropped plowland	8,926	9,900
Grain	6,286	6,105
Feed	2,375	3,500
Perennial grass	1,325	3,100

If changes in territory are considered, the expected decline in crops other than rotation grass may be somewhat larger than the figures in the tabulation indicate.

With reference to the sovkhoz livestock, the 4th Plan projects that by the end of 1950 the prewar level is to be exceeded by the following percentages: cattle, 16; hogs, 28; sheep and goats, 32. The February 1947 decision of the Party requires that the herds of the Ministry of Sovkhozy be restored to prewar levels by the end of 1949. This implies that to fulfill the 4th Plan, the increases in 1950 must be huge. Actually the February 1947 decision implies huge increases during 1949 also. Probably no one takes those plans seriously.

Of interest is the language in which the sovkhozy—once the cherished child, the big hope, and still state organizations after all—are now addressed:[87]

> The Government greatly helps the sovkhozy with tractors, farm machinery, trucks. The sovkhozy are given priority in obtaining spare parts. The Soviet of Ministers USSR demands from the sovkhozy the honest fulfillment of their obligations toward the state, especially with reference to grain deliveries.

[86] S. F. Demidov, *op. cit.*, p. 94. The writer indeed does not know which sovkhozy are included under "grain and livestock sovkhozy"—the expression used by Demidov.

[87] Leader in *Socialist Agriculture*, Jan. 17, 1947.

CHAPTER XII

MACHINE-TRACTOR STATIONS[1]

FORERUNNERS OF THE MTS

When the speed-up of collectivization was decided upon late in 1927, the USSR had had only negligible experience with the tractor, which was supposed to become the mainstay of collectivized agriculture. In performing field operations with tractors by special organizations for either collectives or individual peasants—the basic organizational form of tractor use in Soviet collectivized farming—the Soviet Union had had no experience whatsoever.

The MTS, or machine-tractor stations, i.e., organizations which *perform* farm operations with their machinery for the peasants' collectives, rather than *lease* the machinery to them, did not come into existence until 1930 when the big collectivization drive was well under way. The early tractor columns operated on the same principle as the MTS, but on a very small scale. Even they did not begin to function until the fall of 1928, antedating the MTS by little more than a year. The experiment of the Shevchenko sovkhoz (p. 271) in performing field operations for large groups of individual peasants and their collectives, which was proclaimed a big success and contributed much to the development of the MTS, did not begin until 1927.

Co-operatives for *lending machinery* to peasants or their co-operatives (machine-lending points) arose a few years before the start of the collectivization drive. They were tiny organizations and in the aggregate they had a negligible number of machines. The co-operatives for *lending tractors* to peasants or their co-operatives came into existence about the same time as the tractor columns, but never attained the slightest significance.

Machine-lending points.—The organization of co-operative machine-lending points was fostered from the time new machinery

[1] The discussion in this chapter is supplemented at various points by that in chapter xix.

began to be available in larger numbers. In the RSFSR the number of such points increased from 4,500 in 1925 to 11,700 in 1929.[2] Many were apparently more or less fictitious, consisting of groups of relatives or including many nominal members. These were established simply to take advantage of the fact that by forming a point it was easy to obtain machinery from the state factories or import organizations, and on such favorable terms as payment in six years with no down payment.

How small the points were is obvious from the fact that the gross return of those investigated in 1928 averaged 1,063 rubles.[3] In that year, all points of the RSFSR had only 500 tractors, while more than three times as many were privately owned by the peasants.[4]

The charges for the use of the machinery were very moderate. In spite of this, the machinery of the organizations was little used and the points investigated operated at a considerable loss, with expenses averaging 1,461 rubles as against gross receipts of 1,063 rubles.[5]

Most distressing from the Party viewpoint, though quite natural, was the fact that the percentage of households borrowing machinery from the points rose rapidly from the lowest to the highest groups. Galevius summed up these findings of his survey in these words: "The described situation with reference to the lending of machinery is in sharp contrast with our basic line of socialist construction."[6] The beginning of the end of the machine-lending points came in 1929 or thereabouts, chiefly through merger into tractor columns or MTS.

Tractor columns.—An important role was claimed for the tractor columns in the technical reorganization of peasant farming and in the fostering of mass co-operation and collectivization.[7] In fact, only 13 operated in the fall of 1928; their number was increased to 56, with a total of 1,496 small tractors, in the spring of 1929; during that spring, 61,980 hectares were plowed and 72,209 hectares seeded by them.[8]

[2] F. Galevius, "Machine-Renting Points and Their Role in the Socialist Reconstruction of Agriculture," *Economic Review*, December 1929, p. 153. [3] *Ibid.*, p. 160.
[4] *Ibid.*, p. 156. [5] *Ibid.*, p. 160. [6] *Ibid.*, p. 162.
[7] I. Kuznetsov, "Preliminary Results of the Kontraktatsiya of Spring Crops," *Economic Review*, June 1929, p. 98. [8] *Ibid.*

The MTS of the Shevchenko sovkhoz.—The experiment of the Shevchenko sovkhoz, located in the Odessa area, was conducted under the auspices of the Ukrainian Union of Sovkhozy. The results created a great sensation. Written up by Markevich, they were published by the Gosplan USSR with an enthusiastic preface by G. M. Krzhizhanovskii, at that time president of the Gosplan. The experiment was started in 1927; Markevich's book was dated 1929.[9]

The station of the Shevchenko sovkhoz served 26 villages with 24,000 hectares of land, but was intended to serve in the future 50,000 to 60,000 hectares.[10] Markevich insisted that the participation of the peasants was absolutely voluntary, and in his opinion it should always be so. Each village (or part of a village, if not all dwellers agreed to participate) formed a unit, which was served by a separate group of machines from the station.[11]

Three-bottom plows, harrows, ten-foot binders, and corresponding threshers were pulled or propelled by the International 10/20,[12] classed as a two-plow tractor in the United States. Markevich objected to the use of the combine because of the loss of the straw and chaff which, in his opinion, are more important to the peasants than the grain.[13] Fuel, lubricants, and extensive direction were provided by the station.[14] All labor, except that of the agronomists and of one skilled mechanic for each village, was supplied by the peasants in proportion to their share in the land pooled for operations with the Shevchenko machines. The removal of straw and chaff from the field, as well as the cultivation and harvesting of the row crops, were likewise performed by the peasants with their own workstock or by hand. One-quarter of the harvest from the fallowed land and one-third of that of other crops were paid in kind to the sovkhoz for its services. All straw and chaff went to the peasants along with their

[9] A. M. Markevich, *Inter-Village Machine-Tractor Stations* (Moscow, 1929).

[10] *Ibid.*, p. 35. Data for 1928. In 1929 the area serviced was actually raised to 50,000 hectares. See V. Venzher, "The Development of Machine-Tractor Stations," *Socialist Agriculture*, November 1947, pp. 16–17.

[11] Markevich, *op. cit.*, pp. 36 and 41.

[12] *Ibid.*, pp. 75–76.

[13] *Ibid.*, p. 84.

[14] *Ibid.*, pp. 50–56.

share in the crops.[15] The livestock husbandry remained on an individual basis for the time.[16]

Markevich displayed considerable practical knowledge and ingenuity, along with a great deal of backwardness. What he believed to be the most advanced practices of American "wheat factories" at that time had been obsolete for several years. Had he been adequately informed, he would at least have planned the future work of his MTS on the International 15/30, or even larger models, rather than on the International 10/20. He knew of the existence of the row-crop tractor, but failed to make plans for using it.

Markevich claimed that the operations of the Shevchenko MTS raised the yields of grain by 3.0–3.5 quintals per hectare. The claim obviously could not have been based on the experience of the one full season the station operated before publication of his book. Indeed, neither the kolkhozy served by the MTS nor the sovkhozy themselves ever even approached yields exceeding by 3.0–3.5 quintals those obtained by individual peasants before the collectivization drive (for sovkhoz yields see p. 260; for all producers, p. 549). Yet the claim not only was accepted by the Party but was favorably commented upon by the Gosplan[17] and used as the basis of large-scale plans.

Having accepted the yield-raising feature, the planners could reasonably insist that the arrangement of the Shevchenko MTS with the peasants was profitable not only to the state but to the peasants as well. Since the peasants had to retain a large part of their workstock, they certainly did not save the equivalent in value of one-quarter of the grain crops on fallowed land and one-third of their other crops, as a result of their arrangement with the MTS. Moreover, the peasants are not likely to have been lured by expectations of greatly increased yields. The indirect inducements for the peasants to participate may have played a role in their decision. The participants in the Shevchenko enterprise in each village generally formed a co-operative, a TOZ (see next chapter), and this entitled them to a discount on their

[15] Markevich, *op. cit.*, pp. 299–300.

[16] *Ibid.*, p. 62.

[17] *1st Plan*, II, Part 1, p. 270.

agricultural tax. The principal reason for joining may well have been that the territory involved in the Shevchenko experiment belonged to the few where land held by the peasants was relatively abundant or the peasants may have lacked sufficient draft power of their own. The arrangement with the station, if it really was entirely voluntary, probably permitted the peasants to have more land under cultivation immediately than they would have been able to handle with the workstock in their possession at that time.

EARLY EXPERIENCE WITH MTS

The birth of the MTS proper dates from an order of the government of June 5, 1929.[18] Accepting the positive results of the operations of the Shevchenko sovkhoz station, the order prescribed mass organization of the MTS at the outset. The establishment of the Tractor Center, the co-operative organization which was to unite the MTS, was approved by a decision of the Party of November 17, 1929.[19] The scale of operations envisaged for the MTS was modest at the start. Thus the order of June 5, 1929 prescribed that by the end of the first year (September 1930) one million hectares of kolkhoz cropped plowland should be serviced by the MTS. But the new move rapidly gained momentum and unlimited expansion of the MTS soon became the objective.

Extreme scarcity of tractors, however, proved a great handicap. An attempt was made to overcome this obstacle by having the MTS use horses to a considerable extent as well as tractors. An order of the Council of Labor and Defense, for example, specified that the MTS united in the Tractor Center were to work 3.5 million hectares of kolkhoz cropped plowland in 1930, on half of which horses were to be used.[20] But nothing came of the latter.

The MTS began functioning in February 1930.[21] In mid-

[18] D. Shepilov, "The Kolkhoz System of USSR," *Problems of Economics*, January 1941, p. 33.

[19] *Laws on Collectivization of Agriculture and the Struggle for the Harvest*, compiled by A. Bodyako and S. Zaitsev (Moscow, 1930), p. 6.

[20] *Ibid.*, p. 156.

[21] *Control Figures of the National Economy USSR for 1929–30*, Gosplan (Moscow, 1930), p. 125.

1930 only 158 MTS were in operation (Table 22). However, by greatly expanding the imports and pushing the domestic production of tractors, and by appropriating tractors from machine-

TABLE 22.—MTS: CERTAIN PERTINENT DATA, 1930–40*

Year[a]	Number of MTS	Tractors (*thousand drawbar h.p.*)	Combines (*thousand*)	Trucks (*thousand*)	Tractor work (*in terms of standard plowing, million hectares*)[b]	Combine harvesting (*percent of total grain acreage*)	Kolkhoz cropped plowland serviced (*percent of total*)
1930.....	158	87	0	0.1	....	0	....
1931.....	1,228	681	0.1	1.0	....	0	37.1
1932.....	2,446	1,077	2.2	6.0	20.5	0	49.3
1933.....	2,916	1,758	10.4	12.3	35.2	0.7	58.7
1934.....	3,533	2,754	15.2	19.5	62.5	1.9	63.9
1935.....	4,375	4,282	29.3	27.8	100.5	6.9	72.4
1936.....	5,000	5,856	64.9	43.2	164.6	21.3	82.8
1937.....	5,818	6,679	104.9	60.3	202.8	33.7	91.2
1938.....	6,358	7,437	127.2	74.6	206.2	...	93.3
1939.....	6,498[c]	.....	141	...	210.7[d]	...	94.2
1940.....	6,693[c]	8,292[c]	148[e]	40.0[f]	211.3[d]	43[g]	94.5

* From official and semiofficial sources, largely from *MTS in the 2d Stalin Five-Year Period* (Moscow, 1939), p. 11. Data for 1940 mostly pertain to enlarged territory. Dots (...) indicate data not available.

[a] The number of MTS, tractor horsepower, combines, and trucks are as of June 1 for 1930 and 1931, and December 31 for 1932 through 1938. For 1939 and 1940 the date was not always clearly stated.

[b] Excluding threshing with stationary thresher.

[c] T. S. Matushkin, *Analysis of the Economic Activities of the MTS* (Moscow, 1947), p. 151. S. F. Demidov (*Development of Agriculture in the Postwar Five-Year Period*, Moscow, 1946, p. 162) gave the number of MTS for 1940 at 7,069; D. Shepilov ("Kolkhoz System of the USSR," *Problems of Economics*, January 1941, p. 35), gave it at 6,980, pointing out that the figure included the "western oblasti of the Ukraine and White Russia." The difference between Matushkin's figure and those of the others indicates 300 to 350 MTS in the new territories. Matushkin's figure for the power of tractors in 1940, on the other hand, is higher than those given by others and may pertain to the enlarged territory.

[d] N. Anisimov, *Agriculture in the New Stalin Five-Year Period* (Moscow, 1946), p. 72.

[e] Another source gave 153,000.

[f] V. Khalturin, "On Organization and Management of the MTS," *Machine-Tractor Station*, March 1946, p. 14.

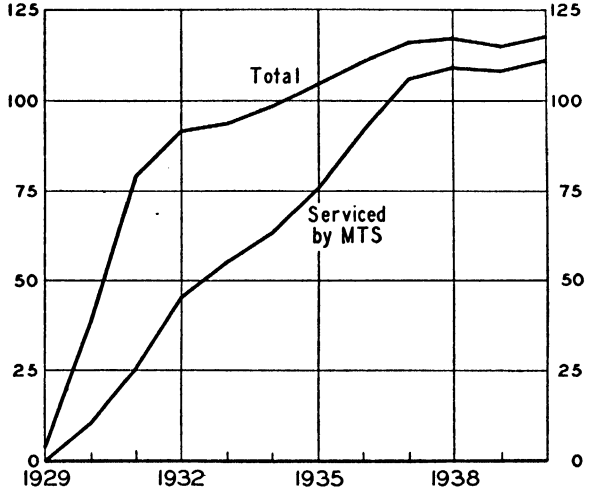
[g] S. F. Demidov, *op. cit.*, p. 163. His figure pertains to MTS and sovkhozy.

lending points and kolkhozy, the organization of the new MTS was amazingly accelerated. Rapid as the expansion was, it could not keep up with the rate of collectivization. In 1930 and 1931 one-quarter and one-third of the cropped plowland of the kolkhozy were serviced by MTS (Chart 21), and serviced very unsatisfactorily at that. In 1932 the total work performed by the

MTS, usually with great delays, was equivalent to only 1.1 hectare of standard plowing per hectare of cropped plowland of the kolkhozy served by them (a hectare of standard plowing represents about three hours of work by a 15-horsepower tractor; see p. 466 concerning this unit of measurement).

Fundamental changes occurred in the organization of the MTS during the first years after their birth. These included changes in tractor types, a great increase in average size of the MTS, and the transfer of MTS from peasant to state ownership.

CHART 21.—KOLKHOZ PLOWLAND: TOTAL AREA AND AREA SERVICED BY MTS*
(*Million hectares*)



* Data in Chart Appendix.

Furthermore the MTS practice, originally permitted, of serving individual peasants[22] (a concession of little practical significance, owing to the limited resources of the MTS) was later prohibited for political reasons.

Changes in tractor types.—As the Shevchenko sovkhoz had operated on peasants' fields, and indeed on its own, with only two-plow tractors pulling three-bottom plows, the MTS were forced to do likewise in the beginning. This disadvantage was also troublesome for the clumsy MTS. At the end of 1931 the MTS had 21,889 Fordsons of foreign and domestic make,

[22] Decision of the Party released in *Pravda*, Jan. 1, 1930.

13,029 International 10/20's, and a number of other two-plow tractors in their total of only 56,714.[23]

The shift to a real three-plow tractor (the International 15/30 produced in Stalingrad and Kharkov) and the later addition of a great number of large crawlers with a sprinkling of row-crop tractors are described in some detail on pp. 463–64. The change-over to the larger tractors considerably simplified the operations of the MTS and noticeably reduced their costs. The principal advantage of large tractors, however, is in the saving of labor, and most of this was and is provided by the kolkhozy.

The shift to large crawlers was overdone. At the beginning of the war there were too many of them and too few row-crop tractors in relation to the need for the two types. The ensuing disadvantages are discussed below, as well as on page 464.

Enlargement.—A considerable enlargement of the individual organizations providing the peasantry with machinery had begun with the birth of the tractor column, the predecessor of the MTS. An order of the Commissariat of Agriculture RSFSR of March 25, 1929 fixed the minimum size of a column at twenty-five 10/20 tractors or 250 drawbar horsepower, and a much larger size was declared desirable.[24] In 1932 the tractors of the MTS averaged 443 drawbar horsepower per station. The 2d Plan called for an increase in the average number of tractors per MTS from the equivalent of 30 units with 15 drawbar horsepower each to 65–70.[25] This objective was quickly met and exceeded; the average reached 66 in 1935 and 76.6 in 1937. The actual increase was even greater than the figures indicate, because the new MTS were located more and more in areas particularly unadapted to large-scale production and normally had about half as many tractors per station as the MTS in the steppe areas (see Table 23, p. 282).

The reason frequently given for the concentration of the tractors in a small number of MTS was that it permitted maximum utilization of the tractors. This was very urgent in the early years of the collectivization drive because of the great

[23] I. B. Angern in *Socialist Reconstruction of Agriculture*, November-December 1932, p. 73.

[24] *Laws on Collectivization of Agriculture . . . .*, p. 159.

[25] *2d Plan*, I, 213–14.

decline in animal draft power. But the assertion that the kolkhozy were unable even to approximate complete utilization of the tractors had little truth in it from the very start. Tractors in kolkhozy averaged the unexpectedly large number of 1,230 hours per year in 1928.[26] While this was substantially less than the 2,230 hours which the MTS of the Tractor Center attained with their few tractors in 1930,[27] it exceeded the approximately one thousand hours shown by the MTS tractors in 1932 (implied in the data of Table 22, p. 274), and was practically on a par with later attainments of the MTS. Moreover, the enlargement of the kolkhozy on the average to more than ten times their former size as part of the big collectivization drive (see pages 315–19) removed whatever obstacles existed to full utilization of the tractors by individual kolkhozy. Indeed, it has become common practice, at least in the steppe areas, for the MTS to assign a small group of tractors (MTS brigade) to the exclusive use of one kolkhoz. Basyuk's authoritative study even suggests that such assignment should be made for several years.[28] Another advantage claimed for large MTS is that they provide technical supervision, but such supervision could be supplied by an appropriate agency to kolkhozy that owned tractors.

A circumstance that favored large MTS was the difficulty of finding a sufficient number of suitable persons for directors. But this was simply a result of the fact that the USSR was not ready for the whole undertaking. Actually the facility with which operations of the MTS could be controlled from the top was a much more important reason for their large size than was their efficiency of operation. It was, indeed, the decisive factor.

After the prolonged drive for larger and larger MTS, complaints of their clumsiness began to arise.[29] A de-enlargement of the MTS was ordered by the 3d Plan, but unlike the enlargements the resulting cutback was inconsequential—from 76.6 units of 15 horsepower per MTS in 1937 to 74.9 in 1940.

Change in ownership.—The drive for the organization of MTS started with no idea of departing from the firmly established

[26] Venzher, *op. cit.*, p. 18.
[27] *Ibid.* In 1929 the tractors of the MTS of the Grain Center averaged 1,814 hours.
[28] T. L. Basyuk, *Organization of Kolkhoz Production* (Moscow, 1946), pp. 138–42.
[29] See, for example, *Pravda*, Feb. 21, 1939.

system in which the organizations lending machinery to the peasants or performing their farm operations were the property of the peasants or their co-operatives. The Party decision of January 5, 1930 stated the objective: ". . . . to obligate the peasants to pay the value of the [machine-tractor] stations in three years."[30] Very significantly, the peasants as such, rather than the kolkhozy or their respective centers (the Tractor Center), were made responsible for the payment and hence were considered owners of the machinery. By the order of February 1, 1930, the organization of an MTS could not be started until the peasants had paid in at least 25 percent of its total costs.[31] Before that, on December 30, 1929, the government had permitted the sale of special bonds, the payments for which would serve as deposits for acquisition of domestic and imported tractors.[32] On February 13, 1930, a special Loan for Fostering Tractorization of Agriculture was authorized by the Party and government.[33] The holders of the loans were entitled to buy tractors outside of the plan and pay for them with the bonds.

In December 1930, however, the man who was largely responsible for the agricultural part of the 1st Plan wrote:

> The year 1931 will be the turning point in the tractor economy of the kolkhozy. From this year the spreading of the tractors in small groups in the kolkhozy will be discontinued, and all tractors intended for the kolkhozy will be turned over to the Tractor Center. The tractor park of the MTS will be formed not only from new tractors, but also from those tractors taken by the Tractor Center which had been operated by the Khlebotsentr [Grain Center] and by individual kolkhozy.[34]

Taking away the kolkhoz tractors and also the machinery used with them was a threatening act; but the Tractor Center, to which the tractors had to be turned over, remained at least in name an agency of the kolkhozy and consequently of the peasants. Thus the measure could be interpreted as one of enlargement.

The measure thus discussed by Wolf turned out to be only the first step. Even the Tractor Center was soon officially considered

[30] *Most Important Decisions on Agriculture* (2d ed.), p. 412.
[31] *Laws on Collectivization of Agriculture . . . .*, p. 156.
[32] *Ibid.*, pp. 165–67. [33] *Ibid.*, pp. 234–35.
[34] M. Wolf, "Plan of Socialist Reconstruction of Agriculture for 1931," *Planned Economy*, December 1930, p. 162.

out of place, and the producers were deprived of even a semblance of ownership of the principal means of production. In 1931 the MTS became joint enterprises of the state and kolkhozy, and in 1932 they were made purely government institutions.[35] The final removal of all tractors and most of the machinery from the kolkhozy to the MTS took place in 1934.

The order of the government and Party on the 1940 harvest and procurements, dated August 1, 1940, was issued when shortage of machinery could not possibly be given as a reason for concentrating machinery in large units. It prescribed that all new binders of all types, as well as all new grain mowers, even the most primitive ones without attachments for removing the cut grain from the platform, intended for kolkhoz work, should be handed over exclusively to the MTS.[36] Since the kolkhozy had hitherto owned practically all horse-drawn machinery, including all mowers and part of the binders, the new order implied a further restriction upon the ownership of machinery by the kolkhozy.

The fundamental objective of the collectivization drive was to obtain a large part of the kolkhoz output, regardless of the size of the crop or the needs of the kolkhoz members. Those in power were not too hopeful that the kolkhozy would be the means of creating an abundance of farm products. The deliveries had to be insured through pumping of the farm products from the kolkhozy, and the MTS had to play a big role as the pumpers. Yakovlev, the leading man in agriculture at that time, said in his report to the Central Committee of the Party, in June 1931:

> The second point requiring emphasis is that the MTS are not only organizers of the work but the deliverers of the produce. There are not and should not be any intermediaries between the state and the MTS in this respect.[37]

On an earlier occasion he had used even stronger words:

> The first, principal, basic problem is that of fulfillment by the MTS of their obligations with reference to the deliveries to the state.

[35] *The Development of Soviet Economy*, Economic Institute of the Academy of Sciences (Moscow, 1940), p. 384, quoted in Gregory Bienstock, Solomon Schwarz, and Aaron Yugov, *Management in Russian Industry and Agriculture* (New York, 1944), p. 135.

[36] *Most Important Decisions on Agriculture of 1938–40* (Moscow, 1940), p. 105.

[37] Y. A. Yakovlev, *Problems of Organization of Socialist Agriculture* (Moscow, 1933), p. 185.

The proletarian state will be ruthless toward such leaders and workers of the MTS [those who neglect the deliveries].[38]

The political bureaus.—Even the enlargement of the MTS and the change in their ownership did not do the whole trick. A special order of the Party and government of January 11, 1933 prescribed that each MTS should have a political bureau, the head of which would hold the position of vice-director of the MTS. The order stated:

The duty of the first order of the politbureau is to assure complete and timely fulfillment by the kolkhozy and kolkhozniki of all their obligations toward the state, especially the determined struggle against the theft of kolkhoz property, the combating of sabotage of orders of the Party and Government with reference to the procurements of grain and meat.[39]

By a decision of the Party of November 28, 1934, the political bureaus of the MTS became regular party institutions.[40] However, an assistant director for political work had to be appointed in each MTS, who "being directly subordinated to the director of the MTS, has simultaneously to take orders from the raion party committee under whose guidance he performs his party-political work." At some later date, probably during the war, this job was abolished; but it was restored by the Party decision of February 1947.

THE MTS AS MATURE INSTITUTIONS

As they have finally emerged after all reorganizations, the MTS are state institutions which "perform with their tractors and farm machinery and implements" the principal draft-power operations (with significant exceptions) for the kolkhozy. The workstock and the implements used with it have remained the property of the kolkhozy (see, however, p. 279). The MTS supply the fuel and lubricants for the tractors and combines and attend to the repair of all machinery. The tractor drivers are appointed by the MTS, but most of them are paid almost entirely by the kolkhozy, which also supply all the auxiliary labor.

The principal equipment of the MTS is shown in Table 22,

[38] Yakovlev's speech at the meeting of the directors of flax sovkhozy, Dec. 10, 1930.

[39] *Most Important Decisions on Agriculture* (2d ed.), p. 170.

[40] *Ibid.*, p. 198.

p. 274. While one would expect a repair shop in each MTS, in the beginning of 1938 only 3,731 MTS out of a total of 5,819 had regular repair shops (the so-called MTM); 1,200 repair shops were doing capital maintenance as well as current repairs.[41] By 1941 the number of MTS without shops for current repairs had been reduced to 15 percent of the total.

During World War II, the MTS lost a large part of their equipment through obsolescence and destruction. According to Andreev's report of February 1947, they had 6 million horsepower in tractors at the beginning of 1947—a decline by one-quarter from prewar; but practically every tractor still in use was either obsolete or nearly so. As to combines the situation was even worse, especially because it seems more difficult than in the case of tractors to maintain over-age or near-obsolete machines in working condition, even by frequent complete overhauls.

The investment in the means of production of the MTS at the beginning of 1938 was equivalent to 5.6 billion current rubles, the same as that reported for the sovkhozy. Actually, however, the investment in the MTS was considerably smaller, for it consisted to a much greater extent of highly overvalued tractors, trucks, and similar equipment than did the investment of the sovkhozy (see pages 617–18). The significant fact that the investment in the MTS was increasing much more rapidly than that of the sovkhozy was emphasized in the preceding chapter.

An MTS with the equivalent of seventy 15-horsepower tractors in 1938 serviced 18,500 hectares of cropped plowland belonging to slightly more than 30 kolkhozy. In 1937 a total of 488 hectares of standard plowing (including equivalents in threshing) was done per 15-horsepower tractor,[42] and 317 hectares were harvested per 15-foot combine. But those are over-all averages, and the regional variations are so large that the averages are almost meaningless.

In the areas most adapted to the use of tractors and combines,

[41] Aiche's report to the Central Committee of the Party, Jan. 18, 1938.

[42] All operations of tractors are reduced to "standard plowing" in the USSR (see p. 466). A hectare of standard plowing requires a little less than three hours work of such a tractor.

represented in Table 23 by North Caucasus and Crimea and the Middle and Lower Volga regions, each MTS served only 13 to 14 kolkhozy in 1938, but each group of kolkhozy averaged more than 20,000 hectares of cropped plowland.[43] Over 500 hectares

TABLE 23.—MTS: PERTINENT DATA FOR SPECIFIED REGIONS, 1937*

Region	Kolkhozy served per MTS (*number*)	Cropped plowland serviced per MTS (*hectares*)	Tractors			Combines		Trucks: Number per MTS
			Number per MTS (*units of 15 h.p.*)	Average size (*h.p.*)	Standard plowing per 15-h.p. unit (*hectares*)	Number per MTS	Hectares harvested per unit	
USSR	33	18,510	78	18.3	488	18.4	317	10.5
North Caucasus and Crimea ...	14	21,031	84	18.9	640	26.5	377	10.7
Middle and Lower Volga..	13	21,984	97	19.2	520	29.3	396	8.8
West Siberia ...	24	17,083	86	20.7	425	25.8	288	12.0
White Russia ...	41	13,077	42	17.2	355	3.2	136	2.9
European North.	45	7,957	44	18.1	257	2.9	217	3.2
Uzbek	50	13,065	107	14.3	392	6.6	263	9.0
Georgia	41	11,020	49	16.5	364	5.1	221	7.7

* *MTS in the 2d Stalin Five-Year Period*, pp. 127–29.

of standard plowing was done per 15-horsepower tractor, and almost 400 hectares were harvested per combine in those areas in the same year.

In the European North, the area least adapted to the tractor and combine, there was but one MTS to 45 kolkhozy, yet each serviced less than half as much cropped plowland as the average MTS of the country as a whole. Furthermore, the amount of work done per tractor there in that year was little more than half of the country's average. It is not surprising that the average cost per hectare of standard plowing to the MTS was almost 60 percent higher in the non-Chernozem zone than in the steppe areas of European Russia.[44]

[43] Detailed data for later years are not available, but only slight changes occurred in 1938–40 and also later.

[44] Data for 1939; see M. Moiseev, "On the System of Machinery in Agriculture," *Socialist Agriculture*, January 1941, p. 43. Animal power is also more expensive in the non-Chernozem zone, but not necessarily by as much as 60 percent. While the MTS of this zone are unable to use their tractors as many hours per year as the MTS of the steppe areas, the number of hours per work animal per year is large in the non-Chernozem zone, owing to the more diversified crop production and the opportunity for forestry work in the winter.

Data on the MTS in West Siberia appear less favorable than on those of the Volga region, owing probably to the particularly short growing season. Each MTS in West Siberia served nearly twice as many kolkhozy but only about three-fourths as much cropped plowland as those in the Volga region. The performances per tractor and combine also were considerably below those of the steppe areas of European Russia.

White Russia resembles the European North, but the MTS do somewhat better there. In number of kolkhozy and the area of cropped plowland served, and in performance per tractor, the MTS of the special areas represented in Table 23 by Uzbek and Georgia show results similar to those of White Russia.

Personnel.—The director of the MTS is appointed by the Minister of Agriculture of the USSR. The operational unit of the MTS is a brigade built around a few tractors. The brigade personnel includes a brigadier, his assistant, fuel controller, guard, cook, and possibly another general worker in addition to the machine operators. Each tractor is served by two drivers, two to four assistants (hitchmen), and sometimes another man with a horse and wagon.[45]

The tractor drivers are appointed by the MTS, but most of them are paid almost entirely by the kolkhozy. The brigadiers and their assistants were given the option by the order of September 21, 1933 to be fully on the payroll of the MTS and all of them apparently made use of the option. The orders of March 8, 1939 and January 17, 1940, however, placed them on the same footing as tractor drivers. The difference after all may have been merely a formality. The kolkhozy probably had to reimburse the MTS for the outlay on them even prior to the order of March 8, 1939.

The operators of combines, threshers, and other more complicated harvesting or processing machines are supplied and paid by the MTS. The personnel of the MTS itself includes, in addition to those named, the administration, agronomists, and mechanics. In winter the operators of combines, threshers, and

[45] T. L. Basyuk, *op. cit.*, p. 139, and other sources, especially the description of the Protochnaya MTS, Krasnodar oblast, in *Socialist Agriculture*, November 1939, p. 41. According to Basyuk, there are two hitchmen for a wheel tractor and four for a crawler.

other machines are used by the MTS on repair work. The accompanying tabulation gives the number and organization of MTS personnel at the beginning of 1938.[46]

Total personnel		*1,402,949*
Tractor drivers		685,016
Those paid by the MTS	40,371	
Tractor brigadiers		95,832
Agronomists		32,592
Mechanics, etc.		40,026
Workers		450,995
Repair workers	99,423	
Truck and automobile drivers	56,079	
Combine operators	82,413	
Other workers	213,080	
Other personnel		98,488

Thus the tractor drivers made up nearly half of the total, and with the tractor brigadiers more than half. Nothing is said in the source about administration. The rather substantial figure for "other personnel" in the tabulation is obtained as a residual. It is probably made up entirely of administrative employees; their large numbers may have made it desirable to avoid mentioning them specifically.

Until January 1, 1939 the tractor drivers, although appointed by the director of the MTS, at the full disposal of the MTS, and independent of the kolkhozy, received their entire pay from the kolkhozy. After that date the MTS took over a small part of the payment of the tractor drivers. Like the ordinary kolkhozniki, the tractor drivers are paid in trudodni (see pp. 403–04), but their pay is greatly in excess of the pay of horse drivers although their work is not so hard.

By the order of the government and Party of March 8, 1939, "On Norms of Work and Payment of Tractor Drivers," as amended on January 17, 1940 and apparently still broadly in force, the drivers of row-crop tractors, Internationals, and crawlers receive, respectively, 4.0, 4.5, and 5.0 trudodni for fulfilling the shift norm.[47] First-class drivers (there are two classes), after a year with the same MTS, receive 10 percent

[46] *MTS in the 2d Stalin Five-Year Plan Period*, pp. 90–91.
[47] *Most Important Decisions on Agriculture of 1938–40*, pp. 169–74.

more. Further payments are 50 percent extra for overtime and double for harrowing and seeding in the first six days of the spring campaign. Premiums are paid for exceeding shift norms[48] and fulfilling seasonal norms, and for economical use of fuel and lubricants. The kolkhoz provides food to the drivers during work at prices charged by the state or co-operatives. The drivers are paid only for work done; they are not paid for time lost in stoppages, whatever the cause, or spent in driving the tractors from the MTS to the kolkhoz fields.

The brigadiers of the tractor brigade and their assistants receive 30 and 20 percent more trudodni respectively than the average tractor driver in their brigade. In addition, both groups are entitled to certain premiums that drivers do not get.

For a trudoden the tractor drivers, brigadiers, and assistant brigadiers are guaranteed a minimum of 2.50 rubles and 3 kilograms of food grain.[49] Prior to January 1, 1939 the kolkhoz had paid the 2.50 rubles, but an order of the government and Party of January 13, 1939 made this payment the obligation of the MTS.[50] By the resolution of the Party of February 1947, the minimum food grain payment is reduced from 3 to 2 kilograms in case the planned yields are not reached.

In addition to their guaranteed payments, the above-mentioned workers receive a share, on the same basis as other kolkhozniki, of all other products distributed by the kolkhozy where the work was performed, as well as of any excess of food grain and money (over their basic 3 kilograms and 2.5 rubles per trudoden) that might be available for distribution to those kolkhozniki.

Controllers of fuel are also paid by the kolkhozy at the rate of 2 trudodni per day, and are guaranteed 3 kilograms of food grain per trudoden (or, since 1947, 2 kilograms if the planned

[48] The established premiums for exceeding the shift norm (up to double for exceeding it by more than 50 percent) are somewhat puzzling. For example, the norm for plowing with the International 15/30 to a depth of 10 inches for sugar beets in Kiev oblast was set at 2.8 hectares or 7 acres. It is hard to believe that 10.5 acres of such plowing anywhere could possibly be done per shift, unless the stated depth of plowing was not taken literally (see pp. 436–38). The normal day's performance of such a tractor in the United States is 12 acres, but to a depth hardly exceeding 5 inches.

[49] These payments had already been provided for by a government order of Sept. 21, 1933. See *Most Important Decisions on Agriculture* (2d ed.), p. 210.

[50] *Most Important Decisions on Agriculture of 1938–40*, p. 169.

yield is not fulfilled). The second man on the tractor (called a hitchman) receives half as many trudodni as the driver, but is not guaranteed a minimum of grain.

Tractor drivers and brigadiers of tractor brigades and their assistants, who work in kolkhozy of the areas growing cotton under irrigation, are fully paid by the MTS.

Operations.—Only 6 percent of the kolkhoz cropped plowland was not serviced by the MTS in 1940. Regional variations, however, were relatively large, with servicing most nearly complete in the steppe areas of European Russia. According to 1937 data the MTS serviced 99.1 percent of the kolkhoz cropped plowland in Lower and Middle Volga, 98.8 percent in the Ukraine, and 98.4 percent in North Caucasus and Crimea. At the other end of the scale were South Caucasus, Tadzhik, and the European North, where the percentages ranged from 42.0 to 65.2.[51]

The MTS perform the operations for the kolkhozy on the basis of special contracts with each kolkhoz. But the fundamental requirement for a contract, that there be at least two approximately independent parties, is lacking. The contracts between the MTS and kolkhozy display a strong tendency to become pieces of paper, despite all government and Party demands. The February 1947 decision of the Party ordered the restoration in full of the "validity of the contracts between MTS and the kolkhozy they serve, which determine the mutual obligations of the MTS and kolkhozy." The article by Benediktov, the Minister of Agriculture USSR, on "Fundamental Improvements in the Work of the MTS,"[52] which is easily mistaken for an order and in substance does not differ from an order, devoted one of its four sections to measures to raise these contracts to an important position. The section was indeed entitled: "The contract between MTS and kolkhozy has the force of law."

Owing to the stupendous initial deficiencies, the MTS were able to show considerable improvement as time passed. With the great increase in available tractor power, both timeliness and quality of work improved. The increase in the utilization of

[51] *Kolkhozy in the 2d Stalin Five-Year Period* (Moscow, 1939), p. 26.
[52] I. A. Benediktov, in *Socialist Agriculture*, April 24, 1947.

tractors from 406 to 488 hectares of standard plowing (including threshing) per 15-horsepower tractor from 1933 to 1937 was also a positive factor, because it occurred simultaneously with an increase in the timeliness of the operations. The consumption of motor fuel per hectare of standard plowing declined from 27.1 kilograms in 1933 to 20.6 in 1935 and 18.3 in 1937.[53] While part of this large saving was caused by the shift to crawlers in general, and especially to diesel-powered crawlers, it was to some extent the result of increasing efficiency and better care on the part of the personnel. However, the level attained in operations of the MTS in 1937 and succeeding prewar years was by no means satisfactory.

The total number of tractors was inadequate to perform all the operations that could not be conveniently performed with horses. Also, there were relatively too many large tractors, while the number of row-crop tractors was almost negligible. Where both tractors and animal power are available, the tractors normally do the heavy work, leaving the light operations to animal power, so far as seasonal requirements for the various operations permit. This division, however, aside from being handicapped in the USSR by the excessive proportion of large tractors, does not function well under the dual ownership of the two sources of power by the MTS and kolkhozy, especially since the MTS is the far stronger partner in the common job of doing the kolkhoz work.

The deplorable situation in haying in the kolkhozy before the war, resulting from the facts that the MTS did not participate in it to any significant extent and that the kolkhozy were unable to handle it in full and especially at the proper time, is discussed on pp. 468–69 and 613. The ineffectual attempt to combat this evil with 950 special hay detachments, prescribed for the MTS in 1939, is also mentioned. But haying was only outstanding among the operations that were not performed by the MTS and were handled unsatisfactorily by the kolkhozy.[54]

Even the operations which they undertook the MTS did

[53] *MTS in the 2d Stalin Five-Year Plan Period*, pp. 107 and 114.

[54] In haying and in the harvesting of potatoes and flax of the kolkhozy in 1938, tractors (i.e., the MTS) participated to the extent of less than one percent. See S. Matskevich, "Power Balance in Soviet Agriculture," *Planned Economy*, December 1940, p. 63.

neither well nor on time. It will be shown that payment for services of the MTS depended to a considerable extent on the outturn of the crops. Conditions were such, however, that this arrangement failed to stimulate interest on the part of the MTS in the outturn. The number of hectares of standard plowing performed per tractor was by far the most important measure of efficiency of the MTS; fuel consumption was next, but was only minor.

The services of the MTS deteriorated seriously during the war. With the first shot, industry discontinued supplying spare parts and the machinery of the MTS and sovkhozy was crippled at once. In 1943 a big spare-part drive was inaugurated. Yet in 1944, with numbers greatly reduced, the remaining tractors were able to perform only at an average of 241 hectares of standard plowing per 15-horsepower tractor[55] as against 411 in 1940. With the critical shortage of draft power, this meant that the tractors operated when they were in condition rather than when the work was needed. The decline in total performance of combines was even greater.

The subsequent improvement in the operations of the MTS raised the work output to 348 hectares of standard plowing per 15-horsepower tractor in 1946. Total standard plowing in 1946 was estimated at around 140 million hectares as against 211 million in 1940. Harvesting per combine in 1946 amounted to only 142 hectares compared with 317 in 1937, and the total acreage so harvested was only about one-third of the prewar level.

For years complaints have been made that the MTS pay no attention to the importance of specific operations and to performing operations at appropriate times; that they neglect operations having low equivalents in hectares of standard plowing and concentrate on those with high equivalents; that while plans for the former remain unfulfilled by wide margins, the plans for the latter are overfulfilled;[56] that operations are performed badly; and that many are entirely useless.

These complaints had become particularly loud by 1947.

[55] I. A. Benediktov in *Socialist Agriculture*, Jan. 1, 1946.

[56] It is surprising that even a correct appraisal of all operations in standard plowing has not succeeded thus far.

The work of the MTS had certainly deteriorated during the war, but official pronouncements and other evidence leave no doubt that this was not a specifically wartime phenomenon.[57] The very title of the previously cited article of the Minister of Agriculture, "Fundamental Improvements in the Work of the MTS," indicates that the drawbacks are not minor. Benediktov, the minister, wrote: "A fundamental reorganization of the whole functioning of the MTS is involved, a sharp turn of their workers to the problem of striving for a large harvest." Furthermore: "We need work of the MTS that will be fundamentally different in quality from the work of past years and considerably better than that of prewar."

The February 1947 resolution of the Party placed the raising of yields in the kolkhozy at the head of tasks for the MTS. Among other measures to attain this, it ordered two ministries to prepare for the Council of Ministers within two months a draft of a new scale of payments of the MTS, on which the latter would be dependent, based on yields and on timeliness of operations. The order somehow overlooked the fact that from the very beginning the rates for services of MTS had varied greatly with the kolkhoz yields. A number of measures in the February 1947 decision of the Party, and in the orders issued in compliance with that decision, were also directed toward increasing the interest of the MTS *personnel* in the yields obtained by the kolkhozy. The most important of these was the reduction in the guaranteed minimum of food grain, in case of nonfulfillment of yield goals (see p. 285).[58] Evidence, however, is ample that the number of hectares of standard plowing per tractor is to remain the principal measure of MTS efficiency. The improvements brought about by the campaign may turn out to be slight rather than fundamental.

Payment for the services of the MTS.—The existing system of payment for the services of the MTS dates from 1933, when uniform rates were established. In accordance with a resolution of the Party of January 30, 1933, the payment has to be ex-

[57] See especially Andreev's February 1947 report.

[58] The improvement of yields may have been used only as a pretext to bring the payments of the tractor drivers into line with the depreciation of the trudoden (see pp. 403–05).

clusively in a portion of the crop. The MTS were given the right to get their share from the first returns of the crop.

The rates for combining and threshing with stationary thresher are in percent of grain threshed. All other rates are per hectare, but they too rise with the yield, and indeed more rapidly than the latter. Since the yields used are on-the-root,[59] the actual payments are substantially higher than they seem at first glance. The yields on which the payments are based are generally established for the entire raion (district).

The variation of the rates with the size of the crop has been the principal feature of the rate structure from the beginning. Before May 10, 1947, for example, there were seven yield-classes for payment of the MTS for the various operations in grain and sunflower. In a portion of the Ukraine, where rates are lower than in the principal grain areas, the rates for fall and spring plowing were as follows:[60]

Class	Yield in quintals per hectare	Payment in kilograms per hectare
1	Less than 5	9
2	5 to less than 7	22
3	7 to less than 9	50
4	9 to less than 11	70
5	11 to less than 13	90
6	13 to less than 15	110
7	15 and over	130

An order of the government and Party, dated May 10, 1947, made the seventh class read "15 to less than 17" and added two new classes, "17 to less than 19," and "19 and over."[61]

The big reduction in payment to the MTS in case of crop failure is certainly a great advantage for the producers. However, the existing rate structure implies that the payments are considerably higher for kolkhozy in regions with normally higher yields and this is tantamount to a differential land rent. The government, furthermore, makes itself partner in any improvement to which it contributed nothing. The arrangement is

[59] For a discussion of on-the-root yields see pp. 728–36.

[60] *Handbook for Chairmen of Collective Farms* (Moscow, 1945), p. 67.

[61] *Socialist Agriculture*, May 29, 1947. This was the second such change. Originally the lowest yield class was below 3 quintals, the seventh and highest was 13 quintals and over (government order of February 17, 1934).

unfair also because areas with higher yields normally have less land per household and peasant. In this way, also, crop production in areas which are economically unadapted is made profitable at the expense of the peasants of other areas. By similar arrangements specific crops are fostered in areas to which they are unadapted.[62]

The principal aim of the changes in rates ordered by the resolution of the Party of February 1947 was to foster an increase in yield, but the payment received by the MTS for their services was strongly dependent on the yield from the very start. The new changes in rates consisted merely in that a double set was established by the order of May 10, 1947: for operations performed on scheduled time and for delayed operations. The official daily publication, discussing the new rates, mentioned among the examples that the payment for timely spring plowing in the principal grain areas at a yield of 9–11 quintals was to be 100 kilograms per hectare, for untimely plowing 81 kilograms.[63] The same paper comments upon this change as follows:

> In the new law on differential rates of payment, the responsibility of the MTS for the fulfillment of the contract with each kolkhoz with respect to the volume of the several operations, as well as their quality and timing, will be reflected in a reduced quantity of grain per hectare for such operations as are performed after the expiration of the agreed date.

It is difficult to believe that the moderate differentiation of the rates depending on the time of performance will add a great deal toward an increase in yield, since the strong differentiation in payment according to yield failed.

The following tabulation shows what kolkhozy in the principal grain areas have to pay (in kilograms per hectare) for operations in grain and sunflower seed yielding 9 to less than 11 quintals on the root (or, let us say, 8 quintals in the barn) at rates in force since the 1947 crop:[64]

[62] The rates on the certainly unprofitable unirrigated cotton were only about one-tenth of those on irrigated cotton before the war, and probably are still. See the writer's article, "Unirrigated Cotton in Southern Russia and the Danubian Countries," *Foreign Agriculture*, January 1947, XI, 12.

[63] *Socialist Agriculture*, May 29, 1947. Despite considerable effort, the writer was unable to obtain a full tabulation of the rates.

[64] Information pieced together from the daily *Socialist Agriculture*, and from a leading article, "To Collect Payments on Time," in *Machine-Tractor Station*, a monthly of the Ministry of Agriculture, July 1947, pp. 1–3.

Operation	Timely	Delayed
Fall plowing	108	104
Two cultivations	22	17
Seeding	18	14
Combining[a]	88	56–60
Total	236	191–195

[a] The rate for timely combining is 11 percent of the threshed grain; for delayed combining one of the sources cited gave 7.0 percent, the other 7.5 percent.

Thus the total payment for all operations performed on time is almost 30 percent of the barn crop. The similar payments for certain central oblasti, Ukraine west of the Dnepr, and White Russia total about 205 kilograms or over 25 percent of the crop. Payments are slightly smaller when the land is plowed in the spring, but higher for crops grown on fallow land.[65]

In their early days the MTS operated with small tractors; now a great deal of work is done with large track-laying tractors, some of which are diesel-powered. One would expect that the rates would gradually be reduced. The reverse is true, however. The repeated elimination of low-yield classes and addition of high-yield classes amounts to raising the average charges. But the rates for the same classes are also higher now than in the early days.

Such a raise was actually implied also in the new separate rates for timely and delayed performances: those for timely performances were established higher, and those for delayed performances lower, than the preceding uniform rates. Even now, most operations are performed on time scheduled in the "contracts," a practice that will be increasingly followed in the future.

The rates for individual operations were rather high in the beginning, but there existed rates for complexes which included all or most operations. According to the rates approved by the Commissariat of Agriculture on February 17, 1934,[66]

[65] Originally, the rates were uniform for the entire USSR. The writer has been unable to find out when the regional differentiation started. It would be interesting to know how much the rates are discounted in the added territories, where the peasants have yet to be lured into the kolkhozy.

[66] *Finance-Economic Reference Book on Kolkhozy*, compiled by E. M. Gailis and others (Moscow, 1936), pp. 70–71.

the kolkhozy had to pay, on grain and sunflower seed yielding 9 to less than 11 quintals, 120 kilograms for the complex and 8 percent for threshing (64 kilograms on 8 quintals), a total of 184 kilograms. This is about 50 kilograms less than the principal grain areas have to pay for the same operations performed on time now. That now the kolkhozy pay per operation rather than for a complex, and that plowing is substantially deeper, are very inadequate compensations.

Costs and profits.—The costs of operating the MTS are calculated per hectare of standard plowing. But the available data on these costs are useless for ascertaining whether the MTS made a profit and, if so, how large a profit. Under these conditions one has no choice but to resort to an over-all appraisal, which is necessarily very crude.

The total value of crops in 1938 (assuming normal weather) is estimated at 12.1 billion 1926–27 rubles (chapter xxviii). The share of the kolkhozy in the 1937 gross production of vegetable products was officially estimated at 76 percent.[67] The MTS may have participated in the kolkhoz operations on crops to the extent of 75 percent. Thus, they participated in the output of about 6.9 billion rubles worth of products in 1938. If the MTS at the then prevailing rates of payment for their services, received 20 percent of the gross value of the production in which they participated, they may have earned about 1.4 billion rubles.[68]

The staff on the payroll of the MTS was given officially at 758,304 persons for the beginning of 1938.[69] But 95,832 of them were brigadiers for whose wages during the season the MTS were probably reimbursed by the kolkhozy. The all-year personnel of the MTS may have been around 700,000 in the late 'thirties. At five hundred 1926–27 rubles per person per

[67] *Socialist Agriculture USSR, 1938*, Gosplan (Moscow, 1939), pp. 86 and 88.

[68] Of their *total* crops, the kolkhozy paid to the MTS in 1938 the following percentages:

Grain	16.0
Cotton, irrigated	17.5
Cotton, unirrigated	5.0
Sugar beets	17.8
Sunflower seed	16.0

See A. Arina, "Kolkhozy in 1938," *Socialist Agriculture*, December 1939, pp. 63–64.

[69] *MTS in the 2d Stalin Five-Year Period*, pp. 90–91.

year, the total outlay for the personnel would have been equivalent to 350 million rubles.[70]

The share of the MTS in the other expenses of agriculture may be estimated as follows (in million 1926–27 rubles):[71]

Item	Total	Share of the MTS
Depreciation		
Buildings for productive purposes	219	50
Melioration and irrigation	57	0
Tractors, trucks, automobiles	302	195
Other machinery	300	200
Horse-drawn vehicles, small implements	184	10
Processing equipment	80	0
Total	1,142	455
Non-agricultural materials		
Motor fuel and lubricants	333	222
Spare parts	300	200
Fertilizer	210	None
Other materials	100	25
Total	943	447
Grand total	2,085	902

Thus the total outlay of the MTS was equivalent to 1.25 billion rubles. Since receipts were estimated at 1.4 billion, a profit for the government of 150 million rubles is indicated. But the computation is so crude that one can put little faith in its correctness. It is just as likely that the state made a bigger profit or none at all on the MTS. The profit in any case must have been only a minor consideration from the point of view of the state.

Although the state apparently did not make a very substantial profit on the MTS (it must be remembered that no interest on the investment is counted), this does not mean that the services of the MTS were or are profitable for the peasants. The animal power that the kolkhozy own is not utilized effi-

[70] The average pay of workers and employees in sovkhozy and MTS in 1930 was 608 rubles per year (*Agriculture USSR, 1935*, p. 224). The average pay of all workers and employees in the USSR increased by 33 percent from 1928 to 1930 (*Socialist Construction USSR, 1936*, p. 512). There was little change in pay from 1926–27 to 1928. The average pay of the workers and employees of the MTS was probably somewhat higher than that of the sovkhozy.

[71] See Appendix Note O, especially Table 67, p. 767.

ciently, owing to the arrangement with the MTS; the saving on labor through the use of motor power and large-scale machinery is small under the conditions prevailing in the kolkhozy (pages 423–33); and improvements in yields have been, on the whole, small and were certainly not beyond the reach of the average peasant without the MTS.

The computation above was based on rates of payment which average markedly less than those in effect since the 1947 crop. When the prewar yields have been restored the state may well make a substantial profit on the MTS.

CHAPTER XIII

EARLY KOLKHOZY AND THE BIG DRIVE

The 1917 Revolution resulted in extensive expropriation, but chiefly of the property of large owners. The later enforced collectivization of peasant farms actually amounted to the expropriation, from some 20 million small owners representing a population of nearly 100 million, of practically all their land and machinery, and a large part of their livestock and buildings other than dwellings. In the process, moreover, they lost a large part of the remaining livestock and many buildings. While the expropriated goods formally became the property of co-operatives (kolkhozy), of which the former landholders or owners of machinery, livestock, and buildings became members, this property ceased to fulfill its former purpose of serving the needs of its now only nominal owners.

The peasants' property and enterprises, as in other parts of the world, had existed for the benefit of the peasants themselves. That in satisfying their own needs they served the needs of others as well was entirely incidental. The collectivized land and other property of the kolkhozy, on the other hand, serve primarily the needs of others. The kolkhozniki get only the leftovers, if anything is left. They are assured merely the produce of a tiny vegetable garden and of a small number of livestock, privately held or owned by them. This produce, in the aggregate, amounts to only about one-third of the quantity previously obtained by the peasantry, yet it is subject to obligatory deliveries in kind and to taxes. The income from the private enterprises of the kolkhozniki is, indeed, purposely kept far below the subsistence minimum in order to insure to the kolkhozy the labor of the kolkhozniki, however low the reward for it may be.

The idea that only their small private enterprises should serve the kolkhozniki, while the kolkhoz economy should pro-

duce primarily for the non-rural population and industry, both represented by the state, was not stressed in the beginning. Indeed, for a time the Soviet leaders played with the idea that the kolkhozy should deliver only their "marketable surpluses." However, by means of "deliveries in full to the state of all marketable surpluses but no less than . . . ."[1] in combination with the establishment of priority on these deliveries, the market no longer received the leftovers of peasant production after the producers' needs were covered; instead the peasants received what was left of their production after the state's needs were satisfied. Instead of primarily affecting marketings, the crop hazards were reflected mainly in the distributions to the kolkhozniki. The application of the term "first commandment," introduced in 1931, to the obligation of the kolkhozy to deliver the state's quota out of the first proceeds, however small the crop might be, speaks for itself.

The commercial kolkhoz livestock fermy were organized in 1931. As the name implies, these fermy were intended for the production of animal products exclusively for sale, and not for the members, who were supposed to have a claim only to a share in the money return, if any. In the beginning the fermy were not intended to be the exclusive form of collectivized animal husbandry,[2] but it was soon decided that all collectivized livestock must be transferred into those fermy. If the kolkhozniki did not have any livestock of their own, or any of a specific type, such as a cow (and a large proportion of them were in this unenviable position), they had to do without the corresponding animal products.

To insure kolkhoz production, the seed, feed, and other requirements of the kolkhozy and the commercial fermy (see pp. 353 ff.) were also given priority over the needs of the kolkhozniki. Thus the claim of the kolkhozniki for a share in the products was definitely relegated to the last place.

[1] See "Model Contract for the One-Year Kontraktatsiya of Grain, Technical Crops, etc.," for the 1930 crop, approved Nov. 1, 1929; also *Laws on Collectivization of Agriculture and the Struggle for the Harvest*, compiled by A. Bodyako and S. Zaitsev (Moscow and Leningrad, 1930), p. 189.

[2] Order of the government and Party of July 30, 1931. See *Most Important Decisions on Agriculture*, State Publishing Office of Kolkhoz and Sovkhoz Literature (2d ed., Moscow, 1935), p. 342.

A co-operative organization which exists not for the benefit of its members but primarily as a means of extracting farm products without regard to the needs of the producers themselves lacks all normal features of a co-operative. The misnamed kolkhoz is the nutshell of a co-operative without the nut.

To insure fulfillment of the first commandment everything pertaining to the kolkhozy is minutely regulated, and their activities are under the strictest supervision of the Party, government, Commissariat of Agriculture, and all their local agencies including the MTS. The chairmen and board of the kolkhozy are only the smallest cogs in a big administrative machine. The election of these officials is nothing but a farce.

In practice the kolkhozniki have no more to say about the operations of their kolkhozy than have the workers on the sovkhozy. But unlike the latter, the kolkhozniki are not assured a subsistence minimum. This is the chief advantage of the kolkhozy over the sovkhozy from the point of view of the Party and government. It is one of the reasons why the sovkhozy were soon relegated to a subordinate position in Soviet agriculture, despite the fact that in principle they were and still are regarded as the only real form of socialist organization of agriculture. The kolkhozy are the basic form of socialized agriculture in the present stage of development of socialist economy (Soviet brand), and are certain to remain so.

THE EARLY PERIOD

The kolkhozy of the early period, which lasted until the end of 1927, were voluntary, small, and self-sufficing to a large extent. For the most part they were heavily subsidized, but in spite of liberal support from the government, they showed no tendency to grow.

The period of War Communism favored the development of the kolkhozy. Industry almost ceased to exist. City workers (among them many Party members), who were forced back to the land, looked to the government for help. The government was willing to give aid, provided the settlers united in kolkhozy. But everything was on a small scale. On July 1, 1921, 16,000

kolkhozy with 227,900 households (about one percent of all peasant households) were counted.

Interest in kolkhozy slackened when the New Economic Policy (NEP) was proclaimed in 1921 (see p. 159). Their number and membership were even permitted to decline to 14,832 and 194,700 households respectively in 1927. On June 1, 1927, the last date in that period for which data are at hand, 0.7 percent of the peasants' cropped plowland, but only 0.2 percent of their workhorses and 0.1 percent of their cows, were collectivized.[3] The gross production of the kolkhozy amounted to 88 million rubles or 0.6 percent of the total gross agricultural production.[4] In 1926 Oganovskii, Assistant Commissar of Agriculture, wrote: "The process of collectivization of the small peasant enterprises . . . . is a very slow one, which may be concluded only in decades."[5] Even this statement was not justified by the preceding development, which had pointed to a decline, and was merely a concession to the Party demands.

Three types of kolkhozy were distinguished: communes, arteli, and TOZ.[6] The commune, particularly adapted to the psychology of the War-Communism period, was the first to emerge; the artel followed, while the TOZ came last.

The commune was a full realization of the Communist ideas of the earliest period: "From everyone according to his ability, to everyone according to his needs." This principle was even incorporated in the model statute of the commune, approved by the Commissariat of Agriculture in February 1919. Everything in the commune was in common, even dwelling houses and meals. In the earliest period their membership consisted principally of city workers, largely Party members, who could not contribute any means of production. These were provided almost entirely by the state.[7]

[3] *Shifts in Agriculture USSR between the XVth and XVIth Party Congresses*, Gosplan (2d ed., Moscow, 1931), p. 29.

[4] *1st Plan*, II, Part 1, pp. 328–29.

[5] N. P. Oganovskii, in *Economic Review*, January 1926, p. 15.

[6] The abbreviation TOZ implies an agricultural organization. The agricultural communes and arteli are so qualified in the USSR, but the qualification is omitted in this study, because, except in passing (chapter vii), no other communes or arteli are discussed.

[7] See N. Demyanov, "To the History of the Trudoden," *Problems of Economics*, June 1940, pp. 191–294.

The TOZ, an abbreviation of the Russian "co-operative for the working of the land," was the loosest form of organization. All productive livestock and most workstock remained private property. Even the working of the soil and the machinery for this were only partly collectivized in the TOZ. The artel was intermediate between the commune and the TOZ, with field work almost entirely collectivized and productive livestock partially so.

There was a pronounced difference in the attitude of the Party and producers toward the various types of kolkhozy. The TOZ were regarded with suspicion by the Party as too bourgeois; their degree of collectivization was considered greatly inadequate. The communes were accepted as ideal, but their low efficiency and full dependence on state funds, as well as the peasants' attitude toward them, could not be ignored. The artel was the Party's second choice; it provided a satisfactory degree of collectivization, while the extent of individual tenure or ownership, represented by the vegetable gardens and small numbers of livestock of the kolkhozniki, was deemed acceptable. These enterprises bound the kolkhozniki to the land, yet provided them with so little that they were dependent upon work for the kolkhozy, however small the reward might be.

Even the propertyless, when they decided to join a kolkhoz, rarely chose the commune after the initial enthusiasm (mostly on the part of city people invading the countryside) for this form of collective had cooled. The number of communes began to decline as early as 1919.[8]

With the commune not seriously considered, the choice of potential members lay between the artel and TOZ. They obviously preferred the latter because it deprived them of the

[8] In nine regions reperesenting about 95 percent of European Russia, the number of communes and arteli were as follows:

Date	Communes	Arteli
Jan. 1, 1918	950	422
June 1, 1919	2,099	1,935
Jan. 1, 1920	1,732	3,865
Jan. 1, 1921	1,829	9,064
Sept. 1, 1921	1,528	10,015

See B. Knipovich, "Directions and Results of Agrarian Policies, 1917–20," *On Land*, ed. by a Committee of the Commissariat of Agriculture, RSFSR (1st issue, Moscow, 1921), p. 36.

least amount of independence. So long as the negative attitude of the Party toward this type of collective was not reflected in very strong action, the TOZ gained rapidly on the arteli. From June 1, 1920 to June 1, 1927, indeed, the number of arteli declined from 11,440 to 7,135, while the TOZ increased from 1,439 to 6,362.[9] On June 1, 1927, the kolkhozy were distributed as follows among the three types of collectives (in percent):[10]

Type	On basis of kolkhoz numbers	On basis of household numbers
Communes	9.0	13.2
Arteli	48.1	45.5
TOZ	42.9	41.3

The degree of collectivization in the kolkhozy surveyed in 1928 is shown in the following tabulation:[11]

Item	Percent of designated items collectivized		
	Communes	Arteli	TOZ
All principal means of production	99.5	67.0	32.0
Agricultural machinery	100.0	91.9	81.9
Cropped plowland	99.8	83.4	54.9
	Percent of collectives having designated items collectivized		
	Communes	Arteli	TOZ
Dwelling houses	99.2	39.0	4.7
Other buildings	98.4	40.7	10.7
Agricultural machinery	99.2	93.8	79.9
Tractors	65.9	26.9	25.5
Workstock	97.6	59.3	32.4
Cows	98.4	34.5	5.1

It is obvious from the tabulation and from the data on page 299 pertaining to all kolkhozy that cows were collectivized to a much smaller degree than arable land and workstock—a clear reflection of the fact that crop growing is more adapted to collectivization than animal husbandry. Furthermore, the collectivized animal husbandry proved the least successful aspect of the kolkhoz activities. The Gosplan wrote in 1928:[12] "Amidst the

[9] Data from *ibid.*, p. 36, and *Shifts in Agriculture* . . . . , pp. 22 and 30.

[10] *Shifts in Agriculture* . . . . , p. 30.

[11] N. Mikhailov, "Certain Features of Organization of Collective Agricultural Farms," *Economic Review*, July 1929, p. 155.

[12] *Control Figures of the National Economy USSR for 1928–29*, Gosplan (Moscow, 1929), p. 235.

general lagging in the dairy industry, the situation is most unsatisfactory in the socialized sector."

On June 1, 1928 all kolkhozy averaged 12.5 members (mostly households, but including some individuals); the communes were relatively the largest with an average of 19.[13] The proportion of Party and Communist youth members and candidates was far greater in the communes, in both total membership and personnel serving on kolkhoz boards, than in either the arteli or TOZ. The survey of 1928 revealed the following:[14]

Type of kolkhoz	Percentage of the membership	Percentage of the board
Communes	31.1	60.7
Arteli	9.9	19.5
TOZ	5.0	13.3

The collectivized cropped plowland of all kolkhozy averaged 41.7 hectares. While the communes averaged 123.2 hectares of such land, the average was 48.1 hectares for the arteli but only 31.3 hectares for the TOZ.[15] The difference had a regional basis, for the communes had been bunched in areas of relative land abundance; but the generosity of the government toward the communes was also a factor.

Over 70 percent of the collectivized investment of the communes investigated in both 1927 and 1929 was obtained from the government either gratis or on credit, in about equal proportions. Most of their land was also obtained from the State Land Funds or Fund gratis.[16] About three-quarters of the collectivized investment of the TOZ was obtained with the help of government credit; assets obtained gratis from the state played a minor role in that type of kolkhoz. The arteli were intermediate between the communes and TOZ in this respect also, but the common feature of all kolkhozy was that most of the collectivized funds were obtained from the government in one way or another.

The kolkhozy were naturally much better equipped with machinery than the average peasant farm. The TOZ were largely

[13] *Shifts in Agriculture* . . . . , p. 36.
[14] Mikhailov, *op. cit.*, p. 162.
[15] *Shifts in Agriculture* . . . . , p. 36.
[16] Most members did not hold any land when they joined the kolkhozy.

organized for the very purpose of purchasing expensive machinery, while the other kolkhozy and especially the communes were privileged receivers of such machinery. Still, the inadequate supply of machinery and the small size of the enterprises kept even the collectives from being more than moderately mechanized. On June 1, 1928, 33,258 collective farms owned 9,548 tractors, 20,838 seeding machines, and 20,641 grain harvesters, of which only 3,442 were binders.[17]

Because of their limited acreages, the kolkhozy were unable to make full use of all their machinery (see, however, p. 277 on their satisfactory use of tractors). Since machinery was scarce, that fact was used to support the idea that it should preferably be concentrated in the lending points (see pp. 269–70).

While the Gosplan acknowledged such achievements of the kolkhozy as better rotations and improvements of yields to 15 to 20 percent above the peasant averages,[18] it was on the whole rather cool toward them. It wrote: "Their crop husbandry was not on a high level and they had no substantial accumulations."[19]

The fact that, despite all encouragements, the number of kolkhozy and their membership remained almost negligible is in itself a proof that they were not thriving. The high rate of mortality of the kolkhozy and the fluidity of their membership give further evidence of this. Prokopovicz compiled from official sources the following data on the yearly liquidation of individual kolkhozy (in percent):[20]

Year	Communes	Arteli	TOZ
1924	22.3	16.4	12.3
1925	26.4	14.3	8.0
1925–26	27.2	30.1	30.1
1926–27	20.8	21.8	26.6
1927	21.6		36.0

In spite of a heavy net increase in total membership in 1927–28, the losses of members constituted the following percentages of the

[17] *Shifts in Agriculture . . . .*, pp. 110–11.

[18] *Control Figures . . . . for 1928–29*, pp. 242 and 244.

[19] *Ibid.*, p. 243.

[20] S. N. Prokopovicz, *Russlands Volkswirtschaft unter den Sowjets* (Zürich and New York, 1944), p. 78.

number at the beginning of the fiscal year: communes, 21.2; arteli, 24.2; TOZ, 31.2.[21]

THE DRIVE

Between June 1, 1927 and June 1, 1928, the number of kolkhozy increased from 14,832 to 33,258, and their membership from 194,700 households to 416,700. The Gosplan touched upon this development as follows: "1927–28 was a year of rapid increase in collectivization. The collectives were being organized without plans, without serious organizational and agronomic help."[22] But these deficiencies were trifling compared with the chaos that followed.

The Gosplan's goal.—The Gosplan, whose appraisal of the activities of the kolkhozy was quite reserved, naturally displayed great reluctance in planning for a large expansion of collectivization during the 1st Plan Period. In spite of the urgent demands of the Party, individual peasant farming would have remained almost intact at the end of that period, with little more than the natural increase in rural population going into kolkhozy, had the 1st Plan been followed. Characteristically, the increase in collectivization planned for the sixth plan year was almost half as large as the increase planned for the first five years. The reluctance of the Gosplan to call for rapid collectivization is further indicated by the fact that, while the maximum variant of the Plan commonly had higher goals than the basic variant, the same rate of collectivization was specified in both.

Following are the highlights of the 1st Plan with reference to collectivization:[23]

Item	1927–28 actual	1932–33 Basic goal	1932–33 Maximum goal	1933–34 Basic goal	1933–34 Maximum goal
Rural population (millions)					
Collectivized	1.1	12.9	12.9	18.6	18.6
Non-collectivized	122.0	121.5	121.0	117.9	116.9
Cropped plowland (million hectares)					
Collectivized	1.1	14.5	14.5	20.6	20.6
Non-collectivized	113.3	120.7	122.4	118.5	120.5

[21] Prokopovicz, *op. cit.*, p. 82.
[22] *Control Figures . . . . for 1928–29*, p. 240.
[23] *1st Plan*, II, Part 1, pp. 328–29.

Item	1927–28 actual	1932–33 Basic goal	1932–33 Maximum goal	1933–34 Basic goal	1933–34 Maximum goal
Gross production (million 1926–27 rubles)					
Collectivized	88	2,005	2,480	3,000	3,800
Non-collectivized	13,722	17,180	18,459	17,780	19,298
Marketings (million 1926–27 rubles)					
Collectivized	24	796	1,060	Not stated	
Non-collectivized	2,774	4,107	4,754	Not stated	

Thus the individual sector of the peasantry in the last year of the five-year period (1932–33) would have declined, in number of population, by less than one percent. It would have retained almost 90 percent of the gross production of all peasants (i.e., of total production excluding that of state farms), and would have been responsible for 83.8 or 81.8 percent of the peasants' marketings. The share of the collectivized sector in gross production and marketings of all peasants at best (maximum variant) would have been 12.3 and 18.2 percent respectively.

The actual rate.—The provisions of the 1st Plan with reference to collectivization were discarded before the Plan as a whole was approved. The village peasantry, one hundred million strong, had to be—and were—collectivized practically overnight. On November 7, 1929, in an article in *Pravda* entitled "The Year of the Great Turn," Stalin enthusiastically proclaimed: "The peasants have been joining the kolkhozy, joining by whole villages, volosti, and raiony."[24] A more exact idea of the rate of increase in collectivization and the attitude toward it can be obtained from a leader in *Economic Review* by its editor, Svetlov:

> To characterize the rate [of change in the social-economic structure of agriculture] it is sufficient to point out the rapidity with which the prospects of collectivization changed. Thus, in May 1929, in projections as to the rate of collectivization, we assumed the possibility of having, in the spring of 1932, 14.5 million hectares of cropped plowland collectivized. [This obviously refers to the 1st Plan, which was approved in May 1929.] In September 1929, however, it became possible to count on the fulfillment of that plan two years earlier, i.e., in the spring of 1930. [Plan for 1929–30 as given

[24] Joseph Stalin, *Problems of Leninism* (9th ed., Moscow, 1934), p. 439.

in *Control Figures . . . . for 1929–30* (Moscow, 1930), p. 124.] But even this "daring" plan also proved a great underestimate. As early as December 1929 a decision of the Council of People's Commissars ordered that a minimum of 32 million hectares of spring sowings, or one-third of the total, be collectivized the following spring. But events outran these projections as well.[25]

Svetlov finished by saying—and he was very enthusiastic over this prospect—that there would obviously be at least 40 million hectares of spring sowing collectivized in the spring of 1930. As to the expected rate of the collectivization of livestock, the following statement from the Livestock Plan of the Peoples' Commissariat for Agriculture of the USSR for 1930–31 is worth noting: "Considering that in 1930–31 not less than two-thirds of the livestock will be collectivized . . . . ."—in other words, kolkhoznik holdings, at most, would be half those of the kolkhozy proper.[26] Since only a small proportion of the peasant livestock was kept specifically to produce products for sale, the plan clearly implied severe encroachment upon noncommercial and semicommercial holdings of the kolkhoz peasants. Later, the Party and government acted as if nothing like this had ever been contemplated, and as if the collectivization of peasant livestock that was not strictly commercial was attributable merely to excesses on the part of local officials.

The change from the torpor of the period 1921–27 to the furious increases in subsequent years, months, and even days, could not have been attained by persuasion. In his speech on December 29, 1929, Stalin branded reliance on the natural flow, "samotek,"[27] in socialist construction as an anti-Marxian idea. In plain language this meant that the peasants had to be whipped into the kolkhozy. In the crudest way, huge areas were designated for "complete" or "summary" collectivization by a certain date. "Raiony of entire collectivization" was indeed a legal term, if one can speak of legality in connection with all that violent lawlessness. The *History of the Communist Party* said clearly: "Complete collectivization meant that all land of the raion be-

[25] F. Svetlov, "A Bolshevist Sowing Campaign," *Economic Review*, January 1930, p. 3.

[26] *Laws on Collectivization of Agriculture . . . . .*, pp. 214–15.

[27] "Samotek" literally means natural flow of a liquid, but the word is frequently used figuratively in Russia.

came the property of the kolkhozy."[28] Each peasant in such a raion obviously had to join.[29] The kombedy were revived[30]—those disreputable organizations (well-remembered from the War-Communist period; see p. 158) of persons of the sort who have nothing to lose and easily become instruments of dictatorships.

To break any future resistance, it was important to eliminate those peasants who were about to lose most and were also most fit for leadership. An additional consideration in favor of liquidating these groups was the desire to use their property as a bait for the poorer peasants. Since collectivization had increased manyfold, the earlier system of inducements in the form of state credits and unreturnable donations could not have been maintained. The drive started at the end of 1927 with "limiting the exploitative tendencies of the kulaki." At the end of 1929, when the all-out struggle was decided, "liquidation of the kulaki as a class" became the battle cry.

In theory, only the kulaki and well-to-do were subject to liquidation as a class, but in practice—even in legislative practice—everyone unwilling to join was declared a kulak. The order of the Central Executive Committee of the USSR of January 25, 1930, concerning the new functions of the village soviets in connection with the widespread collectivization, stated: "A village soviet which does not revise its work to adjust it to the new functions in connection with the mass collectivization . . . . will be in fact a kulak-soviet."

What was going on is well described in the resolution of the Central Committee of the Party of March 15, 1930.[31] "In some raiony the percentage of *raskulachennyi*[32] reached 15, the percentage of those deprived of their suffrage rights, 15 to 20." "Marauding, dividing of property, arrests of average and even poor peasants . . . . ." "There were observed facts of com-

[28] *History of the Communist Party of the Soviet Union (Bolsheviks)*, ed. by a Commission of the Central Committee of the CPSU(B) (Moscow, 1946), p. 290.

[29] See also the vivid description of a participant on pp. 316–17.

[30] Orders of the Party of Dec. 24, 1929, and of the government of Feb. 25, 1930. See *Laws on Collectivization of Agriculture . . . .*, pp. 143–46 and 232–34, respectively.

[31] *Most Important Decisions on Agriculture* (2d ed.), pp. 417–19.

[32] *Raskulachennyi*, a term coined from kulak, means those deprived of their property that qualified them as kulaki.

pulsory collectivization of dwelling houses, small livestock [i.e., hogs, sheep, and goats], and milk cattle not producing for the market . . . . ."

The avalanche rolled on and on. When, in a few weeks, more than half of the peasantry was collectivized (about 60 percent in the RSFSR), a halt was called by Stalin's letter, "Dizziness from Successes," published in *Pravda*, March 2, 1930. This was followed by more detailed instructions, as in the decision of the Central Committee of the Party of March 15, 1930, "On Distortions of the Party Line with Reference to the Collectivization Movement," from which the quotations above were taken.

Stalin's letter and the various resolutions and orders reaffirmed the "voluntary" character of the joining of the kolkhozy. But the actual meaning of the call to halt had nothing to do with this. Otherwise the preceding planless herding of dozens of millions of peasants and practically all livestock into the kolkhozy would not have been proclaimed a "success," a "great achievement."[33] It was simply felt that the time was ripe to consolidate the successes by putting some restraint on the unbridled drive. The opportunity was also welcomed to transfer the responsibility for the ruthless compulsion to local officials.

The peasants were at first fooled by the reaffirmation of the principle of voluntariness. In two months the proportion of households collectivized in the RSFSR fell from 60 percent to 23.4 percent, i.e., over half of the households hastened to withdraw.[34] But the true situation was soon realized. Stalin's speech to the XVIth Party Congress on June 27, 1930, for example, left no doubt that the peasants *had* to accept collectivization. The VIth Congress of the Soviets in March 1931, having declared that "by that policy [collectivization] we have conquered hunger," continued: "The poor and average individual peasant who helps the kulak to combat the kolkhoz undermines the collectivization movement . . . . he is in fact an ally of

[33] The word "success" was in the title of Stalin's article. As to "great achievement," see Y. A. Yakovlev, *Red Villages, the 5-Year Plan in Russian Agriculture* (New York, 1931), pp. 22–26. Those interested in familiarizing themselves with the proceedings in those tragic days from an original source are advised to read this booklet by the Commissar of Agriculture of the USSR at that fateful time.

[34] L. E. Hubbard, *The Economics of Soviet Agriculture* (London, 1939), pp. 118–19.

the kulak," and finally, "The poor and average peasant has only one way . . . . joining the kolkhozy."

Those who had gladly rushed out were soon back. The official statistics indeed show 13.0 million households, or 52.7 percent of the total, collectivized by the middle of 1931. Measured in cropped plowland, collectivization exceeded two-thirds of the total at that time. Subsequent progress was necessarily slow because the steppe areas, considered to be particularly adapted to collectivization, were already largely collectivized. Still, in mid-1936, six and one-half years after the start of the full-scale drive, only 1.8 percent of peasant cropped plowland was outside of collectivization. In terms of collectivized households, the percentage was 90.5 in that year. The goal of the 2d Plan, to have no individual peasants by the end of 1937, was almost reached (see Chart 22, p. 314).

Regional and other variations in the rate of collectivization.— Steppe areas devoted mainly to grain growing were relatively best adapted or least unadapted to collectivization, since they were most suitable for the use of the tractor and, in general, to the combine as well. Least adapted were mountainous regions where farms or small groups of farms are frequently separated by hills. The many nations comprising the USSR and even the different groups of the same nations, such as the Cossacks, also differed considerably in their ability to resist collectivization.

The different adaptability of the various areas to collectivization was most strongly reflected in the rate of collectivization in the early period when joining was truly voluntary. But it was also apparent in the first years of the big drive. In its decision of January 5, 1930, the Central Committee of the Party declared that in the Lower Volga, Middle Volga, and North Caucasus regions collectivization could be "basically finished" in the fall of 1930 and in any case in the spring of 1931, while collectivization of the other grain areas was to be basically finished in the fall of 1931 or the spring of 1932 at the latest.[35] Using the scale

[35] See *Most Important Decisions on Agriculture* (2d ed.), pp. 411–12. Rather belatedly, when a great deal of irreparable damage had been done, the Central Committee of the Party in its decision of Aug. 2, 1931, specified that "basic accomplishment of collectivization" meant not an "obligatory collectivization of 100 percent of the poor and average peasants, but the joining of not less than 68 to 70 percent of the peasant households and not less than 75 to 80 percent of the peasants' cropped plowland." *Ibid.*, p. 427.

mentioned in the footnote, the Central Committee of the Party declared on August 2, 1931 that collectivization was basically accomplished in North Caucasus (without the so-called "national" raiony), Middle Volga, Lower Volga, steppe Ukraine, Ukraine east of the Dnepr, Crimea, and the grain areas of the Urals. In the remaining grain areas collectivization was to be basically finished in 1932; in other areas, including the grain-deficit areas, in 1932–33.

On July 1, 1934, when 71.4 percent of all peasant households were collectivized in the USSR as a whole, the percentage was over 80 in many level areas of European Russia devoted mainly to small-grain production. Representative of these were Saratov oblast (93.1 percent), Stalingrad oblast (81.0 percent), and Azov–Black Sea krai (81.8 percent). On the other hand, in mountainous South Caucasus with its non-Slavic population, and in even more mountainous Dagestan, only 44.7 and 23.0 percent of the respective households had been collectivized by that time. The level areas in Siberia devoted mainly to small grain lagged somewhat behind the all-Union average—the households of West Siberia were 66.9 percent collectivized and those of Krasnoyarsk 65.0 percent—simply owing to their greater distance from Moscow. In the sparsely inhabited Yakutsk oblast slightly less than 50 percent of all households were collectivized. The northern portion of European Russia, which is less adapted to mechanized crop production than the southern part, was also below the national average in collectivization. It is noteworthy that while the Western oblast had 68.8 percent of all households collectivized, the percentage was only 55.3 in the adjacent White Russia, the westernmost portion of the USSR.[36]

The regional differences became smaller as collectivization approached 100 percent, but remained clearly distinguishable. On July 1, 1938, the national average for collectivized households was 93.5 percent. But the Georgian Republic in South Caucasus had 78.7 percent collectivized, Chuvash Republic (a Tartar tribe not very far from Moscow) 74.8 percent, and Yakutsk 70.9 percent.[37]

[36] *Socialist Construction USSR, 1936*, Gosplan (Moscow, 1936), pp. 278–79.

[37] *Kolkhozy in the 2d Stalin Five-Year Period*, Gosplan (Moscow, 1939), pp. 4–5.

KULAKI AND INDIVIDUAL PEASANTS

The kulaki and individual peasants have in common the fact that they remained outside of the kolkhozy. The kulaki were denied membership; the individual peasants successfully resisted the pressure to join.

Kulaki.—The *History of the Communist Party*, after having stated that complete collectivization meant that all land of the raion became the property of the kolkhozy, goes on to say:

> But a substantial portion of the land was in the hands of the kulaki. Hence the peasants chased the kulaki from the land, dekulakized them, took away their livestock and machinery, and requested the Soviet power to arrest and deport the kulaki.[38]

A semblance of legality for the "liquidation of the kulaki as a class" was provided by the decision of the Central Executive Committee USSR of February 1, 1930. By this decision local organizations were given the right to take all measures in combating the kulaki up to full confiscation of their property and their expulsion from specified raiony and oblasti. The confiscated property of the kulaki became part of the indivisible funds of the kolkhozy. The kulaki could also be deprived of their suffrage rights in the village soviets.

This decision of the Central Executive Committee came largely after the fact, for by that time most kulaki had already been dekulakized and were no longer in the areas of their previous habitation. At the time the XVIth Party Congress convened (June 27, 1930), it could rightly have been assumed that the kulaki had disappeared. A decision of this Congress stated: ". . . . from now on in the principal grain areas of the USSR the country is subdivided into two principal parts: kolkhozniki . . . . and non-collectivized poor and average peasants."[39]

Peasant households, which had increased from 24.5 million in mid-1928 to 25.8 million in mid-1929, numbered only 20.1 million in mid-1935. The kulaki must have made up a considerable proportion of the vanished households. L. E. Hubbard, certainly a reliable writer, says on this score: "Probably not less

[38] *History of the Communist Party . . . .*, p. 290. For definition of a kulak, see chapter viii, p. 162.

[39] Characteristically, the kulaki are still blamed for the disappearance of the livestock, most of which was alive for quite a while after the kulaki had disappeared.

than five million peasants, including families, were deported to Siberia and the Far North, and of these it is estimated that 25 percent perished."[40] The tremendous increase in urban population in those years also probably consisted to a certain extent of peasants unwilling to join the kolkhozy.[41]

A mining engineer who by minding his own business succeeded in staying longer in Soviet service than any other American engineer, and had a chance to observe the kulaki in concentration camps of Siberia, wrote:[42]

> They [the authorities] treat a brutal murderer, as a rule, with more consideration than a small farmer who didn't want to turn his domestic animals and house and garden into a common pool with his neighbors to make a collective farm.

Laptev, a highly official writer, said that "about 30 million hectares of land, taken from the liquidated kulaki and, according to approximate computations, means of production valued at about one billion rubles, expropriated from the kulaki, became the property of the kolkhozy."[43] The figure for the means of production certainly does not include the assets which, although lost by the well-to-do peasants, were demolished or stolen, and therefore never reached the kolkhozy. According to Yakovlev, the property of the liquidated kulaki made up 15 percent of the principal funds of the kolkhozy in all the USSR, and as much as 22.3 percent in the so-called deficit regions.[44]

Individual peasants.—After the initial drive, during which the peasants had been forced to join the kolkhozy, those relatively few who persisted in not joining and were not declared kulaki were let alone (Chart 22, p. 314). But their life outside the kolkhozy was a bitter one. They had to pay higher taxes, deliver more products, pay higher insurance premiums—indeed they had to pay more for and receive less of everything.

[40] Hubbard, *op. cit.*, p. 117.

[41] Mere resettlement of the kulaki to other agricultural areas would not have affected the total number of peasant households.

[42] J. D. Littlepage and Demaree Bess, *In Search of Soviet Gold* (New York, 1938), p. 135. Although Littlepage exaggerates the extent of collectivization, this does not deprive his report of its great interest. He was an eye-witness of the treatment of the kulaki in concentration camps, not of the collectivization action at the places from which those kulaki had come.

[43] Laptev, *loc. cit.*

[44] Y. A. Yakovlev, speech to the XVIth Party Congress, July 10–12, 1930, in his *Problems of Organization of Socialist Agriculture* (Moscow, 1933), p. 229.

For example, according to the law of September 1, 1939, an individual peasant with an estimated income of 4,000 rubles had to pay a tax of 720 rubles, while the kolkhoznik paid 404 rubles; for an excess in estimated income over 6,000 rubles the individual peasant had to pay 45 percent in tax, the kolkhoznik 15 percent. Obligatory grain deliveries of individual peasants were 0.6 quintal per hectare higher than for the kolkhozy served by the MTS, according to an order of April 11, 1940. Meat deliveries by individual peasants were fixed at twice those of the kolkhozniki by an order dated July 8, 1939. On the compulsory insurance of all houses, machinery, livestock, and even crops, the individual peasants had to pay 66⅔ to 125 percent higher premiums than the kolkhozniki and kolkhozy, but in the case of loss they received about 20 percent less.[45]

By a decision of the government and Party of September 11, 1932, the kolkhozy were permitted to utilize the horses of the individual peasants for seeding as well as for the delivering of grain, sugar beets, and vegetables—for payment. But the decision did not bother to state how the amount to be paid for the use of the animals was to be determined, or by whom.[46]

Many individual peasants were able to avoid joining kolkhozy because they derived their principal income from sources other than farming, such as wood-cutting, fishing, and hunting, or from hiring out for work on state or even collective farms. Those owning horses frequently derived a considerable portion of their income from transporting goods or plowing gardens for the kolkhozniki, since the latter were not permitted to own horses. With the great disorganization of trade and the wide price margins between markets, not a few individual peasants were able to exist (in spite of discrimination at every step) by selling their own

[45] Order of Apr. 4, 1940.

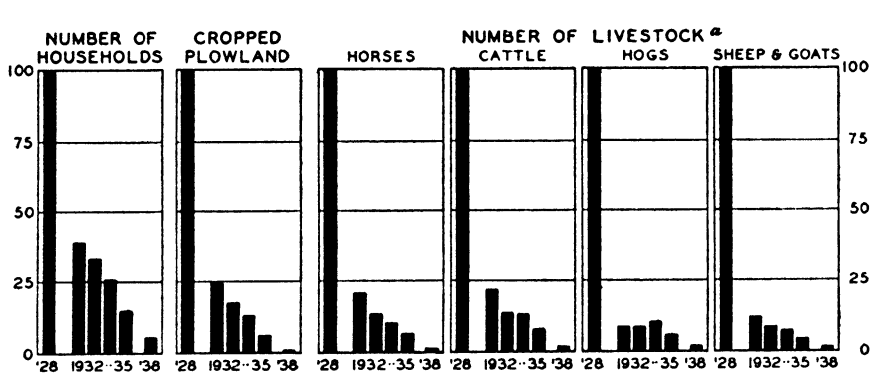
[46] Not every percentage or kilogram that the individual peasant had to pay or deliver in excess of the deliveries of the kolkhozy, and especially of the kolkhozniki, reflected discrimination. The income the kolkhozniki derived from the kolkhozy had already been subject to heavy taxation, mainly in the form of obligatory deliveries, before it reached them. Furthermore, every individual peasant would have been glad to pay somewhat higher taxes than the kolkhozniki paid on the income from his own enterprises because he did not have to work for the kolkhoz. The huge delivery and tax burdens of the individual peasant in the first place reflect the heavy burden imposed directly, and especially indirectly, on the kolkhoz peasant. To compute the net additional burden on the individual peasants would be well-nigh impossible.

produce and, illegally, the produce of the kolkhozniki on kolkhoz markets.

By 1938 their own agricultural enterprises had lost almost all significance for the remaining individual peasants. There still were 1.3 million individual households, or 6.5 percent of the total in that year (Chart 22). But they had less than one million hectares of cropped plowland (or 0.7 percent of the total held by the kolkhozy, kolkhozniki, and individual peasants) and only 2.5 to 4 percent of the different types of livestock. Their share in the total agricultural output of the three groups was a mere 1.7 percent in 1937.

CHART 22.—TWILIGHT OF THE INDIVIDUAL PEASANTS, 1928–38*

(Percentages: 1928 = 100)



* Data in Chart Appendix.

[a] June-July counts, 1928–34; Jan. 1 counts, 1935 and 1938.

On January 1, 1938, the 1.3 million individual peasant households owned 467,500 horses. By an order of August 21, 1938, a special tax was levied on those horses; 400 to 500 rubles per year for the first horse and 700 to 800 rubles for each additional horse, depending on the area.

A final blow to the individual peasants as producers of farm products was dealt by an order of May 29, 1939. According to this, the total land operated by an individual peasant household including the land occupied by the dwelling house was cut down to 1.2 hectares (to 0.7 hectare if the land was located in sugar-beet, fruit and vegetable, or unirrigated cotton areas, and to only 0.2 hectare if the land was irrigated). The fact that it was found

necessary to deal this blow in the face of the negligible production of the individual peasants is further evidence of the unhappy lot of the kolkhozniki. Even the few persecuted individual peasants may have been envied, and had therefore to be squeezed still further.

The virtual liquidation of the remnants of individual peasants as agricultural entrepreneurs is possibly more significant in principle than in fact. One of the most important features of the Revolution was the declaration of the right of everyone to till the land with his own hands. To insure this right, all land was declared common property. The first step away from this status was the substitution of state for common property in land. After the start of the big collectivization drive in 1929, no one could acquire any land. The remnants of those who were individual peasants before the start of the drive had to be eliminated. The right of everyone to till the land had definitely been turned into its opposite, the state monopoly of farming. In turn, this was partly delegated to the kolkhozy, a profitable substitute for the sovkhozy.

KOLKHOZ ENLARGEMENT

The small size of the kolkhozy in the early years was proclaimed one of their greatest weaknesses, and the necessity of a fundamental change was taken for granted. Opinions differed only as to the desired size and the methods of attaining the goal.

The 1st Plan aimed at a very large increase in the average size of the kolkhozy, but this goal was declared trifling. Fantastic sizes were not only dreamed of but actually brought into existence. Moreover, the Gosplan had envisaged a gradual growth spread over the five years, with most of it occurring at the end of the period. Under the new plans the enlargement had to be accomplished overnight, in the same sweep as collectivization itself. Indeed, enlargement became part of the big drive.

The resolution of the Party of November 17, 1929 ordered: "It is necessary to give increasing attention to the organization of large mechanized kolkhozy, which shall utilize the experience of the sovkhozy in their technical organization . . . ."[47] In

[47] *Laws on Collectivization of Agriculture* . . . . , p. 6.

the summary introduction to the report of the First Conference on Large Kolkhozy, G. Kaminsky wrote:

> By April [1929] there were 104 kolkhozy with 2,000 to 20,000 hectares each in the RSFSR. According to the preliminary data for July 1, 1929, the number of large kolkhozy in the USSR is close to 200 with a total of one million hectares.[48]

And further, on page vi: "In 1929–30 of the total cropped plowland, amounting to 8 million hectares in all kolkhozy, 3 million hectares will be in large kolkhozy." The adherents of the agro-industrial combinations wanted all peasants of entire raiony and of even larger areas ultimately united in one organization.[49] From the Middle Volga region in 1930 there was reported the organization of one kolkhoz consisting of 50 villages and 84,000 hectares, and another with 29 villages, 5,767 peasant households, and 33,533 persons.[50] The responsibility for the idea of the agro-industrial combinations was later charged to dissenting factions, although it had been approved by the resolution of the Party of November 17, 1929.[51]

As in everything else connected with the collectivization drive, the means of attaining enlargement were strictly "voluntary." Markoosha Fischer reproduces a vivid description of the manner in which enlargement was brought about, as told by a Communist from Kalinin oblast:

> "When we were told of collectivization . . . . I liked the idea. So did a few others in our village, men like me . . . . The rest of the village was dead set against it . . . .
>
> "Well, we got going. Then, one day, an order comes from the Klin party committee that we had to get 100 more families into our little collective. We managed to pull in about a dozen. And, believe me, this was not easy. It needed a lot of coaxing and wheedling. . . . . I went to Klin and explained the situation to the party committee. I begged them to let us go ahead as we started and I promised them, if they did, to have the whole village in the

[48] *For Large Kolkhozy*, Materials of the First All-Union Conference on Large Kolkhozy, Kolkhoz Center RSFSR (Moscow, 1929), p. v.

[49] See, for example, *Agro-Industrial Combinations of Siberia*, Siberia Krai Planning Commission (Novosibirsk, 1930). The Shipunovsky Combination was to consist of three sovkhozy with a total of 115,000 hectares of cropped plowland and two kolkhozy with a total of 120,000 hectares. Laptev (*op. cit.*, p. 91) reported plans according to which all Ukranian farming was to be united in only 30 agro-combinations. See also A. F. Cheshkov, "The Role of MTS in the Socialist Reconstruction," *Socialist Reconstruction of Agriculture*, July 1931, p. 41.

[50] *Izvestiya*, Jan. 20, 1930, here quoted from Prokopovicz, *op. cit.*, p. 440.

[51] *Laws on Collectivization of Agriculture* . . . . , p. 11.

collective by next year. They wouldn't listen to me. They had orders from Moscow, long sheets saying how many collectives with how many members they had to show on their records. That was all. They told me that I was sabotaging collectivization and that unless I did as I was told I would be thrown out of the Party and disgraced forever. . . . . I called a village meeting and I told the people that they had to join the collective, that these were Moscow's orders, and if they didn't, they would be exiled and their property taken away from them. They all signed . . . . And the same night they started . . . . to kill their livestock.

"I took the new membership list to the committee . . . . When I told them of the slaughter of the cattle and that the peasants felt as though they were being sent to jail, they weren't interested. They had the list and could forward it to Moscow . . . ."[52]

While the ultimate enlargement of the kolkhozy was but a fraction of that aimed at, it was still very substantial, and, moreover, had been attained in a sweep. The average size of the kolkhoz, which had increased from 12 to 18 households between June 1, 1928 and June 1, 1929, jumped to 70 on May 1, 1930.[53] The changes were even more striking in the arteli, the sponsored form of the kolkhoz, and in individual areas. In North Caucasus the results of the reorganization were as follows:[54]

	Number of kolkhozy		Average number of households per kolkhoz	
Type	1928	1930	1928	1930
Communes	199	436	22.8	90.6
Arteli	512	3,659	11.7	196.9
TOZ	5,137	580	11.7	37.1

The average membership per artel increased about seventeenfold in two years in that area.

From mid-1930 to mid-1938 there occurred a further small increase in average membership per kolkhoz from 70 to 78 households, but these figures conceal an erratic development. In some areas a process of de-enlargement had set in; the kolkhozy of North Caucasus and Crimea, for example, which averaged 189 households on May 1, 1930, had 121 on July 1, 1934, and 140 on July 1, 1938. Kazakhstan first climbed from 77 households per kolkhoz on May 1, 1930, to 127 on July 1, 1932, then

[52] Markoosha Fischer, *My Lives in Russia* (3d ed., N. York, 1944), pp. 49–50.

[53] *National Economy USSR: Statistical Handbook 1932*, Central Office of National-Economic Accounting (Moscow, 1932), pp. 130–31.

[54] Y. Nikulikhin, *Industrialization of Soviet Agriculture* (Moscow and Leningrad, 1931), p. 25. Probably data of October 1.

went down to 68 on July 1, 1935 and averaged 78 on July 1, 1938. Areas that did not get much "attention" in the big sweep showed a steady though decelerating enlargement of the average size of their kolkhozy after 1930. For example, White Russia which started from an average of only 9 households per kolkhoz on June 1, 1928 and reached 36 on May 1, 1930, had 70 on July 1, 1936 and 74 on July 1, 1938.[55]

The average acreage per kolkhoz followed in its changes that of membership, but the increase was greater. While the average number of households increased from 13 to 78, or sixfold, in 1928–38, the increase in average acreage was from 41 to 484 hectares, or more than elevenfold.

The following tabulation shows USSR and regional averages as of July 1, 1938:[56]

Region	Number of households	Hectares of cropped plowland
USSR	78	484
Lower and Middle Volga	136	1,655
North Caucasus and Crimea	140	1,253
Ukraine	141	780
Ural	83	770
Kazakhstan	79	700
West Siberia	63	612
Upper Volga	52	338
Azerbaidzhan	88	267
Central Chernozem	56	259
Uzbek	89	298
Georgia	92	174
Armenia	160	360
Northwest	37	164
European North	47	154

In the principal regions of European Russia predominantly devoted to wheat growing, comprising the Lower and Middle Volga, North Caucasus, eastern and southern Ukraine, and the Crimea, a typical kolkhoz consists of over 100 households and over 1,000 hectares of cropped plowland. The smallest kolkhozy (about 40 households and 160 hectares of cropped plowland) are found in

[55] Data for 1928–30 from *National Economy USSR . . . . 1932*, pp. 130–31; for 1932–38 from *Kolkhozy in the 2d Stalin Five-Year Period*, p. 6.

[56] *Kolkhozy in the 2d Stalin Five-Year Period*, p. 6. Certain of these "regions" represent non-administrative groupings of oblasti and/or kraya.

the European North and Northwest. To have the minimum acreage that would make it worth while for an MTS to service it, the average kolkhoz was formed of 92 households in such a rugged region as Georgia. The need for particularly rigid control also led to the organization of large kolkhozy (in terms of households) in Uzbek and Azerbaidzhan, the important cotton-growing areas.[57] In West Siberia, for which huge kolkhozy with 60,000 hectares were planned (see footnote 49, p. 316), the average collective had 612 hectares of cropped plowland in 1938.

Unfortunately, no grouping of the kolkhozy by amount of cropped plowland is available, but the distribution by number of households is shown in the following tabulation as of January 1, 1938:[58]

Households per kolkhoz	Percent of total kolkhozy
15 or less	6.4
16–30	18.5
31–60	29.8
61–80	12.8
81–100	8.8
101–150	11.8
151–200	5.5
201–300	4.4
301–500	1.7
Over 500	0.3

It will be observed that while kolkhozy of 31–60 households were the most numerous, almost 10 percent comprised 151–300 households, and almost 2 percent had over 300 households.

KOLKHOZ SPECIALIZATION

The desire to develop the kolkhozy on the same principles as those on which the sovkhozy were organized extended even to specialization. The basic decision of the Party, "Results and Future Tasks of Kolkhoz Organization," dated November 17, 1929, proclaimed: "To declare it necessary to speed up the organization of specialized livestock, dairy, grain, vegetable, technical-crop and other kolkhozy. . . . ."[59]

[57] Nearness to borders also apparently had something to do with the size of the kolkhozy. Mountainous Armenia shows the largest average number of households (160) per kolkhoz in the whole Union.

[58] *Kolkhozy in the 2d Stalin Five-Year Period*, p. 7.

[59] *Laws on Collectivization of Agriculture . . . .*, p. 10.

By a decision of the XVth Congress of the Soviets of March 17, 1931, special centers were organized to direct and co-ordinate the specialized kolkhozy, namely the Dairy Kolkhoz Center and the Hog Kolkhoz Center.[60] But absolutely nothing came of the project, and the Centers soon disappeared as quietly as possible.

THE END OF THE COMMUNE AND TOZ

When the herding into kolkhozy started, the peasants, to the great displeasure of the Party, rushed mainly into the corrals with the inscription TOZ, shunning the arteli so far as possible (Table 24). The commune had the least attraction, especially

TABLE 24.—THE "VICTORY" OF THE ARTEL FORM OF THE KOLKHOZ*

Date (June 1, except as noted)	Number of kolkhozy				Percent of total		
	All kolkhozy	Communes	Arteli	TOZ	Communes	Arteli	TOZ
1927	14,832	1,335	7,135	6,362	9.0	48.1	42.9
1928	33,258	1,796	11,574	19,888	5.4	34.8	59.8
1929	57,045	3,537	19,167	34,341	6.2	33.6	60.2
1929[a]	67,446	4,654	20,773	42,019	6.9	30.8	62.3
1930	85,950	7,564	63,517	14,869	8.8	73.9	17.3
1931	211,100	7,600	193,600	9,900	3.6	91.7	4.7
1932	211,100	4,200	202,400	4,500	2.0	95.9	2.1
1933	224,500	4,000	216,200	4,300	1.8	96.3	1.9

* *Shifts in Agriculture* . . . . pp. 22 and 30; and *Agriculture USSR, 1935*, p. 629.
[a] October 1.

since government subsidies were first greatly reduced and then almost discontinued. From June 1, 1927 to June 1, 1929, the number of kolkhozy of the various types increased as follows (in percent): all kolkhozy, 285; communes, 161; arteli, 174; TOZ, 435.

The encouragement of the arteli against the TOZ was therefore intensified toward the end of 1929. The artel was definitely made the standard, indeed practically the exclusive, form of kolkhoz in the great collectivization drive; the commune continued as the ideal to strive for at some indefinite future time while the TOZ had to be tolerated in certain areas. Following

[60] *Most Important Decisions on Agriculture* (2d ed.), p. 425.

are the decisions of the XVIth Party Congress (mid-1930) on this matter:

> The basic form of the kolkhoz at the present stage is the agricultural artel. To demand that, upon joining the kolkhoz, the peasants would at once renounce all individualistic habits and interests—the possibility of having in addition to the collectivized enterprise a supplementary individual enterprise (cows, sheep, poultry, vegetable garden), the possibility of utilizing for themselves outside earnings and so on—means forgetting the alphabet of Marxism-Leninism.
>
> The form of the kolkhoz must be adjusted to the economic conditions of the region and type of farming. Along with the artel, in the beginning the TOZ can be adapted on a wide scale in some non-grain areas, as well as in the national[61] regions of the East, as a transitional step to the artel. . . . .
>
> The kolkhoz can proceed to the highest form—the commune . . . .[62]

The VIth Congress of the Soviets, March 17, 1931, likewise considered the commune as the highest form, but only for some future time: "A mass shift to the commune can take place only after the artel form of the kolkhoz has been passed as a school."[63] In its decision of March 15, 1930, the Central Committee of the Party went so far as to prohibit the conversion of arteli into communes without the approval of the krai kolkhoz organization.[64]

Table 24 shows that the results of these measures were crowned with full and immediate success. A few months were enough for the transformation; 27,537 TOZ disappeared between October 1, 1929 and June 1, 1930, through conversion into arteli. The decisive attack on the communes occurred a year later. By mid-1933 no other kolkhozy but arteli remained in many areas. Thus, in Ivanovo oblast arteli made up 99.9 percent of the total. The TOZ retained significance only in the North Caucasus krai inhabited by the Cossacks, where 16.3 percent of the kolkhozy were TOZ, and in such "national" areas as Kazakhstan, Turkmen, and Kirghiz, where TOZ made up 29.3, 33.5, and 50.4 percent respectively of all kolkhozy. The communes remained of some importance only in the Azov–Black Sea

[61] The term "national" is applied mainly to such racial groups as inhabit the Caucasus, Kazakhstan, and Central Asia.

[62] *Most Important Decisions on Agriculture* (2d ed.), pp. 402–03.

[63] *Ibid.*, p. 425. [64] *Ibid.*, p. 418.

krai, where, in mid-1933, they comprised 9.5 percent of the collectives.[65]

While the commune was officially retained as a kind of ideal,[66] the few remaining communes were gradually so changed that they differed little from arteli. The start of the abandonment of the commune principle in labor organization was made as early as 1928 (see p. 402). The XVIth Party Congress (mid-1930) prohibited the collectivization in the communes of anything but production, i.e., the housing and eating had to be individual.[67] By the government order of June 20, 1933, the members of the communes were permitted the private ownership of a cow, "small livestock" (hogs, sheep, and goats), and poultry; the boards of the commune, the village soviets, and the district organizations were to assist the commune members in acquiring such livestock.[68] The members were also to be provided with feed as their share in the produce of the commune, and increasing emphasis was put on piecework as in all other enterprises. As time passed, the ideal of the commune fitted less and less into the Party philosophy. The commune of the 'twenties had passed into history.

Like the commune, the TOZ were rarely mentioned in later years,[69] and such references as did appear usually had to do with measures discriminating against them. By an order of September 1, 1939, for example, the agricultural tax was made 10 percent higher for the households belonging to the TOZ than for those belonging to the arteli.

THE COST OF COLLECTIVIZATION

The results of the collectivization drive are officially measured in the proportions of households and cropped plowland that were collectivized. The use of proportions rather than of absolute figures conceals the disappearance of an unknown but very large

[65] *Agriculture USSR, 1935*, pp. 636–37.

[66] In a recent handbook of materials for lecturers and propagandists, published by the Highest Party School of the Central Committee of the Party, it is stated that the transition from the arteli to the commune will occur when Soviet agriculture has overtaken that of other countries in productivity. See A. Lapin, "On Gradual Transition from Socialism to Communism," *On the Five-Year Plan of Restoration and Development of the Economy of USSR in 1946–50* (Moscow, 1946), pp. 175–76.

[67] *Most Important Decisions on Agriculture* (2d ed.), p. 409. [68] *Ibid.*, p. 444.

[69] No data on the distribution of kolkhozy by type after mid-1933 have apparently been released.

number of households through deportation and outright deaths. The population of the USSR, where births exceeded deaths by over 20 per 1,000 before the drive, increased only 10.7 percent in the decade 1928–38; this fact cannot be talked away. The birth rate declined substantially during the period. Most of the decline was the direct result of the misery caused by the collectivization drive; abortions could have been only a minor factor among such backward, deeply religious people.[70]

Although the exact degree of the decline in birth rate is unknown,[70a] there can be no doubt that only part of the slow growth in population in 1929–38 was caused by the fall in the birth rate. Many millions died who would have lived under normal conditions. The excessive mortality extended over a number of years, but the peak of starvation deaths occurred in the winter and spring of 1932–33. Most of these were in the grain-surplus areas of European Russia.[71] Most outstanding, however, was the decline of the Kazakhi, a Mongol pastoral tribe inhabiting mainly Kazakhstan, whose numbers dropped from 3,968,289 on December 17, 1926 to 3,098,764 on January 17, 1939. Even at the slow rate of increase in all the USSR in 1926–38 the Kazakhi should have numbered 4.6 million in 1939; there was thus a swing of 1.5 million[72] caused simply by the annihilation of virtually all their livestock—their only livelihood—in connection with the collectivization drive.

Before the drive the peasants had about 18 billion 1926–27 rubles invested in means of production of the rural economy, of which over 5 were in buildings for productive purposes, around 3 in machinery, and about 9 in livestock (see p. 714). Much of this investment simply disappeared. The question of the magnitude of the loss could not of course be raised in the USSR.

Livestock is the only item in which the loss caused by the collectivization drive is obvious. As shown in Table 25, for each

[70] It is hardly correct in the matter of abortions to generalize from data pertaining primarily to Moscow, as Frank Lorimer does in *The Population of the Soviet Union: History and Prospects*, League of Nations (Geneva, 1946), pp. 172–78. Moreover, in Moscow and even more in the country as a whole, the jump in abortions in the early 'thirties may have been to a large extent the result of starvation or near-starvation, which lasted for years.

[70a] No data have been published since 1928; see p. 10.

[71] See the evidence quoted on p. 553, n. 27.

[72] See Lorimer, *op. cit.*, p. 140. The figure in the text may include some who migrated to China.

horse that was collectivized, almost two disappeared in the Union as a whole. Four cattle, 5.5 hogs, and 8.5 sheep and goats were lost for each animal brought into the kolkhozy. In the extreme case of Kazakhstan, the peasant livestock was almost wiped out,

TABLE 25.—LOSS OF LIVESTOCK DUE TO COLLECTIVIZATION*

(*Million head*)

Kind of livestock	Individual and kolkhoz peasants and kolkhozy		Kolkhozy 1933	Individual and kolkhoz peasants 1933	Loss 1928–33
	1928[a]	1933			
	Soviet Union				
Horses	33.4	14.9	10.1	4.8	18.5
Cattle	70.4	33.7	9.2	24.5	36.7
Hogs	25.9	8.9	3.0	5.9	17.0
Sheep and goats	145.9	41.8	12.2	29.6	104.1
	Kazakhstan[b]				
Horses	3.8	0.4	0.3	0.1	3.4
Cattle	7.7	0.9	0.5	0.4	6.8
Sheep and goats	26.6	1.2	0.9	0.3	25.4

* Official early-summer data from *Agriculture USSR, 1935*, pp. 517–19, 527–28, and 523–33; and *Statistical Handbook, USSR, 1928*, pp. 158–59.

[a] Total livestock less sovkhoz herds.

[b] The Kazakhi Mohammedans, do not raise hogs.

and the kolkhozy got practically none. The picture would be only slightly less gloomy even if the peasant stock obtained by the sovkhozy could be considered, but no data on these purchases have been published.

Through destruction of draft power and general disorganization, the output of the peasant-kolkhoz sector, i.e., excluding sovkhozy, declined by over 30 percent in the early 'thirties and negligibly exceeded the pre-collectivization level by 1938.[78]

The freedom and the remnants of the good will of nearly one hundred million people who survived the avalanche were lost in the drive.

[78] Total gross agricultural production was 23 percent below the 1928 level in 1932 and 12 percent above it in 1938 (pp. 673–74). The share of the sovkhozy in total output increased from less than 1 percent in 1928 to 10.6 percent in 1932 and about 9 percent in both 1937 and 1938, according to official data. Actually it was slightly over 10 percent in 1937 and 1938 (see p. 263).

CHAPTER XIV

KOLKHOZY: ORGANIZATION

"Kolkhoz" is an abbreviation of the Russian term for collective farm, a specific form of co-operative. There is a vast difference, however, between the Soviet kolkhoz and the usual co-operative. Indeed, the similarity between them is only in name.

The collectivization drive was embarked upon to obtain food for the urban population, raw materials for industry, and goods of both types for export, in larger quantities and at lower prices than would have been possible under the conditions of individual peasant farming. The form of organization would have been immaterial if abundant and cheap production were achieved. But the co-operative seemed preferable in the event that this goal was not reached as a matter of course. The co-operative, though it could be a co-operative only in name, lent itself most effectively to outside control, indeed to extortion.

A co-operative in any country is supposed to distribute to its members only what is left after all its obligations, including taxes, have been met. The same applied to the kolkhozy, but with a difference which, though factual rather than legal, is fundamental. Taxes play hardly any role in the functioning of the usual co-operative, and in many countries co-operatives enjoy special tax privileges. The kolkhozy, by contrast, are obliged to make very burdensome deliveries, declared by law equivalent to taxes.

The obligatory deliveries at low prices, without regard to the needs of the producers, completely deprive the kolkhozy of the purpose of the usual co-operative—to serve the needs of its members. This deprivation is frankly recognized. Stalin stated that the kolkhozy serve the common needs, whereas the needs of the kolkhozniki are served only by their own small private enterprises (see p. 32). Yet the idea that the kolkhoz is a co-operative remains part of the official creed. The following

statement from the resolution of the XVIth Party Congress (summer of 1930), "On the Kolkhoz Movement and Strengthening of Agriculture," is quoted endlessly:

> Anti-Leninist is every attempt to transfer the system of sovkhoz organization to the kolkhozy because, *in contrast to the sovkhoz*, which is a *state institution*, the kolkhoz is a voluntary social union of peasants, *organized with the capital of the peasants themselves*, with all consequences arising therefrom. [Italics of the source.][1]

The mere thought that the state, after having taken a substantial part of the kolkhoz produce, has any responsibility for assuring the kolkhozniki even the lowest subsistence minimum, is heresy.

The fact that the kolkhozy lack the normal functions of a collective implies that they must also lack, or possess in greatly distorted form, the basic features of a collective. The artel form of co-operative seemed best adapted to the specific requirements. The TOZ were definitely unacceptable because they collectivized only a relatively small portion of the peasants' activities, and their output would therefore be too small to insure the quantities the state wanted to obtain from the collectives. The TOZ member was also insufficiently dependent on his kolkhoz to make sure that he would work for it if the reward was too small. The TOZ were, moreover, inacceptable politically because the peasants joining them did not cease to be independent producers, anathema in the Soviet brand of socialism.

Before the start of the drive the communes had proved, even to the satisfaction of the Party, that they could exist only when heavily subsidized. But taking rather than giving was the aim of the big drive. To force one hundred million peasants into communes may also have been considered impossible.

Thus the artel was finally chosen. The means of production left with the kolkhozniki in the artel were so small that the products obtained from them would have to be supplemented by distributions from the kolkhozy. The inadequacy of their personal production seemed to insure that the kolkhozniki would work for the kolkhozy in order to earn the balance of the irreducible minimum they needed.

[1] *Most Important Decisions on Agriculture*, State Publishing Office of Kolkhoz and Sovkhoz Literature (2d ed., Moscow, 1935), p. 403.

THE CHARTER

As a co-operative, each kolkhoz is supposed to have a charter. In actual practice the model charters released by the Central Government act as the charter of each artel. No model charters have been released for the communes and TOZ since the early post-Revolution days and nobody apparently cares how the few remaining kolkhozy of these types function. Everybody indeed acts as if no other kolkhozy but arteli exist.

The "Model Charter of an Agricultural Artel" dated March 1, 1930 was very short, and gave only a rather vague design of the kolkhoz organization. The organization forms were fully developed only after millions of households had been drawn into the kolkhozy. The artel in a form close to that in which it functions today is set forth in detail only in the Model Charter of an Agricultural Artel approved in 1935 (also called the Stalin Charter). The adjective "model" does not imply that deviations are permitted. The charter functions as law.[2] Translations of both charters have been made by Hubbard.[3]

Only a few regulations of the Model Artel Charter are considered here. For others the reader is referred to the text of the charter and to the comments in Hubbard's book.

MEMBERSHIP[4]

The Model Artel Charter of 1930 (Article 6) provided for individual membership in the kolkhoz by all persons over sixteen years of age. Ivanov commented on the principle of individual membership thus: "This is natural, because the peasant household represents a relic of serfdom which must disappear. There is no place for a household, as the primary unit, in the socialist economy."[5] The Model Charter of 1935, now in force, similarly prescribes: "All working people who have reached the age of sixteen years are eligible to become members of the kolkhoz." Individual membership implies the right to participate in the

[2] A. Uralsky, "The Basic Law of Construction of the New Society in the Village," *Problems of Economics*, March 1940, p. 30.

[3] L. E. Hubbard, *Economics of Soviet Agriculture* (London, 1939), pp. 125–27 and 131–46 respectively.

[4] Dr. V. V. Gsovsky of the Library of Congress was consulted on the legal status of individual kolkhoz members and kolkhoz households.

[5] Y. N. Ivanov, *Accounting of Labor in Kolkhozy* (Moscow, 1931), p. 49.

assembly of the members, to work in the kolkhoz, and to receive a share in its proceeds. Each member is individually responsible for performing the minimum amount of work for the kolkhoz, since this has been ordered. Otherwise, however, the household has remained the economic unit within the kolkhozy.

As time passed, the household not only did not disappear but became increasingly alive. Indeed, only the number of households is given in all the direct data on kolkhoz membership since 1930 that have come to the attention of the writer. Garden land is allotted to households rather than to kolkhoz members. The same is true of the regulations regarding the amount of livestock that the kolkhozniki may have. Obligatory deliveries of kolkhoz peasants likewise are assessed per household, and even the agricultural tax is computed and payable in this way. Thus another fond hope has disappeared into thin air.

The Charter of 1930 (Article 7) prescribed that peasants who slaughtered or sold their livestock and disposed of their implements before applying for membership in an artel should not be admitted. This rule was modified in the Model Charter of 1935 as follows: "Peasants who sold their horses less than two years before being admitted to an artel, and who possessed no seed, must within six years repay to the artel out of their income the price of a horse and of a certain quantity of seed."

The Charter of 1935 (Article 7) still specifically excludes from membership the kulaki and all persons deprived of civil rights, although the kulaki had been declared liquidated as early as 1930.

Those voluntarily quitting the kolkhoz or who are expelled from it have no claim for a share in the land (Article 7 of the 1935 Charter). They also lose their entrance fee, equivalent to 20 to 40 rubles per household, and 25 to 50 percent of their other property ceded to the kolkhoz. Like the entrance fee, this property had become part of the indivisible kolkhoz fund. Such members, moreover, have no claim to a share in any accumulations made by the kolkhoz during their membership. With the currency inflation as great as it is in the USSR, leaving the kolkhoz voluntarily or otherwise means losing everything except the property owned individually.

Before the Revolution, the peasants, in their highly desirable migrations to less densely populated areas, were greatly helped in re-establishing themselves by the proceeds from the sale of their property. The socialization of the land, part of the Revolution, put a substantial restraint on migrations because the peasants were not permitted to sell their share of the land. After collectivization, the means which they could mobilize for resettlement became even more inadequate, and migration had to depend almost entirely on government financing.

According to the Charter of 1935 acceptance and expulsion of members is to be effected by the assembly of the members (Articles 7 and 8). There is ample evidence, however, that members are expelled by kolkhoz chairmen, on their own initiative or by order of all kinds of local Party and government officials. Also, the membership is frequently enlarged by moving in new settlers. There is even a special term for this practice—*dopriselenie*, an additional settlement. The kolkhoz assembly is not consulted.

MANAGEMENT

According to the 1935 Charter, the affairs of the artel are to be managed by the assembly of the members and, between assemblies, by the board (Article 19) elected by the assembly for two years (Article 21). The assembly also elects a member to act as chairman of the artel, the board, and the board of controllers (Articles 20, 22, and 25). The board appoints an assistant chairman (Articles 20 and 22), a bookkeeper (Article 14), and, for not less than two years, the field brigadiers and the managers of the kolkhoz fermy (Article 23). All this of course is merely the container: it is the wine that matters.

The real purpose of the kolkhoz is embodied in Article 6 of the 1935 Charter: "The artel pledges to conduct its collective economy according to plan, punctually performing the plans of agricultural production set by the Worker-Peasant Government, and the obligations of the artel toward the state." A vast government and Party organization has been created to see that these plans and obligations are punctually fulfilled. The kolkhoz chairman and the boards are merely the lowest administrative

parts of a machine with its center in Moscow. All details as to what and how the kolkhozy are to produce are worked out in Moscow and passed down the line to the kolkhoz.

A new refinement of the mode of bringing the plan down from Moscow was carried through on a country-wide scale for the first time in 1947. A letter is written (possibly in Moscow) to Stalin himself from the kolkhozniki, workers and employees of the MTS and sovkhozy, and agricultural experts of each republic or oblast. This is prepared in strict conformity with the plan. A typical letter began: "Our dear father, leader and teacher, comrade Stalin . . . ."[6] In a letter from Kazakhstan,[7] after profusely expressing their endless devotion, love, and gratitude to the great leader for his unceasing care for the well-being of the Fatherland, and specifically for its salvation from the enemy, and declaring that "our eternal hopes for free joyous work on free land are realized,"[8] the above-mentioned groups of persons solemnly pledged themselves to fulfill the plans for the specified year. Fulfillment of obligatory deliveries on schedule or even ahead of schedule is foremost among the pledges. There follow page-long highlights, even with names of kolkhozy, brigades, and squads. Each letter contains a statement that the letters have been approved by meetings of persons making the pledge. A little later the cry is raised that pledges to the beloved leader are sacrosanct, and must be fulfilled at all costs.

The deprivation of the kolkhozy of any right to decide on their activities is brought out in the following quotation from Shepilov (1940):

> Until the present time [referring to an order of the government and Party dated December 28, 1939[9]] the plan for each crop separately was obligatorily passed to the kolkhoz. Now the plan for grain is passed to the kolkhoz with separation into winter and spring grains. Within this general plan each kolkhoz is permitted to distribute the planned amounts among the individual kinds of grain, taking into consideration soil, climate, economic conditions, and the accepted rotation. The obligation of the kolkhoz to deliver to the state specified kinds of grain in specified amounts remains in force.[10]

[6] *Pravda*, Aug. 31, 1947.
[7] *Socialist Agriculture*, Apr. 23, 1947.
[8] On the price paid by the Kazakhi for collectivization see the end of the preceding chapter.
[9] *Most Important Decisions on Agriculture of 1938–40* (Moscow, 1940), pp. 231–33.
[10] D. Shepilov, *Socialist Kolkhoz Property* (Moscow, 1940), pp. 104–05.

For example, a kolkhoz in an area unadapted to wheat may decide to cut its wheat planting to half the area on which the delivery plan for that kolkhoz had been based, and to replace the other half with rye. It will then have to deliver twice the normal quantity of wheat per hectare. No wheat may remain for the kolkhozniki, and in case of a bad harvest there may even be a deficit.

As the foregoing quotation indicates, on crops other than grains the kolkhozy have not had even the small leeway that they were given with reference to winter and spring grains by the order of December 28, 1939—and this privilege was withdrawn by the February 1947 decision of the Party. They have practically nothing to say about the livestock they keep and the animal products they produce. The plans settle all those matters.

Although the MTS normally work on "contracts" with the kolkhozy, the latter have little or no voice in the operations to be performed by the MTS on their fields. The kolkhoz must provide the auxiliary man and draft power and try, as best it can, to perform operations which should have been but were not performed by the MTS. Even for these it needs permission. An order of June 13, 1945 on the harvest and procurements in 1945 permitted the kolkhozy "to harvest grain with simple machines and by hand, even though a certain lot had been scheduled to be harvested with the combine, if the crop is ripe and the combine has not been delivered to the kolkhoz or is in disrepair." The kolkhozy and their chairmen have more or less discretion only over operations performed without participation by the MTS.

The distribution of the returns is strictly regulated by the Charter and by numberless decrees, orders, etc.—against the interests of the members (see pp. 363 ff.).

Samotek vs. guidance.—Leadership, guidance, and all-pervading control of the kolkhozy by the Party and government officials—the reverse of "samotek"—are part of the system and are urged unceasingly. A favorite quotation from Stalin runs thus:

> The transition to collective economy . . . . does not diminish, but increases our care for agriculture, does not diminish but increases the leading role of the Communists with reference to the enhancement of agriculture.

Now *samotek* [natural flow] is more harmful than ever for the development of agriculture. *Samotek* will ruin everything.[11]

Leadership naturally leads to full subordination of the kolkhoz and kolkhoz officials to those entrusted with the leadership. An unavoidable step from here is lawlessness, misuse of power in the "public" interest and also for private benefit. A standard practice is that local officials force the kolkhozy to deliver their produce to them at low or token prices. All the rights of the kolkhoz assemblies, even that of electing their chairmen and boards, are largely on paper. The chairmen, the real bosses of the kolkhozy, are repeatedly shifted on orders of those higher up. Although they are powerless to resist pressure from the outside, the chairmen are excessively independent of the kolkhoz members. Appropriation of kolkhoz land and other properties, favoritism in distributing jobs, indeed the creation of fictitious jobs—all these are everyday occurrences.

The twenty years of new-era kolkhozy have witnessed several attempts to establish leadership without its inevitable consequences. As early as June 25, 1932, in an order on the Revolutionary law, the government and Party ordered the local authorities of the soviets and the state attorneys to prosecute unremittingly officials guilty of violating such basic principles of the kolkhoz organization as had to do with the election of the boards and other officials of the kolkhozy, or with their money funds, and their land, and for other malpractices.[12] The order of the government and Party of April 1938, "On Incorrect Distribution of the Income in Kolkhozy," aimed at preventing the same abuses.

Yet the order of the government and Party of September 19, 1946, "On Measures to Eliminate Violations of the Charter of the Agricultural Artel in Kolkhozy," speaks of almost the same violations as its predecessors, in terms that indicate long-run, deep-rooted weakness. Specifically enumerated are: unlawful spending of trudodni, misappropriation of collectivized land of the kolkhozy, theft of kolkhoz property, abuses of raion and other Party and Soviet officials, abuse of the self-government

[11] Here quoted from N. Anisimov, editor of *Socialist Agriculture*, "Stalin Charter of the Agricultural Artel—Basic Law of Kolkhoz Life," *Socialist Agriculture*, Sept. 26, 1946.

[12] *Most Important Decisions on Agriculture* (2d ed.), p. 64.

rights of the agricultural artel—the right to elect the board and chairman, and the responsibility of the latter to the assemblies of the kolkhozniki. Speedy investigations all over the Union, prescribed by this order, brought to light an amazing amount of abuse and misuse. A mass of property of all kinds, unlawfully taken from the kolkhozy, including almost six million hectares of land, was returned to them.

This time it was decided not to limit the action to a cleansing campaign of a few weeks or months. Under the order a permanent Board on Activities of the Kolkhozy was to be attached to the government of the USSR to insure the fulfillment of the order's terms. This Board is headed by A. A. Andreev, the "boss" of Soviet agriculture, and has its controllers in the several republics, kraya, and oblasti. However, the Party decision of February 1947 calls for even more guidance of the kolkhozy than before, specifically Party guidance. The roots of all abuses and misuses remain untouched. The controllers of the new Board may turn out to be one more agency liable to commit abuses and misuses.

Padding of administration.—Among other abuses of kolkhoz life, the September 1946 order speaks of "unneeded and invented jobs in kolkhozy in which rascals and idlers who avoid productive work conceal themselves." The law elaborates as follows:

> Incorrect distribution of trudodni is brought about in the kolkhozy by the padding of administrative personnel and excessive expenditure of trudodni. . . . .
>
> Incorrect utilization of labor by unjustified excessive padding of administrative personnel has brought about in many kolkhozy a shortage of able-bodied persons for work in the field and the livestock fermy, whereas in auxiliary jobs are many persons doing nothing and receiving a higher payment than those on productive jobs.

In a few months, in fulfillment of this order no less than 600,000 jobs were liquidated in the kolkhozy and the persons involved turned to productive work.

Such padding had nothing to do with the war. It began at the birth of the forcibly enlarged kolkhozy. One may also doubt that all the jobs liquidated were superfluous. The endless requests for all kinds of accounting, ascertaining, and reporting

necessarily lead to expansion of the administrative personnel. The need for finding excuses for the failure of the kolkhozy to become efficient gives use for another "job." In any case, profusion of administrative personnel is only one factor in the kolkhoz labor shortage and only a minor one. The all-round inefficiency of labor is the primary cause (see chapter xviii). The swelling of the administrative personnel is overemphasized because stressing the true reasons for labor shortage would be equivalent to acknowledging the failure of the kolkhoz idea, Soviet style.

Fluidity of personnel.—A good illustration of the poor functioning of the apparatus of the kolkhozy is the fluidity of their personnel, which in itself would be enough to prevent efficient operation of the kolkhozy. On January 1, 1939 out of a total of 236,836 kolkhoz chairmen, 114,499 had been on their current jobs less than one year. The corresponding figure for the field brigadiers was 243,832 out of a total of 554,077, and for brigadiers of kolkhoz commercial livestock fermy, 29,969 out of a total of 65,039.[13] During 1938, 54 percent of all kolkhoz chairmen, 62 percent of all brigadiers, and 63.9 percent of all brigadiers of livestock fermy had changed their positions.[14] There are no indications of improvement in these respects since 1938.

Such orders as that prohibiting the "assignment of managers of fermy to other jobs without permission of the raion agricultural offices"[15] had no effect. The requirement that the field brigades be responsible for their fields during the entire rotation, lasting 7 to 10 years (Model Charter 1935, Article 14), is only a joke under such conditions.

LABOR FORCE

The management of the kolkhoz, and specifically the utilization of its labor, was relatively simple so long as the kolkhozy consisted of 10 to 20 neighboring households, though even then much was left to be desired. Complications multiplied when

[13] V. Chuvikov, "Organization and Payment of Labor in Kolkhozy," *Socialist Agriculture*, May 1940, p. 20.

[14] *Ibid.*, p. 19.

[15] Resolution of the Party of July 1, 1934, "On Improvement and Expansion of the Animal Husbandry," *Most Important Decisions on Agriculture* (2d ed.), p 372.

almost overnight the average membership of each kolkhoz was increased sixfold. No one was prepared to face the situation. The new large kolkhozy resembled big flocks without shepherds. The 25,000 city workers sent to act as kolkhoz chairmen and other functionaries, in accordance with a Party order of November 17, 1929, were probably worse than no shepherds at all.

In the decision of the VIth Congress of the Soviets of March 17, 1931, one reads:

> The principal and most harmful defects in the operations of the kolkhozy in 1930 were, first, the distribution of the kolkhoz income not by the amount and quality of the work of the kolkhoz members, but in proportion to the number of persons in the household, and, secondly, inefficient and poor organization of the work, especially during the harvest.

The same decision stated that, owing to the poor organization, "part of the kolkhoz harvest was lost in a number of cases." But its only suggestion regarding the organization of labor was the recommendation to take care to create experienced cadres of leaders of the productive enterprises of kolkhozy. Brigadiers were enumerated among these.

The brigade itself appeared in a resolution of a central agency for the first time in the Party decision of February 4, 1932. This declared the brigade, with the membership attached to it for the whole season, the most important link in the organization of field work in the kolkhozy.[16] "The kolkhozy provide the brigades for the whole period of operations with the necessary machinery, implements and workstock, for the condition of which the brigade is responsible in full." The principle of the brigade was also to be extended to the various livestock enterprises, each one operating as a brigade. The formation of brigades within each livestock enterprise was recommended later. The field brigades were to have the land for the whole rotation.

In 1937, 65.1 percent of all kolkhozy had two or more field brigades, and all kolkhozy averaged 2.2 field brigades.[17] The livestock kolkhoz fermy, however, were in general too small to be split into brigades. Of the cattle, hog, and sheep kolkhoz

[16] *Most Important Decisions on Agriculture* (2d ed.), p. 429.

[17] *Kolkhozy in the 2d Stalin Five-Year Period*, Gosplan (Moscow, 1939), p. 49.

fermy, only 1.6, 1.1, and 1.1 percent respectively had 2 or more brigades in 1937.[18]

The brigade averaged as many as 62 persons in 1937; in the Middle and Lower Volga region the average was 102.[19] Shortly after their establishment as a permanent institution, it became clear that they were not the full solution of the problem of proper labor organization, especially in operations on technical crops, potatoes, and the like. The organization of squads of 5 to 7 workers for the performance of all operations on specified lots in sugar beets was recommended by an order of the government and Party of May 27, 1933. The squad principle was then extended to several other technical crops as well as potatoes and vegetables, and in 1938 to millet also.

The resolution of the XVIIIth Congress of the Party approving the 3d Plan (March 20, 1939) called for "the wide adoption of the squads in the kolkhozy." A survey made in the middle of 1939 showed that 65.6 percent of the investigated kolkhozy had squads, and that the acreage assigned to these amounted to 37.4 percent of their total cropped plowland.[20] Since the squad principle was particularly important for row crops, this percentage implied a more general adoption of the principle than might appear at first glance.

While the squads usually consisted of 6 or 7 persons, including some relatives, even this unit was finally considered too large. Indeed, the desirability of individual responsibility for specific operations was recognized even before the squad principle was established. According to an order of the government and Party of February 10, 1933, every pair of horses in the brigade was to be assigned to one kolkhoznik for the whole period of field operations. Similarly, it gradually became standard practice for each milkmaid to tend the same cows permanently. They were back where they started when, in certain fiber-flax kolkhozy, the "boards of the kolkhozy assigned lots of fiber-flax measuring 1.5 to 3 hectares to individual peasant families."[21] Later the practice of assigning individual lots for

[18] *Kolkhozy in the 2d Stalin Five-Year Period*, p. 51.

[19] *Ibid.*, p. 49.

[20] *Socialist Agriculture*, May 1940, p. 14.

[21] A. Moryganov and Z. Logak, "Of Experiences with Fiber-Flax Squads," *Socialist Agriculture*, January 1939, p. 65.

a season was recommended by the government first for kok-sagyz (a rubber plant) and then for oilseeds, tobacco, and makhorka. Advanced kolkhozy are supposed to apply it to all labor-intensive crops.[22]

The assignment of squads and individuals to specific crops had its counterpart in the splitting of fields into small units that largely defied the purposes for which the compulsory enlargement of the kolkhozy was undertaken. Furthermore, since the specific jobs did not always require all of the time of the assigned persons, labor deficiencies arose for work not specifically assigned. Shekhovtsov reported in 1940: "The experience of the kolkhozy showed the serious disadvantages of specialized squads. A squad organized in the brigade for one crop, frequently cannot handle it at peak time. . . . . On the other hand, the specialized squads do not utilize their labor fully."[23] A Russian saying, "Out of a fire into a blaze," fits the situation well.

Despite the obstacles, small-squad and individual responsibility gained momentum even during the war, in kolkhozy as well as in sovkhozy.[24] It seems rather odd for each worker in a large sovkhoz to be assigned a few rows of cotton, sugar beets, or potatoes, and for each such tiny lot to be separately tended, harvested, and accounted for. At this writing individual responsibility is the most favored topic, second only to obligatory deliveries. This is clearly reflected in Anisimov's somewhat belated (1947) designation as new of the "trend toward the highest possible individualization in the work of the kolkhozniki."[25]

Other facets of labor utilization, especially its aspect from the point of view of the workers, are discussed in chapter xvii.

[22] *Problems of Organization of Kolkhoz Production* (2d ed., Moscow, 1946), pp. 90–91.

[23] A. Shekhovtsov, "Squads in Kolkhozy," *Socialist Agriculture*, August-September 1940, p. 47.

[24] A. P. Teryaeva, *Labor in Kolkhozy during the Great Patriotic War* (Moscow, 1947), pp. 57 and others; and I. E. Kantyshev, *Sovkhozy under Conditions of the Great Patriotic War* (Moscow, 1946), p. 34.

[25] N. I. Anisimov, *The Victory of Socialist Agriculture* (Moscow, 1947), p. 105.

CHAPTER XV

KOLKHOZY: PROPERTY COLLECTIVIZED AND OPERATIONS

In choosing the artel as practically the only form of kolkhoz in the great collectivization drive, the government was clearly expressing its decision to make the collectivized (kolkhoz) economy pre-eminent and to submerge the economy of the kolkhoz members.

While it was decided from the very start not to permit the economy of the kolkhozniki to be more than subsidiary, considerable changes took place in the scope either desired or permitted. The changes involved the whole private economy of the kolkhozniki, but were particularly marked with reference to livestock. The first impulse was to collectivize virtually everything, but the peasants responded to this, among other ways, by annihilating their livestock. It soon became obvious, also, that the kolkhozy were unable to handle all their business, and were especially helpless in caring for all the livestock that came their way. The extreme shortage of all farm products forced a more lenient attitude toward the individual economy of the kolkhozniki; ultimately the policy was even embarked upon of vigorously promoting kolkhoznik livestock as the principal means of rehabilitating the greatly depleted herds.

A new reversal came in or about 1938, when a shortage of labor for the kolkhoz work began to develop and the combined livestock of the kolkhozy and kolkhozniki started to outgrow the limited feed resources. The kolkhoznik enterprises were increasingly looked upon as competing with, rather than supplementing, the kolkhoz economy, and strong brakes were ultimately put on them. That important change was even reflected in the official language. Until 1938 the standard formula was: the economy of the kolkhozy is the *principal* one, that of the kolkhozniki the *subsidiary* one. In his speech to the XVIIIth

Party Congress in March 1939, Andreev said that the subsidiary economy of the kolkhozniki must become *ever more subsidiary.* Finally a leader in the June 1939 issue of *Socialist Agriculture* (p. 20) spoke of the economy of the kolkhozy as the *decisive* one and that of the kolkhozniki as the *narrow-subsidiary.*

LAND

Kolkhozy.—One official source gave the land permanently held by the kolkhozy in 1938 at 368.7 million hectares.[1] According to another source, the kolkhozy held in the same year permanently and temporarily 549 million hectares, subdivided as follows (in million hectares):[2]

Arable land	182
Meadows	41
Pastures	157
Forests	91
Others	78

The transfer of about 20 million hectares of sovkhoz land to the kolkhozy in 1935–37 has already been mentioned (chapter xi, p. 257).

In 1938 the collective farms had 85.6 percent of the total cropped plowland. Their share in cropped meadows was about 80 percent, but their meadows were better on the average than the rest. Their share was lowest in pastures.

According to Article 8 of the Stalin Constitution and Article 2 of the 1935 Artel Charter, the land occupied by the kolkhozy is assigned to them indefinitely, i.e., forever, and gratis.[3] Henry Wallace says, however:

> The government owns the land, but the collective farm has a lease in perpetuity to the land. In return for this lease and for the tractors and combines furnished by the government tractor stations, the collective farm is obligated to seli 60 percent of its grain to the government at one-fourth its market value.[4]

While the share of the state in the grain crop and the price of the delivered grain were stated wrongly, Wallace naïvely divulged what is known to everybody in the USSR but would be heresy

[1] *Kolkhozy in the 2d Stalin Five-Year Period*, Gosplan (Moscow, 1939), p. 9.
[2] *Socialist Agriculture*, February 1940, p. 8.
[3] See comments by D. Shepilov, *Socialist Kolkhoz Property* (Moscow, 1940), p. 55, and many others.
[4] H. A. Wallace, *Soviet Asia Mission* (New York, 1946), p. 225.

to utter, namely, that the state exacts a high rent for the land, most of which was the peasants' property even under the Czar.

There is ample evidence that the kolkhoz land is shifted around, taken away, or added, without bothering to ask the kolkhozy involved. Sokolovskii mentioned such cases as a matter of course in connection with the growing of sugar beets in central Asia. He said, for example: "In Alma-Achinsk oblast, land of the kolkhozy of the Karatalsk MTS was assigned to the kolkhozy of the Ustabinskii MTS."[5]

Kolkhozniki.—The land lying under the dwellings and their adjacent vegetable and fruit gardens was traditionally held by the peasants individually, and was not subject to periodical redistribution even where arable land and meadows were repartitioned. The Model Artel Charter of March 1, 1930, prescribed the collectivization of the arable land only:

> All boundaries separating the arable holdings of the members of the artel shall be removed. No land can be withdrawn from the pool by a member leaving the artel. Those leaving the artel can obtain land only from the State Land Fund.

Thus the peasants who joined the kolkhozy retained the land under the dwellings and adjacent gardens in their own right. This was later changed. The Model Artel Charter of 1935 (Article 21) ordered: "A small lot adjacent to the dwelling is separated from the collectivized land for each member as vegetable and/or fruit garden." This regulation implies that the garden land was also subject to collectivization and that the kolkhoz only permits the members its use. However, even the 1935 Charter does not make any claim in favor of the kolkhozy to the land under the dwelling houses of the kolkhozniki.[6]

The lots in gardens of the kolkhozniki may vary from one-quarter to one-half hectare, and in individual regions be up to one hectare (1935 Charter, Article 2). The larger gardens are permitted in areas where land is less valuable and also less adapted to crops that are conveniently grown in gardens.

On January 1, 1938, 2.3 percent of the kolkhoz land, or

[5] P. Sokolovskii, "On Measures in Connection with Sugar-Beet Growing in Irrigated Districts," *Socialist Agriculture*, April 1944, p. 46.

[6] The latest interpretation is that the land under kolkhoznik non-dwelling buildings is part of the garden land and hence kolkhoz land.

about 8.5 million hectares, were in the gardens of the kolkhozniki. The average per household was 0.49 hectares, or about 1.2 acres. In West and East Siberia the averages were 0.70 and 0.81 hectare respectively; in the Central Industrial Region, only 0.39 hectare.[7]

In the order of May 27, 1939, "On Measures toward Safeguarding the Collectivized Land from Being Squandered," the Party and government recognized with disgust "the presence of serious distortions of the policies of the Party with reference to the utilization of the kolkhoz land." It continued:

> The squandering and robbery of the collectivized land in favor of the individual enterprise of the members occurs in the form of all kinds of unlawful additions to their gardens above the limit permitted by the Model Artel Charter . . . .

The strong measures prescribed by the order led to the disclosure that 2,564,000 hectares of kolkhoz land were in unlawful possession of others. But these included to a large extent state organizations such as railways. Unlawful possessions by the kolkhozniki were mostly in tiny lots. For example, in Gomel oblast, 13,474 culprits were found to hold a total of 1,707 hectares, or an average of ⅛ of a hectare each.[8]

Among the measures prescribed by the stated order was the affirmation of the prohibition of renting the kolkhoznik allotments, under penalty of expulsion from the kolkhoz in addition to loss of the allotment. Shepilov cited the serious crime of a kolkhoz woman in a suburban kolkhoz of the Alma-Ata raion who "sold" such an allotment of 0.3 hectare for 3,000 rubles obviously because in the absence of a man worker she was unable to make use of the privilege she was earning by hard work.[9] The garden lot, after all, is an important part of the payment for work for the kolkhoz.

The order of the Party and government "On Measures to Eliminate the Violations of the Charter of the Agricultural Artel," dated September 19, 1946, renewed the drive against squandering kolkhoz land. This time, however, it was found

[7] *Kolkhozy in the 2d Stalin Five-Year Period*, pp. 9 and 11.

[8] All data in this paragraph from D. Shepilov, *op. cit.*, pp. 55–64.

[9] *Ibid.*, p. 57. Incidentally, the price is a good indication of both the degree of inflation and the land hunger brought about by the collectivization.

that the kolkhozniki held unlawfully only 521,000 hectares.[10] The great importance assigned to the task of depriving them of this land indicates the continued weakness of the kolkhoz system.

We have seen that primarily those khutory and otruba (peasant land holdings separated from the communal land in accordance with the Stolypin laws; see page 154) which had proved their worth even before the Revolution, survived the post-Revolution land confiscations and repartitioning. Pershin wrote in 1921:[11]

> In northern gubernii (Perm, Vyatka, Yaroslavl, Novgorod, etc.) and certain central gubernii (as, for example, Orel, Tula, Moscow, Kaluga), where the separated farms (khutory and otruba) had time to develop, to acquire a cultured nature by including rotation grass and complicated rotations, and by improving their animal husbandry, it is recognized as necessary to preserve these farms and to prevent the attempts to liquidate them.

The order of May 27, 1939 nevertheless prescribed the final liquidation of all remnants of the Stolypin reform, and this action was hailed as a great achievement. All land held by the kolkhozniki which was not adjacent to the villages was to be taken away and replaced by other land. The peasant dwellings located on lots separated for them from the communal land, i.e., outside of the villages, were to be torn down by September 1, 1940. There was no provision for compensation. According to Shepilov, over 450,000 households were moved to the villages in the Union within a year after "the May decision of the Party,"[12] but the job was not completed when he wrote.

MACHINERY

The Artel Charter of March 1, 1930 included farm machinery among the collectivized items. The Charter of 1935 felt it necessary to add that simple implements needed for work in the gardens of the members were to be left to them.

The next step after expropriating the machinery from the peasants for the kolkhozy, was to expropriate it from the kol-

[10] Andreev's report to the Party of February 1947.

[11] P. Pershin, "Forms of Land Tenure," *On Land*, ed. by a Committee of the Commissariat of Agriculture, RSFSR (1st issue, Moscow, 1921), pp. 70–71. Pershin did not mention the west because he wrote only of the RSFSR.

[12] Shepilov, *op. cit.*, p. 61.

khozy for the state. The transfer of ownership of tractors and most other machinery from the kolkhozy to the MTS has been discussed on pages 278–79.

Investment of the kolkhozy in machinery at the end of 1937 was officially stated as follows (in million current rubles): tractors, 35; trucks and automobiles, 464; non-mechanical means of transportation, 966; other machinery and implements, 1,058; total, 2,548.[13]

No data on the machinery owned by the kolkhozy in physical units has been published. Around 1938 the kolkhoz power machinery consisted of a few thousand tractors (all of them certainly obsolete), perhaps 50,000 trucks, and a small number of automobiles. The non-mechanical means of transportation comprised millions of old-fashioned two- and, mostly, one-horse wagons with a capacity of 900 to at the most 1,800 pounds. The other machinery consisted of implements drawn by horses and oxen. Since Russian horses are small, and big teams are uncommon, one-bottom plows and corresponding sizes of other equipment are the standard. Of other machines owned by the kolkhozy, grain mowers, most of them without attachment for laying the cut grain in swatches, were the most expensive.

LIVESTOCK

Kolkhozniki.—The collectivization drive was particularly chaotic as it applied to livestock. The 1930 Artel Charter (Article 4) said:

> To be collectivized: All workstock . . . . In households with one cow the dairy cattle are not collectivized. In households with more than one cow, one cow is left, the balance [is] collectivized. . . . . Collectivization of small livestock, i.e., hogs and sheep, is effected in areas producing these types of animals (or their products) for the market; a certain number of small animals, according to the decision of the board of the artel, is left with the members. In regions where these types of animals (or their products) are not produced for the market, hogs and sheep are not collectivized. Poultry is not collectivized. But where practical, collective farms should organize small-livestock and poultry enterprises.

The statement of the government (p. 306) to the effect that "in 1930–31 not less than two-thirds of the livestock in kolkhozy will be collectivized," i.e., will be the property of the kolkhozy

[13] *Kolkhozy in the 2d Stalin Five-Year Period*, p. 13.

proper, obviously did not imply an expectation that the stipulation of the 1930 Charter would be fulfilled. Numerous government documents, especially those issued after irreparable damage had been done, testify that *all* livestock, even poultry specifically exempted, was to a large extent collectivized.[14] Also, one could not account for the striking disappearance of the livestock in those years if peasants had felt assured that the provisions of the Charter would be fulfilled. Even half of the poultry was gone in a couple of years.[15]

Unlimited collectivization of peasant livestock and its collateral, mass slaughterings, continued for a considerable time after warnings began to pour from the top. Moreover, no decisive change in the government policy toward the livestock of the kolkhozniki took place before 1933, although Y. A. Yakovlev, the Commissar of Agriculture, in his report to the government, had mentioned the return of excessively collectivized livestock to the members as early as 1932.[16]

The 2d Plan, approved February 10, 1934, even made the livestock of the kolkhozniki the foundation of a grandiose scheme of reconstruction of animal husbandry during the 2d Plan Period. The following increases, especially large in hogs, were scheduled for that category of owners (in million head, early-summer counts):

Type	Actual 1932[a]	Plan 1937[b]
Cattle	12.7	44.9
Hogs	2.9	27.1
Sheep and goats	14.6	53.5

[a] *Agriculture USSR, 1935*, p. 511.
[b] *2d Plan*, I, 239.

As compared with these increases, those planned for the sovkhozy (pp. 252–53) and for the collectivized livestock (pp. 349–50) were small. The goal for expansion of the collectivized

[14] See especially the Party decision of Mar. 26, 1932 in *Most Important Decisions on Agriculture*, State Publishing Office of Kolkhoz and Sovkhoz Literature (2d ed., Moscow, 1935), p. 430.

[15] The well-informed A. E. Arina and others (*Social-Economic Changes in the Village*, Moscow, 1939, p. 275) after having put the question "What were the reasons for the drastic curtailment of the livestock?" answered:

"First . . . . the peasants under the influence of kulak propaganda slaughtered a mass of livestock before entering the kolkhozy. The slaughtering was considerably fostered by the distortions in collectivization (collectivization of the last cow, of all small livestock and even poultry)."

[16] *Socialist Reconstruction of Agriculture*, February 1933, p. 33.

livestock indeed called for an increase of only 5 percent in cattle. In spite of the change in the government's attitude, no decisive break in the trend in livestock holdings of the kolkhozniki took place before 1935.

The Model Artel Charter of 1935 (Article 5) contains detailed regulations on the numbers of livestock permitted the kolkhozniki. Four groups of areas are distinguished. In the first group, which includes the grain, cotton, sugar-beet, flax, hemp, potato and vegetable, tea, and tobacco areas, and comprises the predominant part of agricultural Russia, the kolkhozniki are permitted per household: one cow, up to 2 head of young cattle, one sow with its offspring (or, if the board of the kolkhoz finds this necessary, 2 sows with offspring), up to 10 sheep and/or goats, unlimited numbers of poultry and rabbits, and up to 20 beehives. The corresponding maxima in other areas are higher to much higher than these standard ones, the highest being provided for the areas of seminomadic and nomadic animal husbandry. The households of areas with seminomadic or non-nomadic animal husbandry, where crop production is of small importance, are allowed to own 4 or 5 cows, unlimited young cattle, and 30 to 40 sheep and goats, 2 or 3 sows with offspring, as well as one horse or 2 camels, mules, or asses. The households of the nomadic areas are permitted to have 5 to 8 camels in addition to 8 to 10 cows, 100 to 150 sheep and goats, and 10 horses. Most of Kazakhstan, then bare of livestock, probably was to be classified as nomadic or seminomadic.

While the Charter permitted most of the kolkhozniki only very small livestock holdings, its provisions served as a kind of liberty charter. The situation in the early years of the drive was indeed so confused that it was possible to make the projected "one cow, one sow, and a few sheep per kolkhoz household" the object of highly advertised special campaigns and solemn promises. Stalin said at the meeting of shock kolkhozniki in 1935:

> One–two years will pass and you will not find one kolkhoznik who does not have a cow. We, Bolsheviks, will take care that each kolkhoznik has a cow.[17]

The most effective parts of these campaigns were sales of live-

[17] Joseph Stalin, *Problems of Leninism* (9th ed., supplement, Moscow, 1934), p. 60.

stock (exclusively very young animals) by the kolkhozy and sovkhozy to the kolkhozniki. This action had started in 1933, on orders of the Party and government of August 14 and November 5, 1933, "On the Assistance to Cow-less Kolkhozniki"; but the sales were very small in 1933 and 1934. The official count of all such sales for the period 1933–38 was as follows (in million head): calves, 6.7; piglets, 25.7; sheep and goats, 7.0.[18] While great publicity was given to those sales, silence prevailed as to the numbers of livestock contracted by the kolkhozy *from* their members. These purchases may well have exceeded the sales.[19]

The goals of the 2d Plan for the expansion of the livestock of the kolkhozniki were missed by wide margins, as indicated by the following figures (in million head):

Type	Goal June 1937	Actual Jan. 1, 1937	Actual Jan. 1, 1938
Cattle	44.9	22.2	25.1
Hogs	27.1	8.6	12.8
Sheep and goats	53.5	22.9	30.7

The seasonal increase from January 1 to June 1937 was small owing to the poor 1936 harvest. At the plan date there were only about half of the planned cattle and sheep and one-third of the hogs.

In the summer of 1938 the livestock herds of the kolkhozniki reached their highest point. Yet the solemn promise of one cow per household remained unfulfilled. A total of 18.5 million kolkhoz households owned 25.1 million cattle on January 1, 1938. Of these only 12.1 million were cows, while 6.8 million were calves below one year of age. The goal of providing the kolkhozniki with sources of meat was even farther from reality. All kolkhozniki owned 12.8 million hogs on January 1, 1938, of which less than 2 million were sows.[20] In addition, the kolkhozniki had 30.7 million sheep and goats, or less than two per household, and an unknown number of poultry.

The plan for 1938 provided for a considerable further

[18] *Socialist Agriculture USSR, 1938*, Gosplan (Moscow, 1939), p. 85.

[19] For data on such sales in 1939 and some later years, see below, pp. 347–48.

[20] The total number of sows amounted to four million, but the kolkhozniki owned less than half of all hogs and the proportion of sows in their herds was less than in the herds of other owners.

increase in the livestock of the kolkhozniki, by about 18 percent for cattle, 27 percent for sheep and goats, and 20 to 21 percent for hogs.[21] Instead, a downward trend started. Between January 1, 1938 and January 1, 1940 the cattle herds of the kolkhozniki declined 18.9 percent, the hogs 26.6 percent, and the sheep and goats 11.4 percent.[22] The decline probably continued in 1940 (see Table 65, p. 764).

The shift from a rising to a declining trend in the kolkhoznik livestock was the result of a change in government policy toward the livestock of the kolkhozniki. While the huge increases in collectivized livestock of the kolkhozy demanded by an order of the government and Party of July 8, 1939 (see pp. 356–57) were unrealistic, even a serious start toward complying with those demands implied the necessity of considerable cuts in the herds of the kolkhozniki. Andreev's speech to the XVIIIth Party Congress in March 1939 showed that the government was well aware of this consequence. Actually the decline in the holdings of the kolkhozniki that he spoke of as forthcoming had already started.

This decline would have occurred automatically since the kolkhoznik's claim upon the kolkhoz feed output came last. The increase in kolkhoz herds meant less feed for the kolkhoznik animals. But the Soviet government does a thorough job in such cases. Many a kolkhoznik has to rely on his kolkhoz for young stock, especially piglets, for raising. Sales of kolkhoz and sovkhoz livestock to the kolkhozniki therefore abruptly stopped while "purchases" of livestock by the kolkhozy from their members were stepped up. In 1939 there were purchased in this way 2.5 million cattle, 0.8 million hogs, and 2.8 million sheep and goats. The plan for such purchases in 1940 called for 1.62 million cattle, 0.42 million hogs, and 2.6 million sheep and goats.[23] Actually, 2,900,000 cattle were purchased in 1940 and the plan for purchases of cattle in 1941 called for 2,000,000. Last but not least, the delivery quotas of meat by kolkhozniki have been raised substantially since 1940 (see pp. 379–80).

[21] Based on data in *Socialist Reconstruction of Agriculture*, June 1938, p. 46.

[22] Calculated from data of S. F. Demidov in *Planned Economy*, April 1941, p. 19.

[23] I. Nechiporenko, "Collectivized Livestock of the Kolkhozy," *Problems of Economics*, July 1940, p. 93.

Priority of the kolkhozy for the feed, discontinuation of sales of young stock to the kolkhozniki, and continued purchases from them for the kolkhozy explain why the kolkhozniki were able to make up during 1939 only a small part of the decline in livestock caused by the 1938 drought. Moreover, on January 1, 1941, the cattle and hogs of the kolkhozniki were probably below even the low level of January 1, 1939 (see Table 65, p. 764). The development would have continued along this path even if the war had not started.

The "Great Patriotic War" was not considered a sufficient reason to reverse or postpone this policy, though the kolkhozniki made up the bulk of the army. On the contrary, the policy of increasing the collectivized herds at the expense of the kolkhoznik livestock was strengthened. In the nonmilitary zone as of January 1, 1942,[24] which had little more than 60 percent of all livestock before the war, the plan for 1942 called for purchase by the kolkhozy from their members of 2,300,000 cattle, an unstated number of hogs, and 2,300,000 sheep and goats.[25] A similar plan for 1943, but for an even smaller territory, provided for the purchase of 1,636,000 head of cattle. The provision for purchase of sheep and goats in 1943 was on a much lower scale, and no such provision was made for hogs, because the number of these animals held by the kolkhozniki had dwindled to a level which apparently seemed irreducibly low even to the Soviets.

Although livestock in the hands of the kolkhozniki was declining sharply, the burdensome delivery quotas for meat—set for them whether or not they possessed any livestock (see chapter xvi, p. 370)—apparently remained unchanged. Thus their livestock-depleting effect rapidly became stronger.

While collectivized cattle and sheep and goats in the territory never occupied continued to increase at least until 1943, and collectivized hogs were maintained (see below), the cattle and hogs of the kolkhozniki were cut by one-third or more from January 1, 1940 to January 1, 1943, and their sheep and goats declined by perhaps as much as two-thirds.[26]

[24] Uninvaded territory less areas close to military operations.

[25] The figures include the purchases from workers and employees in rural areas.

[26] Substantial declines are revealed by a comparison of the official plans for raising

In the territory occupied by the enemy the small number of stock saved by the kolkhozniki were used after liberation as the principal source for rebuilding the collectivized livestock. O. V. Lode, describing the situation in a raion of Moscow oblast in 1942 wrote: "All young stock from saved cows, sheep, and hogs was contracted for the kolkhoz fermy."[27] And again, with reference to 1943: "As last year, the kolkhozniki have to the last man contracted the young stock from their private stock for delivery to the kolkhozy."[28]

The 4th Plan projects large increases in total cattle and sheep as compared with prewar, and a small increase in hogs. It also calls for a great expansion of collectivized livestock (see below, p. 352), and a more moderate increase in the sovkhoz livestock (see p. 268). But the private productive livestock—that of the kolkhozniki, individual peasants, and workers and employees—is not scheduled fully to reach the 1941 level (the difference would be even larger as compared with 1938; see Table 26, p. 350). Since the total livestock goal cannot possibly be fulfilled, and the greatest degree of underfulfillment will be on the part of individual owners, the holdings of the kolkhozniki in 1951 are likely to be far below even those of 1941.

Kolkhozy.—In the beginning of the drive the only concern over livestock was to collectivize. No one thought of what would happen to the animals. Chart 23 (p. 351) shows that collectivized horses and cattle actually declined from 1931 to 1934 in spite of continued acquisition of stock from the newly collectivized peasants. This is not surprising if one considers that in July 1932, for example, there were only six colts for each 100 kolkhoz horses. Even in commercial kolkhoz fermy, where the stock was possibly getting a little better care than other kolkhoz livestock, 29.7 percent of all calves born in 1932 died in that year.[29]

The 2d Plan, which concentrated on increasing the livestock (especially cows) of the kolkhozniki, was relatively modest in

young stock by the collective members in 1942 (*Izvestiya*, Mar. 13, 1942) and in 1938. Certain other government documents were considered in arriving at the estimates in the text. Space limitations prohibit giving details.

[27] O. V. Lode, *Rebirth of the Kolkhozy* (Moscow, 1943), p. 39.

[28] *Ibid.*, p. 42.

[29] *Agriculture USSR, 1935*, Commissariat of Agriculture USSR (Moscow, 1935), p. 582.

TABLE 26.—INDIVIDUALLY OWNED LIVESTOCK IN THE USSR, 1938, 1941, AND PLAN FOR 1951*

Territory and date	Horses	Cattle	Hogs	Sheep and goats
	Million head			
Prewar territory				
Jan. 1, 1938	1.8	32.4	16.6	36.8
Jan. 1, 1941	1.4	24.5	11.2	36.8
Added territory (est.)				
Jan. 1, 1938	4.0	8.5	6.5	7.0
Jan. 1, 1941	3.7	7.5	5.7	6.3
Postwar territory				
Jan. 1, 1938	5.8	40.9	23.1	43.8
Jan. 1, 1941	5.1	32.0	17.1	43.1
Goal, 1951	3.8	32.5	15.8	42.0
	Percent of total herd of postwar territory			
Jan. 1, 1938	28.7	68.9	71.7	59.5
Jan. 1, 1941	23.9	58.1	60.6	46.9
Goal, 1951	24.8	49.8	50.6	34.6

* Individually owned livestock includes that of kolkhozniki, individual peasants, and workers and employees. Figures for the old territory in 1938 and 1941 are from Table 65, p. 764. Prewar figures for the added territories are estimated. The goals for 1951 were obtained from the totals given in the 4th Plan, by individual republics, by subtracting the goals of the Plan for the sovkhozy and kolkhozy. No data for the kolkhozy in the Baltic States and Moldavia were given in the source, and it is uncertain whether the estimates of collectivized livestock in the other republics in part composed of new territories include estimates for collectivized livestock which those republics are expected to have by the end of 1950.

its goals for enlarging collectivized livestock. The comparison follows (in million head as of June):[30]

Type	Actual 1932	Goal for 1937
Cattle	8.8	9.2
Hogs	3.2	9.6
Sheep and goats	12.1	27.6

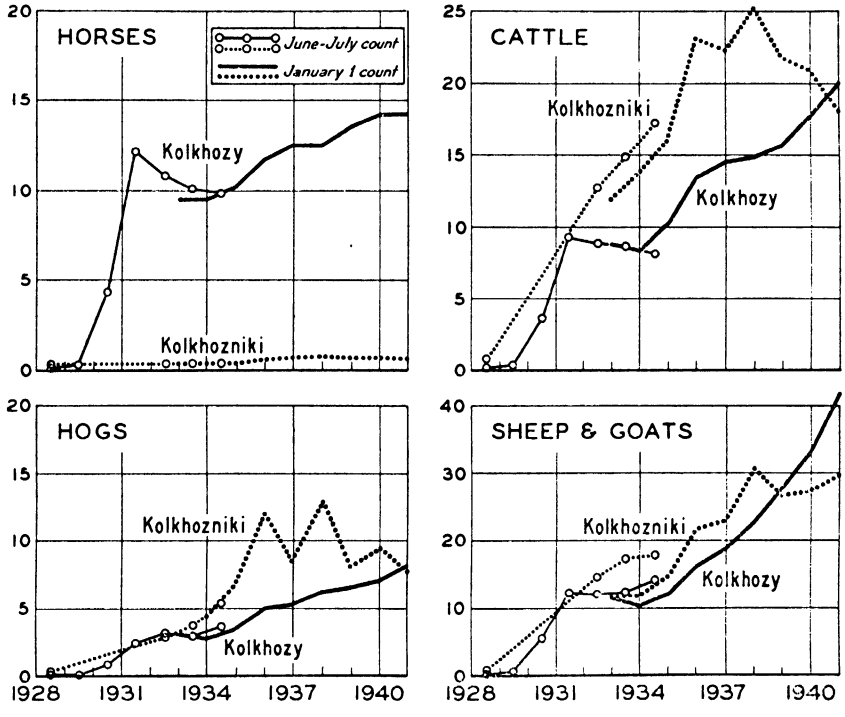
But the pressure was applied as soon as the worst of the early 'thirties began to fade. Although the 2d Plan goals for the expansion of total and kolkhoznik livestock were missed by huge margins, and the kolkhoz herds did not begin to expand until the middle of the 2d Plan Period, the goals for collectivization were

[30] The goal for 1937 was for the herds in kolkhoz commercial livestock fermy only, but according to *2d Plan*, I, 237, all collectivized livestock should have been in such fermy by 1937.

exceeded as to cattle, about fulfilled as to sheep and goats, and only moderately missed as to hogs.

The period of temporary retreat in the collectivization of livestock definitely ended in 1938. The policy of providing for increases in both collectivized and kolkhoznik livestock, with greater emphasis on the latter, was superseded by that of increasing collectivized herds and reducing kolkhoznik holdings. Some

CHART 23.—LIVESTOCK OF THE KOLKHOZY AND KOLKHOZNIKI, 1928–41*
(*Million head*)



* Data in Chart Appendix. June-July counts, 1928–34; Jan. 1 counts, 1933–41.

of the drastic measures taken to attain this end have been mentioned. The principal one—the obligatory minimum of commercial fermy and of the herds in these—will be discussed below (pp. 356–57). Their cumulative effect was that until the war started every type of kolkhoz livestock kept increasing year after year. The normally strong effect of the harvest on the herds can be observed, in the case of the kolkhoz livestock, only in a speed-up or slowdown in the rate of increase. The effects of the

variations in crops on the herds were transferred almost entirely to the holdings of the kolkhozniki. The changes in kolkhoz livestock reflected almost exclusively the ability of the government to force the kolkhozy and kolkhozniki to the actions desired.

As a consequence of the persistence in raising the collectivized livestock by all means even during the war, collectivized cattle and sheep in the unoccupied territory continued to increase while an otherwise inevitable great decline in collectivized hogs was prevented. The following data are available for the collectivized herds in a comparable territory (in million head):[31]

Type	Jan. 1 1941	Jan. 1 1943
Cattle	11.5	12.9
Hogs	3.2	3.2
Sheep and goats	26.1	32.4

A considerable decline in collectivized horses could not be avoided; hence no data were released.

Continuance of the policy of expanding the kolkhoz herds at the expense of the kolkhoznik holdings is planned for the 4th Period, as shown by the following data (in million head):[32]

Type	Actual 1938	Actual 1941	Goal for 1951
Horses	12.5	14.4	10.3
Cattle	14.8	20.0	25.9
Hogs	6.3	8.2	11.0
Sheep and goats	22.7	41.9	68.1

Thus the collectivized cattle and hogs in 1951 are scheduled to number about 75 percent more than in 1938, while the goal for the collectivized sheep and goats calls for a trebling of the 1938 herds. According to Demidov, the proportion of collectivized sheep and goats in the total owned by kolkhozy and kolkhozniki

[31] *Bolshevik 1942*, No. 17–18, and *Izvestiya*, May 13, 1943.

[32] The figures for 1951 are obtained by adding the figures given for the individual republics in the *4th Plan*. No figures are given in the source for collectivized livestock in the Baltic States and Moldavia, apparently because the plans for collectivizing the added territories were not to be disclosed. There is no way of finding out whether goals for collectivized livestock in the RSFSR, Ukraine, and White Russia include the goals for the old territories only, or whether the livestock in the kolkhozy which are expected to exist in the added territories at the end of 1950 are included as well. The figures for 1938 and 1941 are for the old territory (see Table 65, p. 764).

must increase from 46 percent in 1940 to 56 percent in 1950.[33]

Commercial kolkhoz livestock fermy.[34]—The government order of February 13, 1930, "On Measures for Developing the Animal Husbandry," prescribed the organization of specialized large livestock kolkhozy (beef, milk, sheep, hogs, or poultry).[35] These not only were to be similar to the large state livestock farms, but the order made no distinction between large livestock kolkhozy and sovkhozy. Paralleling similar organizations for the livestock sovkhozy, the Kolkhoz Dairy Center and the Kolkhoz Hog Center were organized by a decision of the VIth Congress of Soviets of March 17, 1931 to guide the corresponding kolkhozy.[36] In addition to the specialized large livestock kolkhozy, the order of February 13, 1930 had called for the "organization of a mighty commercial animal husbandry in large field-crop kolkhozy."

Both specialized kolkhozy and their centers soon disappeared. The specialized livestock kolkhozy became general kolkhozy, with their animal husbandry assigned to fermy within the kolkhozy. The failure to organize large field-crop kolkhozy prevented the organization of the fermy that were to be attached to them.

As the commercial kolkhoz livestock fermy have finally developed, they are livestock enterprises within each kolkhoz, each typically having a manager and separate personnel. Each ferma normally has only one kind of livestock; indeed, in the beginning they wanted the dairy fermy separated from the fermy raising calves and from the fermy finishing cattle for slaughter. But some of the fermy have more than one kind of livestock.

The specialized dairy, hog, and other livestock kolkhozy and the livestock fermy organized within the kolkhozy were relatively large from the very start. Some dairy kolkhozy or kol-

[33] S. F. Demidov, *Development of Agriculture in the Postwar Five-Year Period* (Moscow, 1946), p. 141. The percentages given by Demidov are of particular interest because, in their computation, the scheduled but undisclosed amount of collectivization in the new territories was probably taken into account.

[34] The Russian term ferma (plural "fermy") is retained because, though of the same origin as the English word "farm," its meaning is somewhat different.

[35] *Most Important Decisions on Agriculture* (2d ed.), p. 335.

[36] *Ibid.*, p. 425.

khoz dairy fermy in West Siberia and Ukraine had more than one thousand head of cattle.[37] Yet the 1932 plan for the development of livestock fermy in kolkhozy called for further large increases in size. By January 1, 1933, the average in dairy fermy was to be 123 cows, in hog fermy 60 sows, in sheep fermy 1,380 sheep, and so on.[38] On January 1, 1937, the cattle fermy actually averaged about 35 cows, the hog fermy perhaps 10 sows, and the sheep fermy 216 sheep.[39]

The decision of the VIth Congress of Soviets of March 17, 1931, which first mentioned the commercial kolkhoz livestock fermy, contained nothing about their organization. Little on this matter appeared in the order of the government and Party of July 30, 1931, which prescribed a rapid increase in the number of fermy. In that advanced stage of the collectivization drive the forms of organization were even less matured for collectivized livestock than for collectivized crop production.

Although the idea of large specialized livestock kolkhozy and of commercial kolkhoz fermy was born at a time when the Party and government were desperately searching for suitable organizational forms to bring order out of chaos, the reasons for establishing those organizations were not so much organizational as distributional. The mere collectivization of a considerable proportion of the existing peasant livestock was not enough. The Soviet leaders were looking for a form of kolkhoz livestock enterprise that would be disconnected from the requirements of the collective members. In the decision of the government and Party of July 30, 1931, "On the Expansion of the Socialist Livestock Industry," it is stated:

. . . . in the commercial kolkhoz fermy and breeding stations is found a form of socialized livestock and poultry industry which is most suitable for the present artel stage of kolkhoz economy and which, along with the sovkhozy, most rapidly solves the problem of the organization of a large-scale commercial livestock industry. The marketable portion is high in this form —up to 70 percent in the case of milk and butter, instead of 10 to 20 percent for the individual farm and 10 to 30 percent for the common collectivized livestock . . . . the commercial kolkhoz fermy undoubtedly will become in

[37] M. Kravchenko, "The Immediate Problems of the Livestock Commercial Fermy," *Socialist Reconstruction of Agriculture*, February 1932, p. 46.

[38] *Ibid.*, p. 43.

[39] Stated or implied in data in *Kolkhozy in the 2d Stalin Five-Year Period*, p. 101.

the future the most important producers of marketed livestock products for the government.[40]

The regulations evidently aimed to eliminate any distribution of the output of the fermy among the kolkhozniki, an aim that was practically achieved. In 1937 the dairy kolkhoz commercial fermy, for example, used 19 percent of their milk for feeding calves and sold 73.3 percent—a total of 92.3 percent. The milk sold included that processed into butter, of which 75 percent was sold.[41] Part of the balance was used by the kolkhozy for feeding workers, in children's nurseries, and the like. Virtually no milk was distributed to the kolkhozniki.

Originally the commercial fermy were sponsored along with the development of the common collectivized livestock. But on July 1, 1934, the Party decided: "In the belief that the commercial kolkhoz ferma is the best form of organization of kolkhoz livestock, all collectivized livestock is to be transferred into commercial fermy during 1934."[42] While the speed demanded by the Party turned out unenforceable, practically all collectivized productive livestock was concentrated in such fermy in a short time. On January 1, 1939, all collectivized hogs and sheep and goats, and 12.9 million out of a total of 13.5 million collectivized cattle, were in commercial fermy.[43]

The rapid increase in the number of kolkhoz fermy by the end of 1938, when they were given another strong boost, is indicated by the following figures for the beginning of the years shown (in thousands):[44]

Type	1932	1939
Dairy	39.3	147.4
Hog	20.8	86.7
Sheep and goats	2.0	91.1
Horses	1.5	31.1
Mixed	....	50.0
Total	63.6	406.3

[40] *Most Important Decisions on Agriculture* (2d ed.), p. 341.

[41] A. Stupov, "Development of the Collectivized Livestock in Kolkhozy," *Problems of Economics*, May 1939, p. 98.

[42] *Most Important Decisions on Agriculture* (2d ed.), p. 371.

[43] Data from *Socialist Agriculture USSR, 1938*, p. 75, and from the order of the government and Party of July 8, 1939, "On Measures for Development of the Collectivized Livestock of the Kolkhozy," *Most Important Decisions on Agriculture of 1938–40* (Moscow, 1940), pp. 346–62.

[44] *Socialist Agriculture USSR, 1938*, p. 75.

As many as 92 percent of all kolkhozy had one or more fermy at the beginning of 1939.

The kolkhozy, and especially the kolkhozniki, naturally had no real interest in the expansion of the collectivized livestock, since they had no share in the product but almost valueless money, and the collectivized herds had priority for roughage over the kolkhoznik stock. Hence, around 1938, when nearly all collectivized livestock was in commercial fermy, the time was ripe for a further step.

The order of July 8, 1939[45] considered it desirable for each kolkhoz to have three livestock fermy, for cattle, sheep, and hogs. Two fermy were made obligatory, a cattle ferma and a hog or sheep ferma. Accordingly the number of fermy jumped from 418,800 in July 1939 to 605,500 on January 1, 1940, subdivided as follows:

Cattle	233,400
Hogs	145,500
Sheep and goats	191,000
Horses	35,600

In addition there were 30,700 poultry fermy on January 1, 1940 and a further 86,000 poultry fermy were organized in the following six months.

The most important provisions of the order of July 8, 1939, however, were the regulations as to the minimum number of animals in each ferma, i.e., actually in the kolkhoz. The livestock numbers in each ferma were made dependent upon the total land of its kolkhoz and varied also with the region. In the Ukraine, for example, the obligatory minimum numbers of cows and sows per cattle and hog ferma were as follows:

Size of kolkhozy (hectares)	Number of cows	Number of sows
Not over 200	10	6
200–500	20	10
500–1,000	40	18
1,000–2,000	60	26
2,000–3,000	80	34
Over 3,000	100	

This livestock density was to be attained not later than the

[45] *Most Important Decisions on Agriculture of 1938–40*, pp. 346–62.

end of 1942, and by the end of 1940 at least 60 percent was to be reached.[46]

A computation for the Ukraine shows that the prescribed density of the collectivized livestock was very large. There were 27,393 kolkhozy in the Ukraine on July 1, 1938. Most of them probably belonged to the two groups with 500–1,000 hectares and 1,000–2,000 hectares. Provided every kolkhoz were to have one cattle and one hog ferma[47] the prescribed minimum for all of them would be over 1,000,000 cows and around 500,000 breeding sows. On January 1, 1938 the collectivized farms of the Ukraine had only 369,000 cows and perhaps 300,000 sows.[48] Thus the collectivized livestock of the Ukraine was to be approximately doubled in the less than 3½ years that remained from the date of the order to the end of 1942.

A large element of unfairness in the order, although minor as compared with the unfairness of its principal issue and the whole collective system, was that the kolkhozy with 550 and 950 hectares were supposed to have the same number of livestock in their fermy. Large kolkhozy were favored also in that the livestock numbers prescribed for the several groups did not increase proportionately with the size of the farms.

The livestock of the kolkhozniki were to be a major source of the expansion of the kolkhoz herds in compliance with the new order. As we have seen (p. 347), large numbers of livestock were purchased by the kolkhozy from the kolkhozniki in 1939 and 1940.

Chart 23 (p. 351) clearly reflects the effect of the order of July 8, 1939. From January 1, 1939 to January 1, 1941 collectivized cattle, hogs, and sheep and goats increased by 28.2, 24.2, and 47.2 percent respectively. While these rates of increase were certainly substantial—vis-à-vis the decline in the total number of cattle and hogs—they were greatly below those expected as the result of so drastic an order. The evidence on

[46] The idea that a kolkhoz which had 60 percent of the prescribed cattle quota in 1940 could raise it to 100 percent by 1942, i.e., in two years, is one among many at which the informed reader can only marvel.

[47] Sheep are unimportant in the Ukraine.

[48] The figure for cows is official. The Ukrainian kolkhozy would have had around 275,000 sows, if the proportion of sows in their herds were the same as for all Ukrainian hogs.

the increase in total collectivized livestock in the first two years of the war, and the expected further expansion in postwar years as scheduled by the 4th Plan (see above, pp. 352–53), pertain wholly to the herds of the fermy since these represent all collectivized stock.

OPERATIONS

Kolkhozy.—According to official computations, gross agricultural production of the kolkhozy was as follows:[49]

	Million 1926-27 rubles		
	1929	1932	1937
Total	480	6,677	12,669
Vegetable production	435	6,037	11,445
Grain	133	2,365	5,653
Technical crops	34	807	1,622
Animal production	45	639	1,223

	Percent of total USSR production		
	1929	1932	1937
Total	3.3	51.1	63.0
Vegetable production	4.8	61.7	75.9
Grain	4.0	68.3	89.0
Technical crops	3.9	74.0	92.9
Animal production	.8	19.4	24.2

The absolute figures for 1932 and 1937 have limited value owing to overestimations (see chapter xxviii). Even the percentages need certain adjustments to be used as indicators of the share of kolkhozy in total gross production. Since the livestock of the kolkhozniki is in part fed feed obtained by them from their kolkhozy in payment for their work, part of the gross production classed as that of the kolkhozniki is actually kolkhoz output, and the latter may be taken as about 65 percent of the total in 1937. With the share of the kolkhozy as large as this, the discussion in Part IV of the developments of all agriculture in the last prewar years and later applies largely to the kolkhozy. A detailed analysis of the kolkhoz activities would thus be to a considerable extent repetitive.

As shown by the data in the tabulation above, the share of the kolkhozy in the total output varies considerably with the product. They produced 89 percent of all grain (by value) in

[49] *Socialist Construction USSR, 1936*, Gosplan (Moscow, 1936), pp. 236–37, and *Socialist Agriculture USSR, 1938*, pp. 86 and 88.

1937. Everything said in chapter xxii and Appendix Notes H, I, and J on grain applies therefore to the kolkhoz production, with such minor modifications as the fact that kolkhoz fields perhaps averaged 0.1 quintal per hectare less than the country average and the acreage of grain crops that need much labor, such as millet, was larger in kolkhozy than in sovkhozy. The kolkhozy produced an even greater proportion of the technical crops than of grain, so the discussion in chapter xxiii covers the kolkhoz activities adequately. As to roughage, the kolkhozy produced more than 75 percent of the total.

The share of the kolkhozy was relatively moderate only in potatoes and vegetables (45 and 44.6 percent respectively of the total acreages in 1938), and possibly in fruits. But the evidence on the production of all crops by type of owner in the last prewar years is so limited that no attempt at analysis is justified.

The discussion in chapters xxii through xxiv demonstrates that cotton was the only crop that showed a large increase in yields over the collectivization period. Moreover, neither this increase nor the fair improvement in the yield of sugar beets came as the result of collectivization. With the greatly enlarged applications of commercial fertilizer the same or even higher yields would have been obtained by individual producers. The increase in the average yield of grain and flax by a few percent in a decade would most probably have been outdone had agriculture remained in private hands. And certainly the declines in the yields of sunflower seed, hemp, hay, and some other crops would not have occurred.

The kolkhozy produced only 24 percent of all animal products in 1937. The value of this production from the viewpoint of the state lay in the fact that most of the goods produced were marketed. By 1940 the share of the kolkhozy in the output of animal products was raised to possibly 35 percent of the total.

The kolkhoz animal husbandry, like that of the sovkhozy, showed improvements during the 'thirties. While the kolkhoz enterprises were never in such bad shape as those of the sovkhozy they too had great shortcomings and their attainments fell far short of the goals. Not until 1938, for example, did the kolkhoz commercial fermy reach a reasonable relation between the cows

available at the beginning of the year and the number of calves born during the year (93 calves per 100 cows in 1938 as against 74 in 1932). The average yield of milk per cow in the kolkhozy amounted to 1,027 kilograms in 1937[50] as against the goal of 1,500 kilograms in the 2d Plan for 1937. Their milk yield was measurably short of the country average; it was below that obtained by the individual sector in the same year, and negligibly exceeded the pre-collectivization level. The kolkhozy possibly had a larger annual output of pork per sow than the individual sector because they were able to feed concentrates more heavily.

All in all, the kolkhozy unquestionably failed to reach the efficiency level of the better pre-collectivization peasants in animal husbandry as in everything else. They were possibly also below the level the entire private sector would have reached had it been permitted to operate unhampered.

Kolkhozniki.—The share of the kolkhozniki in the gross agricultural production was estimated for 1937 at 21.5 percent of the USSR total and at 25.5 percent of the total of kolkhozy and kolkhozniki combined (Table 1, p. 47). In 1932 the share of the kolkhozniki in the combined output had been only 22 percent. Hence from 1932 to 1937 the operations of the kolkhozniki expanded at a somewhat more rapid rate than those of the kolkhozy. This upward trend was then arrested and reversed —for animal production in 1938, when the new policy toward the livestock of the kolkhozniki was inaugurated, and for crops in 1939, after the kolkhozniki had lost a substantial part of their vegetable gardens in accordance with the order "On Measures toward Safeguarding the Collectivized Land from Being Squandered."

The kolkhozniki are supposed to use their tiny lots for potatoes, vegetables, and fruits. But part of the land alloted to them is unadapted to this purpose, and the peasants do not always have sufficient man power to plant all suitable land allotted to them to crops requiring large labor inputs. Of the 8.5 million hectares held by the kolkhozniki in 1938, they used 5.3 million as cropped plowland (Table 2, p. 48). More than one-

[50] *Socialist Agriculture USSR, 1938*, p. 78.

fifth of this acreage was in grain, of which only 391,400 hectares were in corn, the grain best adapted for growing as a garden crop.[51] The kolkhozniki had in that year 238,700 hectares in rye, 192,600 hectares in barley, and the rest in other grains—all of them typical field crops.

The rather substantial area of 335,000 hectares of feed crops, of which 185,800 hectares were feed roots, was grown by the kolkhozniki in 1938. In view of the great shortage of feed perennially faced by the kolkhozniki, one wonders why they raised so little of these crops. Shortages of labor and possibly also of suitable land were probably the main reasons.

Potatoes and vegetables are the only hoe crops in the production of which the kolkhozniki played a large role. In 1938 they had 40 percent of the total potato acreage, only about 10 percent less than the kolkhozy.[52] Their share in the total acreage of vegetables was 33 percent.

The 129,800 hectares the kolkhozniki had in fibers (mostly hemp, the rest flax) are worthy of mention. Their area of 46,800 hectares in sunflower, however, seems rather small for this crop, well adapted to be grown in the garden. The high delivery quotas for sunflower seed proved a handicap even for the sowings of the peasants.

Of the 3.2 million hectares of kolkhoznik garden land not used as cropped plowland, not much less than 600,000 hectares are supposed to have been in fruits and berries in 1940.[53] This was close to 40 percent of all such acreage. Around 2.5 million hectares of the kolkhoznik land were used as pasture or not used at all. The figures here analyzed are totals for the country. The garden allowances of the kolkhozniki are smaller in the very areas where they are most likely to have a relatively large acreage in intensive crops. No other person, even a member of the same kolkhoz, is permitted to use one's allotment; this prohibition may partially account for the fact that a large part of the kolkhozniki's land was not used intensively.

[51] Sweet corn, however, is apparently not grown by the kolkhozniki; it is mentioned only in connection with canning.

[52] The sovkhozy had only a small share in the remainder, the bulk of which was grown by individual peasants and the non-farming population.

[53] Demidov (*op. cit.*, p. 72) gave the acreage in fruits and berries of the kolkhozniki, workers, and employees (probably also individual peasants) at 600,000 hectares.

The acreage taken away from the kolkhozniki in accordance with the order of May 27, 1939 "On Measures toward Safeguarding the Collectivized Land from Being Squandered" may have been considerably smaller than that used by them only as pasture or not used at all. But nobody who did not intend to use the land intensively would have bothered to get illegal possession of additional land, with all the risks connected with such action. The land taken away from the kolkhozniki must have come largely from the 5.3 million hectares they had used as cropped plowland, and it certainly constituted a substantial part of the latter. The writer has found no data on the cropped plowland of the kolkhozniki since 1939, in spite of persistent search. There is an obvious effort to avoid the subject, even with reference to individual crops of the kolkhozniki. The decline of the potato area from 7,305,000 hectares in 1938 to 6,354,700 in 1940[54] was almost certainly, at least to a large extent, at the kolkhozniki's expense. While the acreage in vegetables of Type 1 (see p. 595) increased during the war, that of the kolkhozniki apparently declined.

Somewhat more than one-half of the 1937 gross production of the kolkhozniki was made up of animal products. While this output was small compared with the requirements of the huge kolkhoz population, it is still amazing that the peasants succeeded in feeding so many animals. The distributions of feed by the kolkhozy could have covered only part of their requirements. The production of feed by the kolkhozniki themselves was small in relation to the herds. In the calculations in Appendix Note H, 3 million tons of grain were allowed for theft, most of it by the kolkhozniki from their own kolkhozy. That figure did not include theft of seed. Part of the stolen grain was feed grain. All other products of the kolkhozy, including roughage, are likewise regularly stolen by the members.[55] They certainly and rightfully do not consider this action theft.

[54] E. Vintaikin, "Location of Potato Growing in USSR," *Socialist Agriculture*, December 1947, p. 28.

[55] An allowance for this theft is made in chapter xxix in calculating kolkhoznik incomes.

CHAPTER XVI

OBLIGATORY DELIVERIES AND KOLKHOZ MARKETS

THE FIRST COMMANDMENT

Since 1931 the claim of the state for its dues from the kolkhozy has been termed the "first commandment." "Sacred obligation" is another favorite term for the deliveries by the kolkhozy, kolkhozniki, and individual peasants to the state. Since a somewhat later date the term "second commandment" has been applied to the obligation to store seed grain. This resort of the atheistic Communists to religious terms is worthy of note.

There is a fundamental difference between the commandments to the kolkhozy and the Biblical commandments. All of the latter have equal force; those to the kolkhozy imply a ranking. The first commandment to the kolkhozy has a priority over the second, the second over other dispositions of kolkhoz products.

If the deliveries of the kolkhozy to the state were real surpluses and were bought at fair prices, it would be immaterial who received his share first. But the term surpluses used in connection with obligatory deliveries was a misnomer, and was soon dropped entirely. The state determines its due without adequate consideration of the needs of the producers. Furthermore, the prices paid for the deliveries were allowed to deteriorate to such an extent that orders dealing with the deliveries sometimes neglected to mention that prices were involved at all.

It thus became vitally important for the state to get its share from the first proceeds, before the kolkhozniki are assured their minimum requirements, or even the kolkhozy's needs are covered, and without regard for the fact that this arrangement interferes with the timely gathering of the harvest and therefore affects the very size of the harvest.

The 1930 Artel Charter was not quite definite as to the priority rights of the state in the kolkhoz production. Party and government pronouncements took care of that. A formula in which all *i*'s were dotted is found in the decision of the government and Party of August 2, 1933:

> After the kolkhozy have fulfilled their annual grain-delivery quotas to the government, paid to the MTS the grain due it, and returned seed loans, the kolkhozy start accumulating the seed fund, the seed insurance fund to the extent of 10 to 15 percent of the seed requirements, and the feed fund to the extent of the yearly requirement of the collectivized livestock. The remainder is then distributed in full to the kolkhoz members in proportion to the trudodni.[1]

Thus priorities were accorded to everything but the requirements of the kolkhozniki. These definitely come last.

The formula of the decision of August 2, 1933 was almost literally embodied in the Model Charter of 1935 (Article 11). The kolkhoz chairmen and members of the kolkhoz board who do not obey these regulations are guilty of a serious crime.

All delivery regulations have definite time schedules. The deliveries must proceed simultaneously with the harvest—directly from the combine or thresher. In 1933, for example, when the shortage of draft power was at its worst, the kolkhozy of the Crimea had to deliver 30 percent of their yearly grain quota in July, 40 percent in August, 25 percent in September, and 5 percent in October.[2]

To insure that kolkhoz members harvest "their own" crops, it became necessary to provide that certain quantities of the harvested produce be distributed to the kolkhozniki on their trudodni before all obligations to the state are fulfilled. But those quantities were small from the start and some were reduced as time passed. According to an order of August 1, 1940, for example, quantities equal to 15 percent of the grain and 5 percent of the sunflower seed and rice *actually delivered to the state* could be used for the needs of the kolkhozy, including

[1] *Most Important Decisions on Agriculture*, State Publishing Office of Kolkhoz and Sovkhoz Literature (2d ed., Moscow, 1935), p. 446. On trudodni, see pp. 403–05.

[2] Order of the government and Party of January 19, 1933. See *Most Important Decisions on Agriculture* (2d ed.), p. 557.

distribution to the kolkhozniki participating in the harvest.[3] The same order reduced the "advance" distribution of potatoes on trudodni to 10 percent of the harvest from the 10–15 percent established by the order of May 19, 1938. First distribution was to go to those who participated in the potato harvest.

That the kolkhozy are deprived of the right to dispose freely of their produce is obvious from the fact that the orders dealing with the disposition of kolkhoz produce usually contain a special regulation, here reproduced from the order of the government and Party "On Obligatory Deliveries of Grain and Rice to the State by the Kolkhozy and Individual Peasants," dated April 11, 1940:

> The local governments and procurement agencies are positively forbidden to impose upon the kolkhozy and individual peasants obligations for delivery of grain and rice in excess of those prescribed in this order.
>
> The whole balance of grain, after the obligations for delivery of grain and rice to the government are fulfilled, remains at the full disposal of the kolkhozy, kolkhoz members, and individual peasants.[4]

If there were no other evidence, the very fact of the annual repetition of the prohibition is sufficient proof that it is regularly violated.

Moreover, the prohibition of demands for additional deliveries applies only to local authorities. After the obligatory deliveries to the state are fulfilled, the kolkhozy, kolkhozniki, and individual peasants are urged to sell grain and some other products to the state at somewhat higher prices, with certain privileges with reference to purchases of industrial goods. About 3.9, 3.4, and 2.8 million tons of grain were purchased by the state in this way in 1937, 1938, and 1939 (see Table 60, p. 738. Pressures for such voluntary sales, before the needs of the kolkhozniki have been satisfied, are at their seasonal peak in November-December. Headlines such as the following,

[3] *Most Important Decisions on Agriculture of 1938–40*, p. 109. In former years the 5 percent of sunflower seed had to go entirely to the kolkhozniki. How important those 5 percent—not of the whole crop but of the quantities delivered to the state—were deemed to be is evident from the order of the government and Party of Mar. 6, 1935, which read: "To preserve with reference to sunflower seed the existing five percent of the quantities delivered to procurement points for distribution among the kolkhozniki on trudodni, prohibiting the utilization of those quantities for any other uses." Yet shortly afterward the restriction against using that allowance for other purposes was removed.

[4] *Most Important Decisions on Agriculture of 1938–40*, p. 387.

appearing at that season, "Let us give as much grain as possible in excess of plan,"[5] are orders in the USSR. The sales of meat to the state or co-operatives above the plan, are proportionately much higher than those of grain. A parallel to such voluntary sales are the so-called decentralized procurements by co-operative and other organizations, which, however, are permitted only for non-grain products.[6]

Shepilov aptly stated: ". . . . the regulation by which the kolkhozniki receive their share only after the state has got its due, and after all seed, feed, and insurance funds have been provided for, ... insures the stability needed by the artel economy, protects it from all accidents, and guarantees the strengthening and development of the socialistic property."[7] The only stability not insured by this provision is that of providing the kolkhozniki with food. The first commandment, indeed, represents a complete reversal of the situation encountered throughout the non-Soviet world. The instability from the point of view of the kolkhozniki is indeed twofold: all-round inadequacy and violent year-to-year variations.

DELIVERY TECHNIQUES IN GENERAL[8]

The techniques of taking over the kolkhoz produce by the government were changed four times for the most important products during the collectivization period. Compulsion was common to all of the new forms. Certain of these changes also involved the kolkhozniki and individual peasants.

Kolkhozy.—The earliest system, the kontraktatsiya, was developed before the collectivization drive, but was greatly expanded in the beginning of the drive and was rapidly losing the few traces of voluntariness that it had before. The contracts stipulated certain acreages and yields. For most individual crops the contracts called for delivery of the total output; for these the stipulated acreage was the most important portion of

[5] *Socialist Agriculture*, Nov. 29, 1946.

[6] For details see L. E. Hubbard, *Soviet Trade and Distribution* (London, 1938), pp. 168–74.

[7] D. Shepilov, *Socialist Kolkhoz Property* (Moscow, 1940), pp. 120–21.

[8] M. Moiseev, "The Progressive Nature of the Per-Hectare Assessment of Obligatory Deliveries," *Socialist Agriculture*, July 7, 1947, pp. 3–16.

the contract. Of other crops the contracts called for delivery of certain quantities per hectare, and the total quantity to be delivered was the essence of the contract.

Moscow decided how much grain or other produce it needed and these requirements were then distributed for kontraktatsiya among the several republics. The quantities or acreages assessed to the republics were then divided among the oblasti. So the ball rolled until everyone concerned had been notified of the definite amounts to be inserted in the contracts, or the definite acreages upon which the delivery contracts were to be based. A further disadvantage of this system was that the quantities or acreages which one had to "sell on contract" were rather arbitrarily assessed on more or less indefinite principles (see Appendix Note D).

Since 1932, the kontraktatsiya has gradually been replaced by "definite obligations to deliver." The start was made with meat and milk, but grain (including dry legumes), potatoes, sunflower seed, and wool followed soon. Vegetables, hay, and most oilseeds other than sunflower seed were added in 1940. Linseed and hempseed followed in 1941. The kontraktatsiya has remained in force only for cotton, sugar beets, and certain other crops, mostly of minor importance.

The qualification of the term "obligation" with "definite" emphasized that the deliveries were to be made whether or not the goods were produced in quantities permitting such deliveries. Crop failures, epidemics, and the like were not supposed to affect them. All government measures dealing with the definite obligatory deliveries emphasized that the deliveries have "the nature of a tax" and heavy penalties were prescribed for non-fulfillment.

An important change was made in the basis of assessment of obligatory deliveries from the kolkhozy at the end of the 'thirties. At first, they were assessed on the basis of acreage planted, or supposed to be planted according to plan, to a certain crop or group of crops; correspondingly, the basis for delivery of animal products was the number of animals present, or supposed to be present according to plan, on the farm at a given date. This system was replaced in 1940 (for milk and eggs in

1941) by the assessment of obligatory deliveries according to land in the possession of the kolkhozy, as follows:[9]

Product to be delivered	Type of land
Grains, oilseeds; potatoes and vegetables; certain other crops; eggs	Arable land
Hay	Arable land and meadows
Animal products other than eggs	Total land usable for agriculture

The difference in the composition and quality of the land in the same areas was ignored in assessing the deliveries under the new regulations, and only rough allowances were made even for differences in land from region to region.

The purpose of the shift from the kontraktatsiya to the "definite obligations" was to eliminate the uncertainties in assessment. The change to assessment on the basis of acreage was for the purpose of enforcing a greater intensity of production per unit of area or per animal. Much was heard of a kind of guaranty to progressive kolkhozy to the effect that they would not have to deliver more if they produced more. The resolution of the Party of February 1947 stated in this connection:

> The system of assessing obligatory deliveries on the basis of cropped plowland and livestock herds which existed before 1940 was killing the interest of the kolkhozy in the development of socialized kolkhoz economy . . . .
>
> The new principle, based on such a stable basis as the land assigned to the kolkhozy by the State by acts for eternal utilization, has abolished that inadequacy . . . .
>
> Only the enemies of the kolkhoz system . . . . can drag the Party back to the abandoned . . . . policy of deliveries based on cropped plowland.

Despite such lengthy reasoning, here quoted only in part, the indefiniteness condemned in the old system was restored by the same decision. The Council of Ministers was empowered to reduce the rates to be delivered per hectare of land for the kolkhozy producing little and to increase the rates for those producing much. Thus the guaranty that nothing could be demanded in excess of the rates valid for other kolkhozy was revoked. Al-

[9] The general order announcing the change in the basis of procurements was dated Apr. 7, 1940. This order extended to all other agricultural products the regulations that had been prescribed for meat by the order of Sept. 17, 1939, and for wool by the order of Jan. 30, 1940. The special orders were dated as follows: grain and rice, Apr. 11, 1940; potatoes, Apr. 16, 1940; hides, Apr. 20 and June 23, 1940; vegetables, May 9, 1940; oilseeds, May 17, 1940; hay, May 27, 1940; milk, Jan. 8, 1941.

though the basic principle of the system, proclaimed as highly effective, was abandoned, the language reads as if it had remained in force.

Like the assessments per hectare in crops or per animal, the assessment per hectare of land in possession of the kolkhozy is entirely unaffected by crop hazards or variations in the output of animal products brought about by crop failures or epidemics.

Whatever the system of assessment, the kolkhozy served by the MTS are treated more leniently than those not served. For example, by the decision of the Party of February 1947 the obligatory deliveries of grain are 25 percent higher for the kolkhozy not served. This policy was introduced not only for the sake of the profits the government probably makes on the operations of the MTS. The serving of the kolkhozy by the MTS is believed desirable on political grounds.

There are important differences between foodstuffs and feedstuffs, on the one hand, and non-edible products, including sugar beets, on the other, in the proportions of total production to be delivered and in the prices paid for the deliveries. With reference to foodstuffs and feedstuffs, the policy is to take over part of the output at prices which were low at the start and which were little changed later in the face of a rapidly growing inflation. Ultimately the prices paid for the deliveries became nominal, or nearly so. It is shown below that the proportion of the grain and potato crops taken over at such negligible prices is quite substantial. More than one-quarter of the sunflower-seed crop and about 30 percent of the meat production are procured on this basis.[10]

The delivery regulations aim at obtaining the total output of cotton, sugar beets, and certain other technical crops, and of hides, skins, and to a large extent, wool. This precludes confiscation with practically no pay, which is the way many food-

[10] In appraising the burden imposed by the delivery quotas for the various crops, one must consider that a large portion of the output is used by the kolkhozy for production purposes, such as payment to the government for the services of the MTS, and for seed and feed—specifically for feeding the livestock of the commercial fermy, in the physical product of which the kolkhozniki have little or no share. Indeed, the obligatory deliveries of grain, potatoes, and some other crops can be correctly related only to that part of the crop which enters into the value available for sale and for use in the farm home, i.e., the obligatory deliveries plus distribution to the kolkhozniki.

stuffs are procured. But no important farm product is paid for at a fair price. To assure continued production of certain technical crops, the producers receive means of production, and occasionally consumers' goods as well, at relatively low prices.

Kolkhozniki and individual peasants.—The small individual enterprises of the kolkhozniki and, of course, those of the individual peasants were also subject to kontraktatsiya and later to obligatory deliveries. Their delivery obligations were mostly fashioned in the same way as those of the kolkhozy before the method of assessment for the latter was changed in 1940 and 1941, and have since been retained in the old form. Delivery rates of the kolkhozniki were mostly lower than those of the kolkhozy, but occasionally were higher. Individual peasants as usual are discriminated against. The most important peculiarity of the delivery system affecting the kolkhozniki and individual peasants is that they are obliged to deliver meat and potatoes whether or not they possess any livestock or grow any potatoes.

The instruction of the Commissar of Food Industries "On the Execution of the Obligatory Deliveries of Meat in 1935," dated September 9, 1935,[11] first emphasized in Article 8 that the delivery obligations of the kolkhozniki and individual peasants apply "regardless of their economic situation and of the possession of livestock and poultry." In the special section on "Responsibility for Non-fulfillment of Obligations" (Articles 36 and 37) the instruction prescribed that "All households which have not fulfilled their quarter-year norm by the end of the quarter are required by the village soviet, by way of penalty, to pay the market value of the undelivered portion of the quarter-year norm." In addition, the undelivered portion is exacted in livestock from those households that have any. With reference to households without livestock, the order prescribed:

> In the case of absence of livestock or poultry in a household which did not fulfill its obligation in due time, simultaneously with collecting the penalty [equal to the value of the undelivered portion of the quarter-year plan at market prices], a new date is set for this household in the next quarter of the year. In case of a repeated non-fulfillment of the obligation within the newly set date, the culprit is again penalized the market value of the non-delivered

[11] *Most Important Decisions on Agriculture* (2d ed.), pp. 626–33.

quantity of meat and is indicted before the court according to Article 61 of the criminal code of the RSFSR or corresponding regulations of the criminal codes of the other republics.

No private usurer would dream of getting his due twice and putting the debtor in jail as well.

Prices for deliveries.—A phenomenon that at first seems puzzling but is actually quite natural is the persistence with which the various regulations avoid stating the prices paid for obligatory deliveries. When such a statement is found, it commonly reads "at the existing prices." Even when there is a change, the usual formula is "with an increase of the existing price by so many rubles per quintal" or by a specified percentage. The order of the Central Committee of the Party and of the Soviet of Peoples' Commissars of April 7, 1940, prescribing the change of the delivery basis from acreages in specific crops to total acreages of the kolkhozy, and some other orders published afterwards, neglected to mention that any price was involved in the deliveries. Such sources as reference books for chairmen or bookkeepers of the kolkhozy or for the directors of the MTS, where one would expect to find the existing delivery prices, are searched in vain.[12] The Russian saying fits well: "In the house of the deceased one does not speak of corpses."

DELIVERY TECHNIQUES FOR SPECIFIED PRODUCTS

Grain.—The kontraktatsiya of grain was replaced by obligatory deliveries beginning with the 1933 crop.[13] The assessment was made per hectare of winter grains as planted and of spring grains as planned. The basic order gave one quota for all grain, but in a supplementary order dated January 28, 1933, this was split into quotas for the individual grains, with little substitution of one grain for another permitted. The permitted substitution always involved increased burden.

[12] In addition to the reference books, the writer looked for prices in the *Most Important Decisions on Agriculture* (1st and 2d eds., Moscow, 1933 and 1935); *Finance-Economic Reference Book for Kolkhozy* (Moscow, 1936); and *Most Important Decisions on Agriculture of 1938–40*. Delivery regulations occupy hundreds of pages in these publications, but there are no traces of prices.

[13] Decision of the government and Party of Jan. 19, 1933. See *Most Important Decisions on Agriculture* (2d ed.), pp. 555–59.

Typical uniform quantities to be delivered by the kolkhozy in surplus areas in 1933 compared as follows with normal yields (in quintals per hectare):

Region	Kolkhozy not served by MTS, 1933	Kolkhozy served by MTS, 1933	Yield, 1932–34 average[a]
Central Chernozem	3.0	2.6	7.6
North Caucasus	2.5	2.1	6.6
Ukraine	3.1	2.5	7.1

[a] Official figures reduced by 5, 24, and 17 percent for 1932, 1933, and 1934 respectively. See chapter xxii.

The obligatory deliveries for the kolkhozy not served by the MTS amounted to about 40 percent of the actual crops. They were roughly three-quarters of crops less seed, feed, and payments to the MTS.

Beginning with 1934, the assessment of the obligatory deliveries was per hectare as planned for both spring and fall sown grain.[14] The per-hectare rates established for kolkhoz deliveries from the 1933 crop were reduced in the following years, but only for some areas and by moderate amounts. The order on 1934 deliveries reduced the rates for kolkhozy of the Central Chernozem region, as shown in the tabulation above, to 2.7 and 2.2 quintals per hectare respectively. The order on 1935 deliveries cut the rates for the Ukraine to 2.4 and 2.3 quintals per hectare, and for part of the North Caucasus krai to 2.0 and 1.9 quintals.

Gradual improvement in yields was the principal factor which made the established delivery quotas less burdensome. The grain crop of the kolkhozy averaged 75.5 million tons in 1937–39, according to the computations of the writer, and 10 to 10.5 million tons were turned over as obligatory deliveries, or about 14 percent of the kolkhoz gross crop.[15] This was of course in addition to the payments in kind to the MTS, which in those years exceeded the total obligatory deliveries, and to the "voluntary" sales at somewhat higher prices.

The individual peasant had at first to deliver 5 to 10 percent more per hectare (planned for them) than the kolkhozy in their area; the kulaki and well-to-do households 50 percent more than

[14] *Most Important Decisions on Agriculture* (2d ed.), p. 590.

[15] See Table 60, p. 738.

other individual peasants.[16] The kolkhozniki, for whom the obligations were per hectare planted, had to deliver 5 percent less than the individual peasants but 5 percent more than the kolkhozy.[17] By a special order of April 3, 1934,[18] they were called upon to deliver as much as the individual peasants. By a special order of August 3, 1934,[19] the individual peasants for whom plans were not established had to deliver 50 percent more per acre sown than the kolkhozy not served by MTS. Those for whom plans were established were obliged to deliver 5–10 percent more than those kolkhozy; the rate was equivalent to half the norm for acreages in excess of the plan.

In addition to the obligatory deliveries and voluntary sales of their kolkhozy, and to their own deliveries and sales if they had sown any grain, the kolkhozniki as well as the individual peasants, like all other consumers, had to pay for custom grinding of their grain exclusively in kind (see, for example, the order of September 27, 1932). Moreover, the rates established for this grinding were excessive, and the provisions on custom grinding actually implied another tax in kind. For example, the rate for grinding wheat to whole meal, reduced on February 6, 1935, still was 10 percent of the ground grain or twice the rate normally charged by private millers in Czarist times. The yearly return of grain obtained by the state for the grinding averaged over one million tons in 1937–39.

Beginning with 1940 the assessment of grain per hectare planned was replaced by the assessment per hectare of arable land in possession of the kolkhozy. The order prescribing the new system of procurements, dated April 7, 1940, mentioned only the total quantity of grain to be procured as obligatory deliveries from the kolkhozy, kolkhozniki, and individual peasants in the whole Union.[20] The only details given were that the kolkhozy not served by the MTS had to deliver 15 percent more than the kolkhozy served by them, and that the kolkhozniki and individual peasants were to deliver 0.6 quintals per hectare more than the kolkhozy served by the MTS.

The 15.16 million tons ordered to be procured from the 1940

[16] *Most Important Decisions on Agriculture* (2d ed.), pp. 563–64.
[17] *Ibid.*, p. 577. [18] *Ibid.*, p. 592. [19] *Ibid.*, p. 599.
[20] *Most Important Decisions on Agriculture of 1938–40*, p. 368.

grain crop of the kolkhozy, kolkhozniki, and individual peasants, compared with 10.0 to 10.5 million tons procured from the kolkhozy in 1937–39 (see Table 60, p. 738) plus at most 0.8 million tons obtained previously from the kolkhozniki and individual peasants[21]—a total of about 11 million tons. Thus the change in the system of assessment was accompanied by a substantial boost of the total quantities procured.

The payment for custom grinding in kind was discontinued after July 1, 1940 (order of April 15, 1940). The order prescribed that the amounts of grain formerly paid by the kolkhozniki for custom grinding were thereafter to be assessed among the kolkhozy as obligatory deliveries. There is no indication that these additional quantities were to be part of the 15.16 million tons prescribed as the total obligatory grain deliveries by the order of April 7, 1940.[22] That a substantial increase in procurements from the kolkhozy was contemplated is indicated by the planned increase in centralized procurements of grain from 31.8 million tons in 1937 to 41.0 million in 1942.[23] All grain obtained by the state from the kolkhozy increased by 6.72 million tons from 1939 to 1940, obligatory deliveries by 4.52 million tons.

The order of July 11, 1942 brought into existence a special grain fund for the Red Army amounting to 2,377,000 tons, assessed and paid for in the same way as the obligatory deliveries. The order pertained to the 1942 crop only, but the fund was also collected in later years. As late as November 1946 it appeared not to have been abolished. The payment in kind for the grinding of grain also was restored during the war and has continued thus far.

The price paid for delivered grain remained unchanged from 1928–29 to 1934–35 inclusive.[24] With the 1935 crop, the procurement prices were increased 10 percent in connection with

[21] Both categories of growers had between them only 1,781,400 hectares in grain crops in 1938.

[22] Incidentally, the replacement of the payment for grinding in kind by obligatory deliveries implied that the grain formerly obtained in exchange for the service of grinding would henceforth be obtained practically gratis.

[23] *3d Plan*, p. 232.

[24] For prices in 1927–28 to 1931–32, see *National Economy USSR: Statistical Handbook, 1932*, Central Office of National-Economic Accounting (Moscow, 1932), pp. 352–53. The procurement orders of 1932–34 either did not mention prices or said that prices remained unchanged.

the abolition of bread rationing and the enormous increase in the retail prices of grain and grain products in regular government and co-operative stores (see pages 551 ff.). Thus while the new procurement price of oats in the areas mentioned in *National Economy USSR . . . . 1932* was 4 to 6 kopeks per kilogram, the government's new retail price of oats was 55 to 100 kopeks. Correspondingly, the new procurement price of rye was 4.6 to 6.9 kopeks and the new retail price of rye bran was 60 to 100 kopeks. The retail price of farina (of poor quality) was 60 to 70 times the procurement price of wheat.

An increase in the wheat price by 1.20 rubles per quintal (order of February 11, 1936), two raises in the price or exchange value of buckwheat (orders of March 23, 1935 and May 27, 1940), and similar minor changes are the only adjustments that were made in prices paid for delivered grain in the following years, in spite of the rapidly growing inflation. The government still pays producers about 10 kopeks per kilogram for delivered wheat while—since the fall of 1946—charging the consumer 13 rubles for a kilogram of wheat flour (probably of 85 percent extraction), more than 100 times as much in terms of grain.

Sunflower seed.—The procurement system for this crop is the same as for grain, but the delivery quotas are much higher in proportion to the yield. The rates for 1934 (lower than those for 1933 and apparently remaining in force in the following years) compared as follows with the 1932–34 average yields in the principal growing regions:[25]

	Delivery rates (*quintals per planned hectare*)			Actual yield (*quintals per hectare*)
	Kolkhozy served by MTS	Kolkhozy not served by MTS	Individual peasants	
Central Chernozem	3.2	3.5	10 to 15 percent above the rates for kolkhozy in the same area.	8.1
North Caucasus	3.2	3.5		6.0
Ukraine	3.0	3.3		6.1

Thus the quotas amounted to about 50 percent of the yields obtained at that time, even for the kolkhozy served by MTS. In

[25] Delivery rates from *Most Important Decisions on Agriculture* (2d ed.), pp. 590 and 662; yields from *Agriculture USSR, 1935*, p. 389.

establishing these high delivery quotas for sunflower seed it was probably taken into consideration that the seed requirements of the sunflower are small and that the crop is not used for feed. However, to compensate for the relatively higher delivery quotas, the sunflower seed delivered should at least have been paid for at proportionately higher prices than grain, but this was not done.

For regions poorly adapted to sunflower and where little therefore was grown, the delivery quotas were established at much lower levels than the quotas for grain in the same regions and for sunflower seed in the principal sunflower areas. For example, the kolkhozy served by the MTS in Chelyabinsk oblast, located outside the principal sunflower area, and in North Caucasus krai, located in the heart of this area, were to deliver the following quantities of grain and sunflower seed in 1935 (quintals per planned hectare):

Product	Chelyabinsk oblast	North Caucasus
Grain	1.2	1.9
Sunflower seed	0.6	3.0

Although the low delivery quotas in outside areas depressed the average deliveries, the kolkhozy of the USSR delivered 27.0 and 38.7 percent respectively of their 1937 and 1938 sunflower crops to the government.[26]

Since 1940 the kolkhozy have been delivering sunflower seed on the basis of all arable land in their possession. Neither the total deliveries nor the per-hectare quotas were announced. However, while the sunflower acreage was expected to decline during the 3d Plan Period from 3,250,000 to 3,150,000 hectares (Table 42, p. 503), the 3d Plan scheduled an increase in centralized procurements of sunflower seed from 1,076,000 tons in 1937 to 1,650,000 in 1942 (Table 3, p. 79). This implied a large increase in the procurement quotas per hectare of sunflower.

Kolkhoz members and individual peasants were to deliver 2 and 3 quintals per hectare respectively, according to regula-

[26] T. L. Basyuk, *Organization of Kolkhoz Production* (Moscow, 1946), p. 273; and A. Arina, "Kolkhozy in 1938," *Socialist Agriculture*, December 1939, p. 64.

tions in force since 1940.[27] Thus for these producers the formerly exaggerated regional differentiation of delivery quotas suddenly disappeared.

The procurement price of sunflower seed, which was 7.63 to 7.93 rubles per quintal in the principal sunflower areas in 1928–29, was raised to 9 rubles by 1931–32,[28] to 15 rubles in March 1935, and to 20 rubles on May 22, 1946. In the fall of 1946 it was less than one-hundredth of the retail price of vegetable oil distributed on rations and at most one five-hundredth of the price of vegetable oil in Moscow kolkhoz markets.

The high quotas for the obligatory delivery of sunflower seed certainly have much to do with the failure of the production plans for this crop. This policy is especially questionable in view of the desperate shortage of fats.

Potatoes.—The procurement system for potatoes is also the same as for grain, but the quotas to be delivered, when brought in relation to the crop, were substantially less than those on grain in the 'thirties. For example, for White Russia, with a 1932–34 average yield of 97.4 quintals per hectare, the quotas were as follows in 1933 (in quintals per planned hectare):

Kolkhozy served by MTS	9
Kolkhozy not served by MTS	12
Kolkhozniki	13
Individual peasants	15

The reasons for the lower delivery rates of potatoes are not clear. The fact that the seed requirements for potatoes are slightly higher (on a percentage basis) than for grain was probably only one of them. The expansion of the kolkhoz potato acreage may have needed to be encouraged, but the inability of the government procurement apparatus to handle large quantities of the perishable potatoes was probably a major factor.[29] Since the delivery obligations for kolkhoz peasants as well as individual

[27] *Most Important Decisions on Agriculture of 1938–40*, p. 416.

[28] *National Economy USSR . . . . 1932*, p. 351.

[29] The decision of the Party of June 4, 1936, "On the Harvest and Procurements of Farm Products," *Finance-Economic Reference Book for Kolkhozy*, p. 42, contained the following sentence: "Drawing attention to the exorbitant costs of procuring, storing, and selling potatoes and fruits, to intrust the Government to take measures toward maximum cutting down of those costs in industrial centers."

peasants were per hectare of potatoes as planned for them, they had to deliver whether they planted or not.

As in the case of sunflower, the order of April 16, 1940, which introduced the assessment of potato deliveries per hectare of total arable land, did not state either the per-hectare rates for the kolkhozy or their total deliveries. Since the 3d Plan called for an increase in the centralized procurements of potatoes from 7,020,200 tons in 1937 to 13,000,000 tons in 1942,[30] a marked rise in delivery quotas per hectare planted to potatoes was implied.

The delivery quotas for potatoes by the kolkhozniki and individual peasants as before had to be per hectare of land in potatoes, as planned in Moscow, but the individual peasants were discriminated against even more than before. Following are the quantities that were to be delivered by those producers in specified areas (in quintals per planned hectare of land in potatoes):[31]

	Kolkhozniki		Individual peasants	
Region	1933	1940	1933	1940
White Russia	13	12	15	20
Kursk oblast	15	10	16	15
Ukraine	11	8	12	14

Meat.—The principle of assessment of meat deliveries from the kolkhozy varied. In 1937 and 1938 the deliveries were based on the total herds supposed to be available on January 1, 1937 and January 1, 1938, respectively, according to plan.[32] The quotas for cattle varied from 10 to 15 kilograms live weight per head according to region. The principal hog areas were to deliver 32 kilograms of hogs (live weight) per head; the secondary regions 22 kilograms. The quota for sheep was uniformly 5 kilograms per head. The average outturn of slaughter animals in the Union was at the rate of 60–65 kilograms per head of cattle available on January 1 of the respective year, of 80 kilograms per hog, and 15–20 kilograms per sheep. This

[30] *3d Plan*, p. 232.

[31] Order of Apr. 16, 1940, *Most Important Decisions on Agriculture of 1938–40*, pp. 390–91.

[32] Order of July 31, 1936; see *Finance-Economic Reference Book for Kolkhozy*, pp. 365–68.

indicates that deliveries had to amount to about 30 percent of the output. The same percentage is implied in the official figures on output and deliveries by the kolkhozy in 1937, if it is assumed that the figures on output of meat and fat included slaughter animals sold alive and that the average yield of carcass meat and fat was 50 percent of the live weight.[33]

According to the order of July 31, 1936 the kolkhozniki of the kolkhozy without commercial fermy were to deliver 25 or 32 kilograms live weight per household per year depending on the area; the kolkhozniki of the kolkhozy with commercial livestock fermy, 15 to 25 kilograms respectively. The average quota for individual peasants was 45 kilograms per household. We have mentioned (p. 370) that the delivery obligation applied whether or not the household had any livestock. The measures of exacting deliveries were also discussed above. The large obligatory deliveries from the very small livestock holdings of the kolkhozniki, and the need to rebuild those holdings with the animals that remained, resulted in a decline in rural meat consumption even from the extremely low level of the early 'thirties (see Chart 7, p. 92).

On January 1, 1940,[34] a system of deliveries similar to that for grain, sunflower seed, potatoes, and some other crops was introduced for meat, the assessment being per hectare of total agricultural land in the possession of each kolkhoz. The quantities of meat to be delivered per hectare by the kolkhozy varied from 0.5 kilogram (live weight) in the former seminomadic areas to 4.5 kilograms in the Ukraine and Krasnodar oblasti.[35] These quotas implied a great increase in deliveries from the same herds.

The principle of assessing meat against the kolkhozniki and individual peasants per household, regardless of whether they had any livestock, remained unchanged, but the quotas were raised sharply despite the declining trend in their holdings (see

[33] *Kolkhozy in the 2d Stalin Five-Year Period*, Gosplan (Moscow, 1939), p. 105. The same official source indicates that another 50 percent of the output of meat and fat was marketed by the kolkhozy in addition to the obligatory deliveries. Of this additional quantity about one-third went to the state (this is implied in the data in *Socialist Agriculture USSR, 1938*, p. 45). It is unlikely that all additional marketings were entirely voluntary.

[34] Order of July 8, 1939, amended by the order of Sept. 17, 1939.

[35] *Most Important Decisions on Agriculture of 1938–40*, pp. 356–57.

pp. 346–47). All kolkhoz households were required to deliver 32 to 45 kilograms live weight, depending upon the area, as against the previous rates of 15 to 25 kilograms for the households of kolkhozy with commercial livestock fermy (from 1939 on, all kolkhozy were supposed to have these fermy). For the individual peasants the quotas were raised from 40–50 kilograms to 64–90, in both cases depending upon the area.[36]

At roughly 33 kilograms each, the 18.8 million kolkhoz households would have to deliver around 620,000 tons live weight. At the average output rates in the Union the livestock of the kolkhozniki as of January 1, 1940 would have yielded around 2.6 million tons live weight. But owing to shortage of good feed this output would be unattainable for the kolkhozniki even if they did not have to "sell" to their kolkhozy large numbers of young stock (see page 347). The obligatory deliveries of the kolkhozniki certainly exceeded 25 percent of the actual output of their slaughter animals. Furthermore the kolkhozniki had to sell part of their output on the side to get needed cash. All in all there remained hardly more than 10 kilograms of meat (including fat) per kolkhoz peasant on the average from their own production. Many kolkozniki and an even greater percentage of the individual peasants would have had to buy the livestock, at prices tens of times higher than those they received from the government, in order to fulfill their delivery obligations.

The low prices paid for the obligatory deliveries of meat, as well as for milk and most other livestock products, are evident from the small cash receipts of the kolkhozy from the obligatory deliveries of all animal products (see pp. 686–87).

Milk.—The quotas of milk to be delivered varied considerably with the region. Except in the nomadic areas, the annual quotas ranged as follows in 1934 (in kilograms per cow):[37]

Kolkhozy with or without commercial dairy fermy.....	350 to 580
Kolkhozniki of kolkhozy having commercial dairy fermy..	50 to 180
Kolkhozniki of kolkhozy without commercial dairy fermy..	75 to 220
Individual peasants	120 to 280

[36] *Most Important Decisions on Agriculture of 1938–40*, pp. 358–59.

[37] *Most Important Decisions on Agriculture* (2d ed.), pp. 612–14.

The government order of December 1, 1934 clarified the expression "per cow" by emphasizing that cows not in milk in a delivery year were not exempt in computing obligatory deliveries.

The kolkhozy delivered to the state the following percentages of their total output of milk and milk products in terms of milk: 1935—45.5; 1936—44.8; 1937—44.0.[38]

Since most kolkhoz households were allowed to have only one cow and the average yield of milk per cow was only around 1,000 kilograms, the most that could remain for themselves and for the indispensable sale in kolkhoz markets, after fulfilling the government deliveries and feeding the calf, was 170 kilograms of milk and dairy products in terms of milk per capita. The government left it to the kolkhoznik to worry about the deliveries if his cow happened not to be fresh.

Since January 1, 1941 (order of January 18, 1941) the obligatory deliveries of milk by the kolkhozy have been fixed along the same lines as for most other products. The kolkhozy are required to deliver 3 to 30 kilograms of milk per hectare of agriculturally used land, depending upon the area. The quota established for the Ukraine, for example, was 22 kilograms. A huge boost in the delivery obligations was implied in these quotas. The quotas were reduced 10 to 30 percent for the first year of operation of the new regulations.

Other foodstuffs and feed.—The regulations pertaining to the procurement from kolkhozy, kolkhozniki, and individual peasants, of other foodstuffs such as vegetables, fruits, and eggs, as well as feedstuffs (hay) do not differ enough from those for the foodstuffs already discussed to merit space.

Cotton.—The procurements of cotton are based on contracts to deliver the whole crop from an area decided upon at a higher level. The contract is simply a form of acknowledgment by the producers that they must grow a stated acreage of cotton and deliver the output in excess of the quantities due the MTS. The grower indeed even undertakes to secure a minimum yield per hectare, but there is no penalty for failure to attain it. The con-

[38] *Kolkhozy in the 2d Stalin Five-Year Period*, p. 105.

tract contains the statement that it has the power of law and mentions criminal prosecution for violation.[39]

Until January 1, 1935, the producers were paid prices differing little from those of pre-collectivization times. In partial compensation for the rapid inflation, they received seed, fertilizer, feed grain, tea, sugar, oil, linter, oilcake, industrial goods, and especially bread grain, at low prices. Advances in money and goods were also made. An additional reason for providing the grain was the desire to prevent growers from using the irrigated land for this crop rather than cotton.

After January 1, 1935, the delivery of grain to cotton growers was discontinued, and they had to pay the regular high prices for it. Simultaneously the procurement prices of cotton were raised in Central Asia to almost four times the level of 1926–27, and in North Caucasus and Ukraine to almost five times. The increase was even greater for South Caucasian cotton. The new cotton prices nevertheless remained below what they should have been according to the value of money. The disproportion was partly made up by continued deliveries of seed, fertilizer, oil, linter, and oilcake to the producers at low prices. That the new cotton prices were still low is obvious from the huge premiums the government was able to offer for cotton delivered in excess of the planned yield. The lowest premium was 50 percent added to the basic price on each quintal delivered in excess of a planned yield of 6 quintals of seed cotton[40] per hectare; the highest was 200 percent for each quintal delivered in excess of a planned yield of 15 quintals of seed cotton. However, cotton became relatively the best-paid-for of the major crops.

Deliveries of grain to cotton growers at privileged prices were resumed during the war and have since been continued.

Sugar beets.—The sugar beet is another crop delivered in full on contract. Since only a relatively small proportion of the total acreage is in sugar beets, the producers do not get as much encouragement as the cotton growers. In 1936 the acreage in sugar beets was not subject to the agricultural tax. The seed was provided gratis and fertilizer was provided at low prices.

[39] See, for example, Article 23 of the Model Contract for Irrigated Cotton in 1936, in *Finance-Economic Reference Book for Kolkhozy*, p. 127.

[40] Seed cotton is unginned cotton.

Stated, but very small, quantities of sugar were supplied at preferential prices. But the price paid in that year for sugar beets in the principal sugar regions was only a little more than double that of 1926–27 (2.20 rubles per quintal as against 1.02 rubles).

Premiums for excess production were even larger on sugar beets than on cotton. The lowest premium to the kolkhoz was 50 percent of the basic price, and the highest 400 percent—the latter for production in excess of a planned yield of 20 tons per hectare in the principal sugar-beet areas and above 16 tons per hectare in other areas. Premiums for excess deliveries were furthermore provided to the kolkhoz chairmen, the brigadiers, and the MTS. This extravagance at the expense of the unfortunate peasants who happened to be members of poorly directed kolkhozy could take place only because the basic price was extremely low.

KOLKHOZ MARKETS AND GOVERNMENT COMMERCIAL STORES

Kolkhoz markets.—The kolkhoz markets are a unique institution which would be found very inadequate even in the most backward economy. In the Soviet Union they are hailed as an institution which has been developed "on the basis of the definite victory of the kolkhoz system,"[41] and also as "a form of Soviet trade."[42] Actually, the kolkhoz markets represented a capitulation both to peasants, who by the sale of a portion of their produce at exorbitant prices were getting some compensation for delivering another portion to the government at low or token prices, and to the hungry city dwellers, who were eager to get food even at these exorbitant prices, because the supplies obtained by the government through obligatory deliveries and otherwise were quite inadequate to provide them with a bearable minimum. The kolkhoz market is discussed at this particular point because of its nature as a supplement to obligatory deliveries to the state.

[41] See the order of the government and Party of May 6, 1932, "On Organizational Problems in Connection with the Plan of Grain Procurements from the 1932 Crop and with Development of the Kolkhoz Trade in Grain," *Most Important Decisions on Agriculture* (2d ed.), pp. 533–35.

[42] I. Pisarev, "Kolkhoz Trade in City Markets," *Socialist Reconstruction of Agriculture*, November 1935, p. 182.

Private trade certainly did not fit into a fully socialized agriculture, the realization of which was the aim of the big collectivization drive. But since the legal channels fell far short of satisfying the needs, private trade continued to function with prices rapidly soaring. At first the markets where this trade went on were merely tolerated, but in 1932 they were legalized and given the name kolkhoz markets; as such they replaced a greater chaos with a lesser one. However, the Party refused any concessions to private traders; their extinction was to continue. Article 10 of the order of May 20, 1932 emphasized: "Private traders are prohibited from having stores; and all kinds of intermediaries and speculators, who try to profit from workers and peasants, are to be exterminated by all means." Thus a kolkhoz market is a legally designated place where the kolkhozy, kolkhozniki, and individual peasants (except kulaki) sell their own products direct to consumers at free prices.[43] The income of the kolkhozy and kolkhozniki from sales in the kolkhoz markets is even exempt from the agricultural tax. For the individual peasants, as usual discriminated against, the taxation of such incomes has merely been reduced.

The right to sell grain (including rice), sunflower seed, and potatoes in the kolkhoz markets is restricted by the requirement that the whole oblast or krai must first have fulfilled its obligations to the government (including the payment to the MTS) and have set aside the minimum seed and feed funds.[44]

The turnover of the kolkhoz markets amounted to 7.5 billion rubles in 1932, the first year they were officially recognized. The figure jumped to 11.5 billion in 1933, then rose to 14.0 billion in 1934 and to 14.5 billion in 1935.[45] For 1938 it was estimated at 24.4 billion rubles.[46] These huge figures in part

[43] See the order cited in note 41, and especially the order of May 20, 1932, "On the Procedure in Sales by Kolkhozniki and Working Individual Peasants and on the Reduction of the Sales Tax on Farm Products," *Most Important Decisions on Agriculture* (2d ed.), pp. 535–36.

The word "free" would not be tolerated in the Soviet Union in connection with "prices"; the legal formula is "at prices as they form in the market."

[44] See, for example, the decision of the Party of July 4, 1936.

[45] *Socialist Construction USSR, 1936*, Gosplan (Moscow, 1936), p. 606.

[46] A check of all figures shown in the text is impossible because the statistics of turnover in kolkhoz markets, though collected, are not released. The methods of collecting them are described by N. S. Margolin, *Problems of Balance of Money Incomes and Expenditures of the Population* (Moscow and Leningrad, 1939), pp. 64–65. He acknowledges their shortcomings. These probably consist in exaggerating the average prices paid.

merely reflect the enormous inflation. However, according to official computations, the kolkhoz markets accounted for 24.7 percent of the total food turnover in 1938. This was not much less than the proportion handled by the private trade in the last years before collectivization.

Since any one kolkhoznik has little to sell, an unconscionable waste of labor is involved in this form of marketing. According to Kagarlitskii's report published early in 1940, the kolkhoznik women of the suburban areas who had milk to sell traveled to the city markets regularly every second day.[47] In more distant areas they took the milk to market every fourth or fifth day. More than 7,000 kolkhoz women were bringing milk to Moscow daily, 2,500 to Leningrad, and about 2,000 to Dnepropetrovsk, according to Kagarlitskii. He said: "With the existing form (of kolkhoz trade) masses of kolkhozniki are coming to the markets, and this adversely affects the labor organization of the kolkhozy."[48] There is also a great waste of time on the part of the purchasers, particularly since it is profitable for them to trade in markets as near the producers as possible.

An inevitable accompaniment of this peculiar form of trade is the wide price variations, not only from region to region but within each region and even each district. Chart 24 shows this situation for three points in Rostov oblast. In kolkhoz markets near Moscow, perishable products frequently cost several times as much as in similar markets located in distant surplus areas. The prices drop with each mile from the city center.

The chaotic state of the kolkhoz markets, which reportedly turned over a quarter of all marketed food in 1938, may be illustrated by the following quotation from Shepilov's book, a Party publication:

> The kolkhoz assembly of the artel named for Shchors in the Slavyansk raion [Ukraine] decided to sell in the market 3,135 quintals of cabbage for 41,350 rubles; actually the board sold 1,249 quintals [i.e., little more than a third] . . . . for 129,463 rubles. In the same raion the kolkhoz named for the XVth Party Congress sold rice on the Slavyansk market at 7 rubles per kilogram on January 23; at 8 rubles on January 28; at 10 rubles in February; and at 12 rubles somewhat later in February. The kolkhoz of the

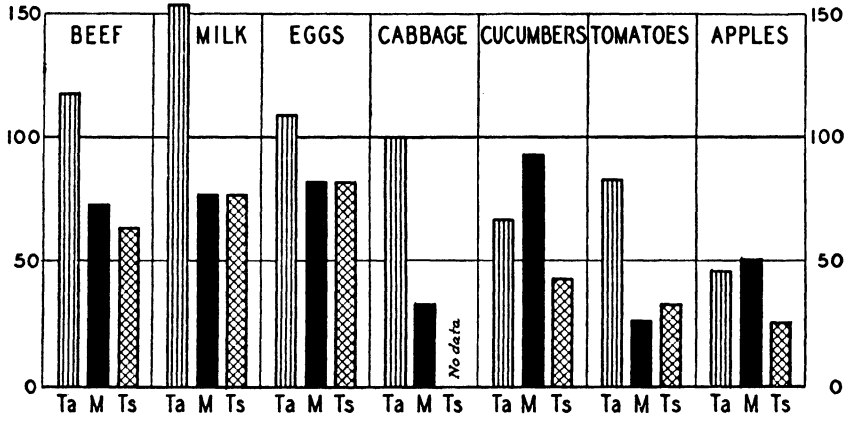
[47] P. Kagarlitskii, "On Kolkhoz Market Trade," *Problems of Economics*, March 1940, p. 96.

[48] *Ibid.*

Odessa suburban zone named for Carl Libknecht sold potatoes at 3 rubles per kilogram [43 times the 1928 retail potato price in Moscow]. When the potatoes were ripe in the neighboring kolkhoz named for the 51st Perekop Division and this started to sell them at 120 kopeks per kilogram, the "managers" of the Libknecht kolkhoz closed their store and waited until the Perekop kolkhoz had sold out. After that they established an even more extreme price of 3.50 rubles per kilogram.[49]

CHART 24.—PRICES IN SPECIFIED KOLKHOZ MARKETS OF ROSTOV OBLAST, AUGUST, 1939*

(Percent of respective prices in Rostov)



* Data in Chart Appendix. The markets are Taganrog (Ta), Millerovo (M), and Tsymlyanskaya (Ts).

In spite of the objectionable nature of the kolkhoz markets, there was no hope of getting rid of them. They were, indeed, accepted as a permanent institution. Their turnover was expected to more than double during the 3d Plan Period, and reach the huge figure of 40 billion rubles in 1942.[50]

The kolkhoz markets continued to function during the war. Prices in urban centers rose 12.6 times on vegetable products and 13.2 times on animal products from 1940 to 1943 according to Voznesenskii, president of the Gosplan,[51] but even these great rises apparently are underestimates. The 4th Plan preserves the kolkhoz markets in full.

The acute food shortage of 1946 brought a modification in

[49] D. Shepilov, *Socialist Kolkhoz Property* (Moscow, 1940), pp. 121–22.

[50] Kagarlitskii, *op. cit.*, p. 93.

[51] N. A. Voznesenskii, *War Economy of the USSR during the Great Patriotic War* (Moscow, 1948), p. 129.

the organization of trade in farm products at free prices. By a government order of November 9, 1946, consumers' co-operatives are permitted to purchase farm products from the kolkhozy and kolkhozniki (after these producers have fulfilled their delivery obligations; in the case of grain and dry legumes after the corresponding oblast or republic has fulfilled its obligations) at free prices, and to sell them to consumers at prices no higher than in government commercial stores (see below). The magnitude of such trade planned for 1947 was very small; in the case of meat and poultry, for example, only 17,000 tons were expected to be involved—about one-half pound per urban dweller.[52] However, the co-operatives provide an indispensable link between producers and consumers that the kolkhoz markets do not offer, and this type of trade may acquire considerable importance if it is permitted to continue after the passing of the emergency that brought the new measure into existence.

The idea of the kolkhoz market—in the particularly abortive form in which it existed before November 9, 1946—has even been exported to the Soviet zones of Germany and Austria, where it has replaced the much superior system of pre-invasion time. Then, every farmer had to deliver all surpluses at more or less fair prices. Now he has to deliver rather stiff quotas at unprofitable prices. But if he is fortunate enough to have anything left he is allowed to compensate himself by squeezing the hungry consumer, after the manner of his counterparts over the border.

Government commercial stores.[53]—When in the early 'thirties the legalized kolkhoz markets showed success of a sort under the prevailing conditions, it was decided that the state might as well share in the big money moving in that trade. It is true that sales of consumer goods by the state in special commercial stores at enhanced prices had already started in 1929, but at first they were limited chiefly to non-food products. In the spring of 1933, on Stalin's initiative, bread was added; and other food products soon followed.[54] The turnover of these commercial stores soared from 3.9 billion rubles in 1932 to 13.0 billion in 1934. Their

[52] For details see N. Sidorov, "Development of Co-operative Trade in Cities," *Planned Economy*, November-December 1946, pp. 16–24.

[53] For details, see L. E. Hubbard, *Soviet Trade and Distribution*, pp. 55–60.

[54] See G. Y. Neiman, *Internal Trade of USSR* (Moscow, 1931), p. 238.

share in the total turnover by government and co-operative stores of food products subject to state planning and regulation increased from 4.7 percent in 1932 to 18.2 percent in 1934.[55] Of butter and of vegetable oil and margarine, respectively, 42.5 and 39.5 percent of the total retail sales by the state and co-operatives were made in government commercial stores[56] at high or exorbitant prices.

On October 1, 1935, most foodstuffs and several industrial consumer goods were removed from the ration list, and on January 1, 1936 rationing was completely ended. The system of providing small amounts of rations at low prices in regular stores and offering additional quantities in commercial stores at exorbitant prices was replaced by providing unlimited quantities at stiff prices. When little is available for consumption, little can be consumed. The alternative in bringing this about is between full rationing and high prices. In the Soviet Union, where supplies have been short for the last twenty years, partial rationing in combination with high prices for the unrationed part alternates with high prices alone.

Rationing was resumed in 1941 and trade in food in government stores in 1944. The extreme shortages of the war and early postwar periods made the state commercial stores particularly profitable. What they lacked in volume of turnover they made up through the extreme margins of their prices over those in regular stores.[57]

[55] Neiman, *op. cit.*, pp. 239–40.

[56] *Ibid.*, p. 213.

[57] The abolition of rationing in 1947 restored the status established in 1935—unlimited supplies at prices that make possible only small purchases.

CHAPTER XVII

MAN POWER: UTILIZATION

THE CENTRAL PROBLEM

However much the role of the machine in Soviet agriculture may have been emphasized, man has proved the crucial factor. This idea has gradually penetrated the minds of even the most ardent machine enthusiasts. Whatever the defects in the mechanization of Soviet agriculture (see especially chapter xix), the failure to arrange for efficient use of man power has been decisive in the failure of the kolkhoz system to become a sound part of a permanently sound economy.

Cheshkov expressed the general opinion of the time when he wrote, in 1931: "In the next few years, in view of the rapid tempo of mechanization of agriculture, tens of millions of agricultural population will be released . . . ."[1] By and large, the present writer held the same opinion. The release of huge masses of farm people seemed certain, though many obstacles were foreseen. The obstacles, however, proved far in excess of those visualized, and the number of persons released from farms turned out greatly below that expected. Since the anticipated productivity of industrial labor also materialized to only a relatively moderate extent, the outcome was a general shortage of labor rather than a large surplus.

It is questionable whether it would have been possible to organize the kolkhoz labor force properly if the kolkhozy had been permitted to retain all their proceeds to pay the members for their labor. When the state took the lion's share of those proceeds, failure was inevitable.[2]

While the recovery of agriculture proceeded at a relatively

[1] A. F. Cheshkov, "The Role of MTS in Socialist Reconstruction of Agriculture," *Socialist Reconstruction of Agriculture*, July 1931, p. 53.

[2] The writer's failure to foresee the full extent to which the Party would go in underpaying the kolkhozy for their produce, and in ignoring their food needs, is the principal reason for his misjudging the probable effect of collectivization on man power.

rapid rate during the Second Plan Period, the reward of the kolkhozniki per day of work for the kolkhozy was increasing only slowly. Around 1937–38, when this payment was highest, it was little more than 40 percent of the corresponding income of the rural population before collectivization. The subsequent decline, slow at the start, was greatly accelerated during the war.

The twenty years of full collectivization represented an uninterrupted but unsuccessful search for a system of payment which would insure adequate work for the low reward that could be offered.

In the late 'twenties, payment according to work done was proclaimed the basic principle of the kolkhozy. In 1931 the trudoden was made the unit of measurement for the work of the kolkhozniki. Payment according to work was introduced to prevent those who did not work properly from participating fully in the proceeds. But the whole emphasis was on establishing a graduation in payment according to the amount and quality of work performed. Later, the idea began to dawn that it is not enough to pay less for little poor work than for much good work, but that it is also necessary to make the payment for much good work large enough to cover at least moderate living requirements. To "make the trudoden full-weighty," i.e., to assure a reasonable payment for the work of the kolkhozniki, had become one of the urgent requests. It was repeatedly proclaimed that the trudoden is the tie between the kolkhoznik and his kolkhoz, and that a low value of the trudoden would break that tie.

Instead of increasing considerably, the initial low value of the trudoden was at best barely maintained in the first years of the collectivization period when the kolkhoz output was expanding at a relatively rapid rate. The value of the trudoden declined in 1937–40, and underwent a big drop during the war. In 1946 and in 1947 the drive for a "full-weighty" trudoden was again in full swing,[3] but under conditions that make the results more than problematical.

[3] Among the latest such pronouncements is that of the 4th Plan. The increase of the value of the trudoden is given as one of the principal aims of the order of Sept. 19, 1946, and of the Council created by that order (see pp. 332–33). Of the four economic articles in *Socialist Agriculture*, October-November 1946—the issue following that order—three dealt with the value of the trudoden and payment of the kolkhozniki in general.

Since it was impossible to make the value of the trudoden attractive, resort was had to premiums in kind. The premium system has advantages, but these are at least partially offset, perhaps even overbalanced, by the disadvantage that it inevitably undermines the value of the trudoden. The idea that premiums are paid from surplus production is unrealistic.

Under the given conditions, compulsion necessarily played a great role among the measures taken to make the kolkhozniki work. This indeed has been imposed with ever increasing harshness. Compulsion, however, can insure only time at work, not quantity, nor, certainly, quality of work.

THE OBLIGATION TO WORK AND THE WORK ITSELF

Early legislation.—The kolkhoz is naturally based on the labor of its members. The 1930 Artel Charter declared: "All operations are performed by the personal work of the members. . . . . No kolkhoz member is permitted to refuse the work assigned to him" (Articles 12 and 13). Soon this general formula was believed inadequate. The inclusion of specific provisions was ordered on January 13, 1933, and these were later incorporated in the 1935 Artel Charter (Article 17). According to them, "failure to show up on the job without an adequate reason, poor work, and other violations of labor discipline . . . . ." must be penalized in various ways, such as by the loss of five trudodni, demotion to lower-paying jobs, temporary prohibition to participate in kolkhoz work, or expulsion.

Even these penalties did not carry the needed force. The loss of five trudodni, for example, was a serious threat only in exceptional cases where distributions per trudoden were substantial; and, where these exceptions occurred, breach of discipline was rare. Nor was temporary suspension from kolkhoz work always a serious threat. In fact, to get out of such work was becoming increasingly agreeable to many a kolkhoznik. The payment he could expect from the kolkhoz was so small and uncertain, and the disorganization of the economy had raised prices in the kolkhoz markets to such exorbitant levels (see pp. 383–87), that he found it preferable to put more labor into his own crops, or to work in other kolkhozniki's patch-gardens for pay, or to sell

their produce for them in the kolkhoz markets, or just to speculate.

Special provisions regulated the departure of the kolkhozniki from the territory of the kolkhoz for outside work. They sought mainly to prevent the kolkhozy from expelling such persons from the kolkhozy, or from discriminating against their families, who stayed behind, by not permitting them to work in the kolkhoz or restricting such privileges as the use of the kolkhoz pasture. However, according to a government order of March 17, 1933, only those absent kolkhozniki were protected who registered with the kolkhozy the contracts between themselves and the state organization.[4] This obviously implied that in case of absence for any other reason the kolkhoznik and his family were not protected. The reinstitution of the internal passport system in 1934 further restricted the freedom of the kolkhozniki to move around.

Days of labor around 1938.—Shirking kolkhoz work, however prevalent it may have been, was greatly exaggerated in official pronouncements. The official data on the labor input in 1939 compiled in Table 27 leave no doubt on this score.[5] The average of 228 days of work per person between the ages of sixteen and sixty, man and woman, in as seasonal an occupation as agriculture was certainly high. The number of days put in by the kolkhozniki in kolkhoz work, namely 153, was likewise large.[6] A study for the Ukraine similar to Merinov's disclosed that in 1938 the able-bodied kolkhozniki averaged 201.8 workdays in kolkhozy and on their own enterprises, of which 161.4 days were used on kolkhoz work.[7] Considering the low reward of the kolkhozniki and the seasonal nature of farming, it is surprising that

[4] Work for state organizations, such as sovkhozy, MTS, and industry, was a legal excuse from kolkhoz labor, but work in their own enterprises was not.

[5] The law passed in 1939 and discussed below (pp. 396–97) had little effect on the utilization of kolkhoznik labor by the kolkhozy in 1939. Merinov, whose data are presented in Table 27, used the decline in the proportions of those not participating and of those earning less than 50 trudodni from 1939 to 1940 as proof of the great effect of that law (see p. 17 of source for Table 27).

[6] The omission of persons aged sixty and over was justified by the fact that under Russian conditions a peasant who reached sixty years is old. Indeed, peasants over fifty-five are normally referred to as old.

[7] N. Stetsenko, "Labor Resources and Their Utilization in Kolkhozy of the Ukraine," *Socialist Agriculture*, July 1940, pp. 29, 31. From Stetsenko's figure for the total able-bodied persons it is obvious that children of twelve to sixteen were not included. It cannot be ascertained, however, whether he excluded the old people.

the kolkhozniki put in so many days on the kolkhoz work. The actual weakness of the kolkhozy lies not in the insufficient number of workdays but in the low labor intensity during worktime and the vast amount of the time spent on work returning little or nothing.

TABLE 27.—UTILIZATION OF KOLKHOZNIK LABOR IN 1939*

(*Days, except as noted*)

Item	Per household			Per person		
	Total	Men	Women	Average	Men	Women
Workers present (*number*) ..	2.13	.92	1.21	...	...	...
Supply of labor time	613.0	265.0	348.0	288.0	288.0	288.0
Labor time reported used[a]	485.7	253.6	232.1	228.0	275.7	191.8
For kolkhoz	325.6	195.3	130.3	152.9	212.3	107.7
For MTS	8.7	8.2	.5	4.1	8.9	.4
For state and co-operative organizations	47.2	32.8	14.4	22.2	35.7	11.9
On own enterprise	104.2	17.3	86.9	48.9	18.8	71.8
Labor time available for private needs[b]	127.3	11.4	115.9	59.8	12.4	95.8
Percent of total supply ...	*20.8*	*4.3*	*30.4*	...	...	...

* I. Merinov, "Labor Resources of Kolkhozy and Their Utilization," *Socialist Agriculture*, March 1941, p. 18. Able-bodied persons sixteen to below sixty years of age.

[a] Some duplication is involved; see text.

[b] The official formula is "unused or utilized for private needs."

The kolkhoznik men averaged not less than 276 days of work per year from a total of 288 potential workdays in the USSR in 1939 (Table 27). Only 4.3 percent of their total available labor time was not utilized for work in the kolkhoz, for outside work, or for work in their private gardens and on their livestock. In their other time the men must get fuel for the house, go to market occasionally, make repairs around the house, and so on. The officially computed 12.4 weekdays per man per year are not enough for all this. The discrepancy is explained by the fact that a certain amount of duplication is involved in the computation of workdays. Work on the private enterprises of the kolkhozniki is largely done before and/or after the day's tasks for the kolkhoz are performed.

The kolkhoz woman was even more overburdened with work than the man. It will be noted (Table 27) that the number of

days used for the private farm enterprises of the kolkhozniki was almost four times as large for women as for men. In the Ukraine the share of the women in work on household enterprises was 91.5 percent in 1937 and 95.3 percent in 1939.[8]

The Russian peasant family still lives primitively. All baking, sewing, and even some weaving, not to mention cooking and washing, are done at home, with only the simplest equipment. For example, the woman raises water from the well by hand and carries it, frequently a considerable distance, into the house. For all these household tasks she had only 95.8 weekdays a year, according to the computation in Table 27. Even if one assumes 120 weekdays, let us say, to allow for the duplication mentioned above, the figure is still amazingly small.

In the 430 kolkhozy whose 1937 operations were surveyed in detail, the labor force of the kolkhozy was composed of 40 percent adult men, 45.4 percent adult women, and 14.6 percent children twelve to below sixteen years of age. Adult men put in 57.5 percent of the total workdays, adult women 38.0 percent and children 4.5 percent.[9] In greater detail the data are as follows:[10]

Sex and age group	Average number of participants per household		Average workdays for the kolkhoz per person and year	
Adults, 16–59		2.108		145.0
Men	0.965		186.1	
Women	1.143		110.3	
Adults, 60 and over		0.154		130.6
Men	0.095		174.1	
Women	0.059		60.2	
Children		0.387		39.9
Grand total		2.649		128.8

It was greatly emphasized in the Union—without justification—that considerable numbers of kolkhozniki did not work for the kolkhozy at all or earned less than 50 trudodni per year. In 1938, 5.0 and 7.9 percent of the able-bodied men and women respectively did no work for their kolkhozy, while 9.9 and 21.4

[8] Stetsenko, *op. cit.*, p. 33.

[9] *Kolkhozy in the 2d Stalin Five-Year Period*, Gosplan (Moscow, 1939), p. 54.

[10] *Productivity and Utilization of Labor in Kolkhozy in the 2d Five-Year Period*, Central Office of Economic Statistics (Moscow, 1939), p. 126.

percent earned less than 50 trudodni.[11] An overwhelming majority of the able-bodied men who did not participate at all, or who earned less than 50 trudodni, had a legitimate excuse such as work in sovkhozy, MTS, forestry, or city industries. A total of only 7.9 percent of all farm women who limited their activities to care of family, house, a garden and some livestock, and who therefore did not participate in the other farm work, would be considered very small in most countries of the world. Furthermore, if over 78 percent of all farm women, in addition to all those activities did 35-40 days (the approximate equivalent of 50 trudodni) or more of other farm work, this would generally be regarded as a very heavy burden on farm people.

Although the kolkhozniki put in more days of work than would seem reasonable in view of the seasonal nature of agriculture, and much more than they did before the collectivization drive (see pp. 419–20), fewer persons were released from farms for industry than was necessary in view of the fact that productivity of industrial labor was also far from the desired level. Since there was no way to increase the effectiveness of farm labor, no choice was left but to ask for even more of it.

Discussing the labor situation in kolkhozy, summarized in Table 27, Merinov exclaimed: "An inexhaustible source for the further prospering of the kolkhoz system and the whole national economy exists in the correct and full utilization of these immense labor reserves."[12] He had to concede, however, that there were no considerable reserves of man labor. "The problem of fuller utilization of the labor of the kolkhozniki to a considerable extent boils down to the maximum drawing of women into collective production." He was eyeing not only the time the kolkhoz women spent on their private farm enterprises, but also the time left to them for their really titanic housework. For what passes for liberation from the family slavery and for equal rights,[13] the peasant woman has to pay by doing a large part of her housework on Sundays and at night.

[11] I. Merinov, "Labor Resources of the Kolkhozy and Their Utilization," *Socialist Agriculture*, March 1941, p. 16.

[12] *Ibid.*, p. 18.

[13] During a reception of shock-kolkhoz women in October 1935, Stalin said: "Only the kolkhoz life could annihilate inequality and put the woman on her feet."

The percentages of the available labor supply utilized for work in the kolkhozy and individual enterprises of the kolkhozniki in the Ukraine for the year 1938 and for July of that year were as follows:[14]

Sex	Annual	July
Men	84	90
Women	62	73

These certainly are very high rates of utilization for a seasonal industry conducted largely out-of-doors. Moreover practically every man not participating in kolkhoz work had a legitimate excuse of work in the MTS, sovkhozy, and the like. Stetsenko, however, arrived at the conclusion that the kolkhozy of the Ukraine could have released over one million able-bodied persons out of a total of 7.3 million for work in industry.[15] So far as some additional labor could have been released, it again would have meant more woman work for the kolkhozy, more "equality" for them.

Later legislation.— The flood of studies on the labor supplies of the kolkhozy in the late 'thirties, only a few of which can be cited here, was merely the literary accompaniment of vigorous legislative and administrative activity directed toward getting more labor days out of the kolkhozniki for their kolkhoz and toward liberation of kolkhoz labor for industry. The measures directed toward diminution of the size of private land holdings and livestock numbers of the kolkhozniki, with the aim of reducing the labor input in kolkhoznik private enterprises, are discussed on pages 341 ff. and 347–48. The order of the Party and government of May 27, 1939, "On Measures toward Safeguarding Collectivized Lands on the Kolkhozy from Being Squandered," which dealt primarily with curtailment of the kolkhozniki's land holdings, also attacked the problem of getting more work out of the kolkhozniki directly—by establishing compulsory annual minima for the trudodni earnings of able-bodied kolkhozniki. The reasons were stated thus:

In the kolkhozy there are not only honest working members, earning from 200 to 600 and more trudodni per year, who comprise by far the predominant portion of all kolkhozniki and who represent the basic power

[14] Stetsenko, *op. cit.*, p. 34.

[15] *Ibid.*, pp. 34–35.

of the kolkhoz movement, but there is also a certain portion of able-bodied kolkhozniki who continue to be counted as kolkhozniki, yet who sit on the neck of the kolkhozy.

The established minima (Article 14 of the order) were 100 trudodni in cotton areas, 60 trudodni in a number of regions with a short growing season, and 80 trudodni in all other areas comprising the bulk of agricultural Russia.[16] The law did not have any age limitations. While persons below sixteen were not meant to be included, old people were. It was recommended that the kolkhozniki who did not earn the prescribed minimum be expelled from the kolkhoz. "Recommended" is interpreted as an order. Kolkhozniki who did not earn the minimum without a legal excuse are considered as having lost their membership.

The minima were the same for men or women. The possession of children, however many, was no excuse. Since a woman averages less in trudodni per workday than a man, the established minima were actually higher for them. But the regulation was, in fact, directed primarily against women. Most men with no legitimate outside occupation were working in the kolkhoz anyway. According to Merinov, of the kolkhozniki who did not fulfill the minimum in 1939, only 19.8 percent of the men, but 72.3 percent of the women, had no legitimate excuse.[17]

The effect of the order establishing the minima was to raise the average number of workdays per able-bodied person on kolkhoz work from 211.8 in 1939 to 219.8 in 1940 for men and from 108.0 to 123.2 for women. This still was considered not enough.[18]

By an order of the government and Party of April 1942, the minima of trudodni to be worked by the able-bodied kolkhozniki in the kolkhozy, were increased from 100, 60, and 80 days respectively, in the regions designated above, to 150, 100, and 120. The total minima were subdivided into four portions: the minimum of 120 days, for example, had to consist of minima of

[16] The writer in his article, "The Plight of the Collective Farms" (*Journal of Farm Economics*, XXX, May 1948), unfortunately described the data given for compulsory work of the kolkhozniki (p. 317) as pertaining to the principal agricultural areas. Actually they were for the group of areas with short growing season.

[17] Merinov, *op. cit.*, p. 17. The persons without legitimate excuse were listed by Merinov as working in their private enterprises; they included also those engaged in private handicraft as well as persons sixty years and over.

[18] *Ibid.*

30 days to be earned by June 15; 30 days between June 15 and August 15; 40 days between August 15 and October 15; and the remaining 20 days by the end of December. A substantial minimum of 50 trudodni was established by the same order for kolkhoznik children between the ages of twelve and sixteen. These children were to be given workbooks and their trudodni had to be counted separately. Later, participation in the harvest was made obligatory for every kolkhoznik regardless of previous earnings.[19]

The minima were established, it will be noted, not only prior to the USSR's entrance into the war but before hostilities started abroad. The increase of the minima in 1942 and the other subsequent measures of this kind were motivated by war conditions, but were still in force at the time of writing.

Length of workday.—While the workday of city workers was seven hours (raised to eight in 1940), the kolkhoz peasants, according to law, were expected to work from sunrise to sundown as they had done before collectivization. The official efforts to increase the number of days worked by the kolkhozniki in their kolkhoz were paralleled by corresponding endeavors to enforce full workdays. By the end of the 'thirties, complaints became almost endless that the legal length of the working day was being violated and that the proportion of the gross workday actually worked was too small. The order of the government and Party of August 1, 1940, on the harvest and procurements in 1940, undertook (Section I, Article 20):

> . . . . to put an end to the intolerable practice that in some kolkhozy, MTS, and sovkhozy, kolkhozniki and the workers of the MTS and sovkhozy, instead of starting work at 5–6 o'clock, report for harvesting work at 8–9 o'clock and stop work in the field before sundown.

According to a special survey of spring work in 170 kolkhozy in 1940, the average gross length of the workday from departure to the field to end of work in the field was 11.9 hours in operations involving the use of animal power and 10.8 hours in operations performed by hand.[20] The net working times were 6.8 and

[19] See, for example, the order of the government and Party of July 13, 1945, on the 1945 harvest.

[20] F. Eliseev, "Utilization of Work Time in Spring Operations in Kolkhozy," *Socialist Agriculture*, March 1941, p. 30.

6.7 hours respectively. The official commentator believed that the worktime in operations performed by hand should be longer than in operations performed with draft power, and therefore regarded the prevailing situation as abnormal.[21] He did not consider it necessary to make allowance for the fact that the operations involving use of draft power are those performed by men, while hand operations are to a great extent women's and children's work. Even women and children had to work more than horses and oxen in the socialist state according to Merinov.

The workday has certainly been shorter in the kolkhozy than it was in private peasant farming, but one should not have expected more for the poor reward of the kolkhozniki. The high-pitched requests for work from laborers poorly paid and fed in a "socialist" state are really odd. Eliseev's ideas of the length of the labor day were as follows:

> With honestly working kolkhozniki, efficient organization of work, and strong regime and order of the workday, the net work [in spring operations] does not fall below 9 to 10 hours, with 15 to 17 hours the full length of the workday. For example, in the kolkhoz Komsomolets, Rossoshanskii raion, Voronezh oblast, at spring sowing the kolkhozniki start at 3:30 to 4 o'clock in the morning and stop at 8:30 to 9 in the evening.[22]

The order of August 1, 1940, quoted above, prescribed that harvesting with simple machinery (mowers) continue for sixteen hours with the horses working in shifts, but no shifts were mentioned for the men.[23] Gorshkov recommended for fall plowing a working day from four in the morning to eight in the evening, with net work covering twelve hours.[24] He went on to say that work is even more effective with workstock operated in shifts, but he too failed to mention shifts for the men.

The All-Union Science Research Institute for Horse Husbandry recommended for horses, and obviously for the men working with them, a workday from five in the morning to eight in the evening with two interruptions, one of half an hour and another

[21] *Ibid.*, p. 31.

[22] *Idem.*

[23] Repeated in *Problems of Organization of Kolkhoz Production*, State Publishing Office for Agricultural Literature (2d ed., Moscow, 1946), p. 141, again with no mention of shifts for men, but with the difference that *at least* sixteen hours of work were requested.

[24] M. Gorshkov, "Utilization of Workstock in Spring Plowing," *Socialist Agriculture*, September 1941, p. 16.

of three hours.[25] Harvesting with mowers, according to Basyuk, frequently starts at three in the morning and lasts until eight in the evening with net work of thirteen hours.[26] Since Basyuk, in reporting a workday schedule in a kolkhoz dairy starting at four in the morning and ending at midnight, did not fail to mention that two shifts for the personnel were involved,[27] in all other cases mentioned by him it is apparent that the personnel was expected to work in one shift from early in the morning to late at night.

Such long workdays are recommended even for women. No exceptions for children are mentioned. Moreover, the long workdays are planned not only for field operations of relatively short duration, but for year-round work. In describing the work schedule established in the dairy fermy of some progressive kolkhozy, Ragozin mentioned as a model a dairy ferma where the day started at four in the morning and ended at eleven twenty-five in the evening, with two interruptions lasting three hours and twenty-five minutes each.[28] In another dairy ferma the workday was from four thirty in the morning to ten in the evening with two interruptions, one lasting one hour and the other two and one-half hours.[29] The author commented:

> The problem of interruptions in the fermy, i.e., of the time of rest for the livestock, and also for the workers tending that livestock, is very important. It is particularly significant to assure an adequate rest to the high-yielding cows, which are characterized by a considerable nervous excitability.[30]

Most of the work in dairies is women's work. They are not supposed to be nervously excitable, and their need for rest comes only after that of the cows.

The amount of work performed during worktime and the quality of the work are so tied up with the reward of the kolkhozniki that the problems are discussed together in the following sections.

[25] T. L. Basyuk, *Organization of Kolkhoz Production* (Moscow, 1946), p. 166.

[26] *Ibid.*, p. 168.

[27] *Ibid.*, pp. 213–14.

[28] G. Rogozin, "Raising the Productivity of Cows in Progressive Kolkhozy," *Socialist Agriculture*, June 1945, p. 19.

[29] In the dairy ferma quoted as exemplary in *Problems of Organization of Kolkhoz Production*, p. 201, the first milking started at 4:30 A.M. and the last ended at 10:00 P.M.

[30] Rogozin, *op. cit.*, p. 20.

TRUDODEN

"Trudoden" means literally labor day. But the term is used as a unit for crediting the kolkhozniki for their work in the kolkhozy. More than one trudoden is earned per workday on the average.

Background.—In the early post-Revolution years, the whole life was permeated by the principle "from everyone according to his ability, to everyone according to his needs." This principle was particularly welcomed by the peasantry, into whose habits it fitted well. In the young kolkhozy it was reflected in the fact that, where living and eating were not fully collectivized, the proceeds were distributed on various so-called consumers' principles, not on the basis of labor input.

One should not be misled by the facts that, from the very start, proceeds were frequently distributed according to the labor force, and that this principle gradually became the dominant one. A survey of the kolkhozy in 1928 by the Central Statistical Board showed that the kolkhoz proceeds were distributed among the kolkhozniki as follows (in percent): [31]

Basis of distribution	TOZ	Artel	Communes	All
Needs	2.1	6.8	18.6	5.4
Contributions to the capital of the kolkhoz	9.8	13.6	11.2	11.0
Labor force	71.6	80.6	78.2	73.2
Eaters	40.4	43.1	48.8	41.2
Tenure of members	20.7	11.2	2.0	16.3
Livestock of members	7.2	5.6	1.3	5.7
Use of means of production of members	26.0	14.1	5.6	20.4

Thus, distribution according to eaters and needs ranged below that based on the labor force. This did not, however, mean distribution by actual labor input, but rather by the number of workers (mostly men workers) in a household. The application of this principle did not even insure participation in the work, to say nothing of the amount and quality of the work done. Distribution according to labor input was not practiced at all.

[31] N. Demyanov, "To the History of the 'Trudoden'," *Problems of Economics*, June 1940, p. 196. The totals in the tabulation exceed 100 because kolkhozy frequently applied more than one principle of distribution and all principles were recorded without distinguishing between main and secondary ones.

The weakness of the pre-drive kolkhozy was commonly traced —among other things—to the fact that the distribution of the kolkhoz proceeds did not induce the kolkhozniki to perform a large quantity of work of good quality. The survey summarized above was made because it was recognized that serious measures were essential to insure adequate performance. The Fifth Session of the All-Union Council of Kolkhozy in April 1927 believed it desirable to introduce norms for performances, specialization of workers by permanent assignment to specific jobs, and payment of premiums for conscientious attitudes and better work. The All-Union Congress of Agricultural Co-operatives in June 1928 declared: "Under present conditions the system of payment for work on the basis of equalization—consumers' principle (per-eater principle)—presents one of the main handicaps to raising the labor productivity of the members of the collectives." It was therefore decided: "In agricultural communes, arteli, and TOZ, payment for work must be according to the amount and quality of work, with a shift to piece-work desirable." The Artel Charter of 1930 (Article 14) provided: "For the adequate organization of the work of the artel members, norms of performances and of payment for the individual operations are established; amount and quality of work is ascertained; piece-work and the norm-system are applied." This was, however, only a formula; three years passed before it was filled with sufficient substance to start functioning. Brigades, squads, and individual responsibility of the kolkhozniki for assigned jobs, discussed on pp. 334–37, were other developments of the same principle.

Birth of the trudoden.—On June 6, 1930, the Kolkhoz Center USSR ordered: "It is necessary that the work in the kolkhozy be evaluated not in rubles, as it is now, but in trudodni."[32] Thus the trudoden was born. The All-Union Congress of Soviets in March 1931 put the authority of the state behind the trudoden. Its decision was:

> The distribution of the kolkhoz income according to the principle—who works more and better, gets more; who does not work, gets nothing—is to be the rule for all kolkhozniki and kolkhozy. In conformity with this,

[32] Demyanov, *op. cit.*, p. 202.

piece work, estimated in trudodni, is to be applied on a large scale in the basic farm operations—plowing, sowing, weeding, harvesting, and threshing.[33]

Almost two years passed, however, before the Commissariat of Agriculture on February 28, 1933, issued a directive on the use of the trudoden. For many types of work the receipt of trudodni was made contingent upon the fulfillment of the daily norm. A model schedule of such norms was released by the Commissariat simultaneously with its directive.

Scale of trudodni earnings.—According to the 1933 directive of the Commissariat of Agriculture, all performances in the kolkhoz were divided into seven groups.[34] The seventh and highest group was to be paid two trudodni per day, the first and lowest group one-half of a trudoden, the gradations from group to group being one-quarter of a trudoden. The seventh group was to be composed of senior tractor drivers, operators of all complicated harvesting machines such as combines and binders, mechanics on the thresher, sowers into mud (on the latter, see page 493), and chairmen of large kolkhozy. Guards, cleaning women, and messengers were put in the first group.

Since 1934 the pay of tractor drivers has been raised materially.[35] By the order of September 21, 1933, in all work except plowing, the drivers of the International were to get three trudodni per shift, with premiums for exceeding the norm, for saving fuel, and for certain other achievements.[36] The system of payment established for plowing, called progressive, is of particular interest since it demonstrated the vigorous steps by which large daily performances were to be encouraged. The driver of the International was to receive for the first hectare plowed during a shift approximately .5 trudoden; for the second hectare .7 trudoden; for the third, 1.2; and for the fourth, 1.7 trudodni, or more than three times his remuneration for the first hectare. The total for 4 hectares per shift was 4.1 trudodni, and for a first-class driver (there are two classes) .4

[33] *Most Important Decisions on Agriculture*, State Publishing Office of Kolkhoz and Sovkhoz Literature (2d ed., Moscow, 1935), p. 423. [34] *Ibid.*, pp. 440–41.

[35] Operators of combines, mechanics on the threshers and the like soon became employees of the MTS.

[36] *Most Important Decisions on Agriculture*, (2d ed.), pp. 209–10.

trudoden more. The tractor drivers were also given the important guaranty of a minimum of 3 kilograms of food grain and 2½ rubles per trudoden (chapter xii).

The privileged position of the tractor drivers established in 1933 was raised still more as time passed. The rates of payment of tractor drivers and their assistants (hitchmen), brigadiers and their assistants, and fuel controllers, as established on January 1, 1940 and, with certain modifications and one important qualification, still broadly in force, were stated in chapter xii (pp. 284–86).

Of the other developments in the evaluation in trudodni, it is noteworthy that in the late 'thirties the kolkhozy started to buy manure from their members with payment in trudodni. The payment of as much as 4 trudodni for a quintal of poultry manure was reported in a war year.[37] The payment of the kolkhoz chairmen was raised by the order of April 21, 1940. In the eastern areas they were to get 45 to 90 trudodni per month, depending on the cropped plowland of the kolkhozy, plus a monthly cash reward depending on the money receipts of their kolkhozy.

During the war the government ordered the kolkhozy to use for work the cows of those kolkhozniki who were willing to supply them; actually, of course, the peasants had to permit this use. This regulation is still in force. The daily norms for work with cows are one-third of those for work with horses. Most important is the transporting of produce for delivery to the government by the kolkhozniki with their own cows. The prescribed rate of payment is .3 trudoden and up to 135 grams of grain per quintal-kilometer (equivalent to about 5 trudodni and up to 20 kilograms of grain per ton-mile), with double payment if the norm is exceeded. The cows receive kolkhoz feed when so used.[38] At these rates a man with a cow should be able to make 10 trudodni per day in addition to the grain and feed allowance. As much as 15 percent of all trudodni was spent for the use of kolkhoznik cows in the transportation of grain

[37] *Socialist Agriculture*, Mar. 5, 1946.

[38] See, for example, the order of government and Party, "On the 1945 Harvest and Procurements of Farm Products in 1945," *Socialist Agriculture*, July-August 1945, pp. 8–9.

by a kolkhoz cited in an article by Chuvikov, a high official.[39] Little work, of course, was done for that much pay.

The rising rates of payment of tractor drivers and kolkhoz chairmen, and the high evaluation of manure and of the transportation with kolkhoznik cows, in terms of trudodni, afforded strong indications of the depreciation of the value of the trudoden which had occurred before the corresponding regulations were issued. But each of these factors, and especially the rate of payment for transportation with cows, was also a cause of further depreciation in the value of the trudoden. The government, while urging a "full-weighty trudoden," contributed to its further depreciation by ordering these high payments.

PREMIUMS

Piecework, daily norms of performance, premiums for overfulfillment of the norms, and similar inducements can at best insure quantity of work. The chance of obtaining work of good quality was particularly small where even the participation of the kolkhozniki in the work of their kolkhozy had to be compulsory. The premiums for quality of work, when introduced, had therefore a dual function: to raise the quality of the work and to make the kolkhozniki more willing to work for the kolkhoz.

It is difficult to measure quality of work otherwise than by results, and the quality of the kolkhozniki's work is measured in this manner according to regulations on premiums. But in a large organization the results of the work of one person depend on the work of others. Further complicating the use of premiums based on results are the specific conditions of crop production; weather hazards deprive the system of much of its effectiveness (see below, pp. 408–09).

Furthermore, substantial premiums diminish the total resources available for distribution among the kolkhozniki on trudodni, and thus curtail the value of the trudoden even more. The final drawback of the premium system is that it involves extra work brought about by splitting up the fields into tiny lots for separate operation, through extra accounting, and so on.

[39] V. Chuvikov, "Certain Problems of Organization and Payment of Labor in Kolkhozy," *Socialist Agriculture*, July-August 1946, p. 25.

The start.—Premiums for quality of work were apparently introduced in 1935 by the order of the government and Party of March 13, 1935, "On the Plan of Kontraktatsiya and on Measures to Raise the Yield of Sugar Beets." The chairmen of the kolkhozy and the brigadiers of the field brigades were made the principal recipients of cash premiums payable by the sugar factories for delivery in excess of the amounts specified in the contracts between the kolkhozy and the factories. The directors of the MTS and their agronomists were not forgotten. Last came the members of the brigade; they were entitled to an additional 10 percent of all trudodni earned by them on sugar beets, if the brigade had assured 90,000 roots per hectare in conformity with all agro-technical requirements. Soon the practice of premiums was extended to certain other industrial crops, the squads becoming the principal recipients of the premiums.

Premiums in kind.—The order of the government and Party of October 21, 1938 made a start with premiums in kind. The kolkhozniki of the squads of the southwestern areas, working on millet, were to receive 20 percent of the harvest in excess of 10 quintals per hectare. Millet was selected for this beginning because, next to corn, it responds best to weeding and because the weeding of millet must be exclusively or primarily by hand.

A yield of 10 quintals of millet per hectare in the semiarid conditions of the southeast is far above average. However, if moisture is adequate at seeding time (millet is sown late) and the land is reasonably clean, thirty or more days spent on weeding per hectare[40] may occasionally result in a crop of 15 or, under very favorable conditions, 20 quintals per hectare. Allowing ten days for other operations, such a yield would be equivalent to 37.5 to 50 kilograms (1.7 to 2.3 bushels) per workday—a very poor return, particularly in view of the fact that this grain yields little more than 60 percent in milling. However, under the described favorable conditions, the premium may have amounted to 3–7 kilograms of millet per day of weeding. With

[40] One hand weeding requires fifteen to twenty days per hectare. V. Savchenko, "Reserves of One Kolkhoz," *Socialist Agriculture*, June 1940, p. 112, reported a norm for weeding of millet of 0.05 hectare per day. From Kiev oblast, four hand hoeings of millet were reported in *Socialist Agriculture, Mar. 31, 1947, while two to three are considered standard* now.

the reward per trudoden as small as it normally was, and trudodni earned for the time in weeding anyway, everyone wanted to have a share in the fortune. Yakushkin reported: "All brigades and squads are so eager to have millet, because of the premiums in kind, that undesirable parcellation of fields occurs, and the work plans for millet are exceeded at the expense of other crops."[41]

The full line.—The answer to this general desire to work on millet was found in the decision to extend the premium system to all other crops and to all animal products. The respective order of the government and Party of December 31, 1940 stated:

> The equal value of the trudoden (regardless of the harvest results obtained by the brigade and squad) constitutes a serious handicap upon the further increase of labor productivity in the kolkhozy and upon the increase in the financial interest of the kolkhozniki in raising the yields of crops and the productivity of livestock.

The new order applied only to the Ukraine, but it was soon extended to other areas. The same was true of the earlier order on the premiums on millet, which had first applied directly only to the southeast.

Most of the newly introduced premiums were in kind, but some were in cash or trudodni. While the premium on millet introduced in 1938 was for a yield far in excess of the local average, under the new regulation premiums were to be paid for any excess over the planned yield and planned livestock productivity, which ordinarily are only slightly or moderately above those attained under normal conditions.

The receipt of premiums is conditioned upon earning the minimum number of trudodni established by law. So far as possible, the premium was to reach the individual. In the cases of technical and non-grain row crops, the recipient was the squad; in the cases of animal products, usually the individual. Thus a milkmaid was to get 15 percent of the excess milk from the cows assigned to her, the herdsman 5 percent of the excess milk of cows tended by him, and so on. Later, the squad was frequently made the recipient of premiums for non-row crops

[41] M. Yanyushkin, "Squad Organization of Labor in Kolkhoz Brigades," *Socialist Agriculture*, March 1940, pp. 61–62.

(grain and other), while individuals began to receive the premiums on row crops. Brigadiers, managers of livestock fermy, agronomists, and chairmen of the kolkhozy were also to receive premiums. Recently the tractor crews, including the brigadiers of tractor brigades and their assistants, were added as recipients of premiums for exceeding the planned yields and livestock productivity.

About 40 percent of the grain (other than winter wheat and buckwheat) in excess of the planned yield may be disbursed as premiums. Of potatoes, sunflower seed and most other oilseeds, fruits and vegetables, flax, and hemp, the proportion so disposed may amount to almost 50 percent, and of winter wheat, buckwheat, and dry legumes, to about 65 percent. The premiums may be still larger on certain crops for which they are payable in money (cotton, sugar beets, all kinds of seeds, etc.),[42] their high level being made possible by the low basic prices and the large premiums paid by the state to the kolkhozy for these commodities (see pp. 381–83). The proportion of excess animal production which may be distributed as premiums is also large. For example, the workers tending the suckling piglets are supposed to receive each fifth piglet raised above the plan to an age of two months. Those assigned to finishing hogs may get 15 percent of the weight over the plan. Premiums for piglets and hogs are also to go to the brigadier and manager of the ferma. Particularly large premiums are recommended for sheep raising in Kazakhstan.[43]

Especially since yields in excess of plan are obtained largely as the result of favorable weather, the use of a large portion of the excess crops for premiums would make heavy inroads upon the incomes of the kolkhozy and, in the final analysis, upon the value of the trudoden—the proclaimed tie between the kolkhozniki and the kolkhoz. The kolkhozniki would have no prospect of getting premiums in poor-weather years. Thus the premium system would be ineffective at the very time when it may be all-important to save as much as possible of the harvest. Since the premiums function mainly in good years, the incomes of the

[42] For details see Basyuk, *op. cit.*, pp. 251–55.

[43] *Ibid.*, pp 259–65.

kolkhoz peasants have become more than ever subject to violent year-to-year variations. In good crop years the value of the trudoden is relatively high and premiums may be earned. In poor crop years the value of the trudoden is low and there may be no premiums in crop growing whatsoever.

As it appears to the present writer, the premium system is unlikely to bring about a fundamental improvement. Yet it was and is proclaimed a great success. The official spokesman on this subject wrote:

> Already, in the first year of existence of the law [1941], the premium system has been widely accepted. In 1941, although a considerable part of the kolkhozniki are mobilized in the armed forces, premiums were paid in one-quarter of the kolkhozy.[44]

The actual results were much less imposing; the percentage of kolkhozy paying premiums was not large and those that paid, for the most part did so on only a small portion of their output. Chuvikov concluded:

> In 1942 all kolkhozy are to apply the law regarding premiums for the kolkhozniki, which is a powerful means of raising the productivity of kolkhoz labor. For this it is necessary that the squads and brigades be firmly organized, that the work of each kolkhoznik be strictly counted, and that the harvest of the brigades and squads be ascertained separately.[45]

Imagine this amount of red tape under war conditions!

The great depreciation in the value of the trudoden in the war years should have stimulated the premium system, since the premiums were mostly payable in kind. Little progress was made, however, probably because the goals for crop yields and livestock were not reduced in proportion to the decline—inevitable under war conditions—in actual yields and productivity. According to Chuvikov, 21 percent of all kolkhozy paid premiums in 1944, but only 14.8 percent paid them on products of animal husbandry and 7.8 percent on crops; and in general the premiums were paid only on certain animal products and certain crops.[46] In a later article, Chuvikov gave the number

[44] V. Chuvikov, "On Premiums for Work of the Kolkhozniki," *Socialist Agriculture*, June-July 1942, p. 20.

[45] *Ibid.*, p. 21. Chuvikov's article was not available to the readers before the second half of August 1942.

[46] V. Chuvikov, in *Socialist Agriculture*, September 1945, pp. 17–18.

of kolkhozniki who received premiums in 1944 as 1,234,000, or not much more than 3 percent of the total.[47]

Nevertheless, the premium system is scheduled to play a great role in restoring agricultural productivity after the war, according to the 4th Plan. The February 1947 resolution of the Party took the same stand:

> Considering it intolerable that the law on the additional payments is not yet carried through in all kolkhozy, as well as that in many cases the additional payments due for exceeding of the goals in crop yields or livestock productivity are paid to the kolkhozniki belatedly—to establish a rigid control over the timely disbursement of the additional payments due to the kolkhozniki.

TRUDODNI STATISTICS

The labor input of the kolkhozniki in their kolkhozy around 1938 in terms of workdays was covered above (pp. 392 ff.). Together with the analysis of the distributions to members by the kolkhozy, those data permit the computation of the reward per workday around 1938 (see pp. 693–94). Unfortunately, little is known of the labor input in kolkhozy in terms of workdays before 1937 and nothing is known of it for the years since the Union entered the war. This necessitates the use of the much more complete trudodni statistics.

The huge number of 8 billion trudodni was earned in 1938, according to official data compiled in Table 28. A workday averaged 1.28 trudodni in the 430 kolkhozy surveyed in 1937. For the various age groups the equivalents were:[48]

Adults 16–59	1.31
Men	1.36
Women	1.23
Adults 60 and over	1.11
Men	1.12
Women	1.05
Children	1.00

Data for the Ukraine indicate an equivalent of 1.357 trudodni per workday, either of all adults (16 years and over) or only those under 60 years in 1938.[49]

[47] V. Chuvikov, in *Socialist Agriculture*, July-August 1946, p. 27.

[48] *Productivity and Utilization of Labor in Kolkhozy . . . . .*, p. 126.

[49] Stetsenko, *op. cit.*, pp. 30–31.

The total number of trudodni credited in all kolkhozy more than doubled from 1932 to 1937 (Table 28). The relatively small increase in 1938 was the result of the poor harvest. Moreover, this increase was larger than that from 1935 to 1936—another case of a poor crop following a good one. This is particularly significant since 1937 was a much better year than 1935. The total number of trudodni continued to rise in 1939 and more strongly in 1940.

TABLE 28.—PERTINENT TRUDODNI STATISTICS, 1932–39*

Year	Able-bodied kolkhozniki[a] (*million*)	Number of trudodni		
		Total (*million*)	Per able-bodied worker[b]	Per household
1932.....	32.14	3,793	118	257
1933.....	33.07	4,898	148	315
1934.....	35.21	5,837	166	354
1935.....	37.84	6,861	181	378
1936.....	40.22	6,996	174	393
1937.....	40.72	7,893	194	438
1938.....	.....	8,005	195[c]	437
1939.....	.....	.....	207[c]	448

* Data for 1932–37 from *Kolkhozy in the 2d Stalin Five-Year Period*, pp. 35, 36, and 40. Data for 1938 from A. Arina, "Kolkhozy in 1938," *Socialist Agriculture*, December 1939, p. 62. Data for 1939 from D. Shepilov, *Socialist Kolkhoz Property* (Moscow, 1940), pp. 75 and 80.

[a] Strictly, able-bodied kolkhozniki participating in kolkhoz work. Comparison of the figure for 1937 given here with data for the same year from other sources indicates that this series includes children twelve to below sixteen years old working for the kolkhozy.

[b] For 1932–37, apparently per person as described in note *a*.

[c] The figures given in the sources for 1938 and 1939 are 221 and 233 respectively; Arina's is defined as pertaining to able-bodied persons over sixteen, and Shepilov's is apparently the same. Since the 1932–37 data are assumed to include children, the 1938 and 1939 figures were adjusted by applying the relationship between the average for all workers and that for workers over sixteen, as disclosed by the 1937 survey. There still may be an error, since the 1937 survey speaks of "able-bodied persons participating in kolkhoz work," whereas Arina does not make this qualification.

The large increase in the total number of trudodni in 1932–37 was due more largely to the increase in the number of trudodni earned per year per person engaged in the kolkhoz work, which amounted to 64.4 percent from 1932 to 1937, than to the increase in the number of such persons, which amounted to 26.7 percent. The rise in the number of trudodni per person resulted from increases in both the number of days worked per

year and the average number of trudodni per workday. No reliable data are available on these factors separately.[50]

The increase in the average number of trudodni per workday in the 'thirties was partially due to the rise in the payment of tractor drivers and the number of days worked by them, to premiums in trudodni, and to other swelling of the number of credited trudodni. There was probably a residual rise which would be attributable to increased labor intensity.

Table 28 indicates an increase in the number of trudodni per household from 1932 to 1937 by 70.4 percent as against an increase of 64.4 percent per person engaged in kolkhoz work. This difference of 3.7 percent in favor of the households fits well with the assumption in Appendix Note A, that the number of persons per household increased from 4.22 in 1933 to 4.38 in 1939, i.e., by exactly 3.7 percent. Of course, the latter figure pertains to all household members and the former only to those engaged in kolkhoz work.

Annual trudodni payments per able-bodied person per year continued to rise during the war. Chuvikov gave the following data:[51]

Year	Men	Women
1940	312	193
1941	323	188
1942	327	237
1943	338	244
1944	344	252

The increase for all workers was stated in another source as 18 percent from 1940 to 1942.[52] By 1944 it may have reached approximately 25 percent.

The substantial increase in the number of trudodni earned per person in 1940–44 points to the strong probability that the total number of earned trudodni remained unchanged in those

[50] B. Babynin ("Labor Resources of the Kolkhozy and Their Utilization," *Problems of Economics*, February 1940, p. 68) quoted an official survey in 9 oblasti, according to which the number of trudodni per workday rose as follows: 1933, 0.95; 1934, 1.01; 1935, 1.06; 1936, 1.15, and 1937, 1.25. These figures indicate a rise in the average number of trudodni per workday in the kolkhozy investigated by 31.6 percent. Since, according to the data in Table 28, the total amount of trudodni per *worker* in all USSR increased in those years by only the same percentage, Babynin's data obviously are not representative.

[51] V. Chuvikov in *Socialist Agriculture*, July-August 1946, p. 21. Data for a comparable territory not affected by the war.

[52] *Moscow Bolshevik*, Oct. 29, 1944.

years, or may even have increased slightly,[53] the increase in trudodni per person at least compensating for the decline in the total number of persons working for the kolkhozy.

The large number of trudodni and workdays vis-à-vis a modest kolkhoz output obviously implies a small output per trudoden and workday.

TRUDODNI AND WORKDAYS RELATED TO OUTPUT

The volume of agricultural production for sale and for consumption in the farm home is estimated at 12.2 and 11.5 billion 1926/27 rubles in 1937 and 1938 respectively (p. 676). The computation for 1938 is made for normal weather conditions. The average actual volume of output in 1937 and 1938 was around 11.5 billion rubles.

The kolkhoz output was about 65 percent of the total (page 358), or around 7.5 billion rubles. Since 7,949 million trudodni were earned on the average of those two years (Table 28), the output per trudoden amounted to only 95 kopeks. Assuming for adult workers a relation of 1⅓ trudoden to a workday, the kolkhoz output per workday was equivalent to only 1.25 rubles at 1926/27 prices, i.e., measurably less than the net income of the individual peasants per workday before collectivization, roughly computed at 1.35 rubles (see page 694). Yet from the 1.25 rubles depreciation charges and the cost of non-agricultural material have to be deducted to arrive at the net income from kolkhoz output per workday. To compute the reward of the kolkhozniki, per workday, the big share of the state in the kolkhoz output also has to be subtracted (see pp. 700–701).

The total volume available for sale and consumption in the farm home increased from 1932 to 1938—normal weather conditions assumed—by approximately 44 percent (see page

[53] The only data on the total number of trudodni for war and postwar years which have come to the attention of the writer are those for six oblasti or republics given by V. Abramov and I. Ermolinsky, "On the Administrative Apparatus in Kolkhozy," *Socialist Agriculture*, February 1947, p. 22. They are as follows (1945 in percent of 1940):

Sverdlov	104.0	Chuvash	95.5
Vologda	100.7	Uzbek	86.4
Kazakh	100.4	Mordovsk	75.9

But these oblasti and republics are probably those in which the proportion of the trudodni used on administration increased most (this was the problem that especially interested the authors of the article cited). The data may not be representative with respect to changes in total number of trudodni.

676). The output of kolkhozy, on the same assumption, rose by 65–70 percent.[54] Since the total number of trudodni increased by over 100 percent the output per trudoden declined by about 20 percent from 1932 to 1938. The greater increase in the number of trudodni than in total output was partly due to such phenomena as the rapid increase in work of tractors, and consequently of the high payments of tractor drivers, and payment for the kolkhozniki's manure in trudodni.[55] The principal reason, however, for the large increase in the total number of trudodni in spite of additional labor savings through mechanization, was greatly increased labor inputs in operations performed by hand, such as cultivation, weeding, topping, and gleaning. Also, the kolkhoz animal husbandry, in which the kolkhozy are particularly inefficient, increased more rapidly than total kolkhoz output.[56]

There was a huge further decline in the output per trudoden during the war, amounting to 30 percent or possibly more. In view of the great fall in cotton output, that percentage may apply even to Uzbek, where the total number of trudodni went down by 13.6 percent from 1940 to 1945 (see footnote 53).

[54] Official data indicate an increase in gross agricultural production of the kolkhozy from 1932 to 1937 by almost 90 percent (see tabulation in chapter xv, p. 358). For the period 1932 to 1938 (normal weather assumed) it would have been about 75–80 percent. But the 1937 and 1938 grain output was overestimated much more than that of 1932 and there were other overestimations in the computation of the 1937 production.

[55] With these exceptions, the same kind of work apparently was paid approximately the same amount of trudodni over the whole prewar period, the increase in the number of trudodni per workday in some operations having been accompanied by approximately the same increase in daily performances. Evidence on this point, however, is not uniform.

[56] The tabulation on p. 358 shows about the same increase in the value of the animal production as that of total agricultural output. But the overestimations in the later year involved primarily crop production.

CHAPTER XVIII

MAN POWER: PRODUCTIVITY

Very great savings of labor are officially claimed as the result of mechanization of agriculture and plant enlargement. Shepilov wrote in 1939: "Everyday experience shows that in the artel the labor of the large-scale mechanized economy is at least five times as productive, yields five times as much produce, as the same labor in a tiny lot of near-dwelling land."[1]

On this point, *Socialist Agriculture USSR, 1938* contains two tables that have been reproduced over and over again in Soviet literature and speeches. Table 54 gives the labor input in the principal operations performed by large crawlers, wheel tractors, and horse and hand labor in the kolkhozy in 1937 and by individual peasants in 1922–23 to 1924–25. The largest saving is naturally claimed for the combine. According to the table, individual peasants in the earlier period used forty-three times as much labor as was spent in harvesting with crawler-pulled combines in 1937. Table 55 of the same publication presents the computed saving of labor in all operations performed with tractors by the MTS in 1937, as compared with the same operations as they were performed in the kolkhozy by horses and hand labor in the same year, and as they had been performed by individual peasants in 1922–23 to 1924–25. The latter comparison points to a saving of 10.9 million man-years (see Table 29). These and similar assertions are gladly taken at face value.

Although the Soviet claim of having the most mechanized agriculture in the world is a big overstatement (see pp. 455–56), a great deal of mechanization was accomplished. Large savings of labor could be expected to follow this development as well as that of consolidating in large enterprises over 90 percent of all agricultural land and a substantial proportion of the

[1] D. Shepilov, *The Social and Private in Kolkhozy* (Moscow, 1939), p. 68.

productive livestock. However, even superficial analysis shows that the actual savings have not been at all commensurate with these changes. Moreover, on a worker-year basis, they are so moderate that they could have been reached without the fundamental changes in land tenure and farm organization and with only a fraction of the actual mechanization and new investment. Labor productivity per work hour apparently did not increase at all, and may even have declined.

TABLE 29.—OFFICIAL COMPUTATION OF LABOR SAVINGS IN KOLKHOZY THROUGH THE USE OF TRACTORS AND COMBINES OF THE MTS IN 1937*

Labor input and savings	Million workdays	Million work years
Labor input		
A. Actual, in tractor work of the MTS, 1937	220.8	1.9
B. Estimated, if the same operations were performed by horses and hand labor	1,070.6	9.1
C. Estimated, if the same operations were performed by individual peasants	1,505.8	12.8
Labor savings		
A as compared with *B*	849.8	7.2
A as compared with *C*	1,285.0	10.9

* *Socialist Agriculture USSR, 1938*, Gosplan (Moscow, 1939), p. 50. See comments on this and the preceding pages.

The official computations of the savings of labor attained, specifically the one reproduced in Table 29, give an erroneous picture. Only the favorable portion of the kolkhoz activities is considered in them and, even with reference to that favorable portion, the huge auxiliary labor forces used in the kolkhozy with the new machinery are simply ignored.[2] The conversion

[2] The figures themselves reveal the fact that the auxiliary labor was not considered in the computations shown in the two tables in *Socialist Agriculture USSR, 1938* mentioned above, of which the second one is reproduced here as Table 29. Moreover, both tables are part of a study reported in detail by I. Merinov ("Labor Productivity in Kolkhozy," *Socialist Agriculture*, July 1939, pp. 7–19). The table given as Table 54 in *Socialist Agriculture USSR, 1938* has a footnote in Merinov's study, stating that the auxiliary labor was not included in computing the labor input in combining. The footnote does not appear in *Socialist Agriculture USSR, 1938* or in other official publications reproducing Merinov's tables. As combining is done in the USSR, the auxiliary labor is several times as great as the direct labor. It is the writer's assumption that the auxiliary labor was also omitted in the computations of labor input in other operations considered in the tables involved.

of workdays to years at the rate of 116 days to a year also is questionable.

The conclusions here reached with reference to the savings of labor attained in Soviet agriculture—quite unexpected in view of the official claims—are substantiated by a considerable amount of evidence in a later portion of this chapter. But they may also be easily arrived at by a simple, over-all computation.

From 1928 to 1938 the volume of agricultural output available for sale and for consumption in the farm home increased by 15 percent (see page 676). The number of persons gainfully employed in agriculture declined by about 10 percent over the same period (see pages 713–14). Hence the yearly output per gainfully employed person rose by not quite 30 percent. This is, however, only the first step.

Mechanization implies partial substitution of industrial labor for farm labor. The work of raising the released draft animals and growing feed for them has been eliminated, or additional amounts of animal products are produced with that labor and feed and are reflected in the volume available for sale and for consumption in the farm home. Even if the difference between the amounts of labor needed for the care of tractors and of working horses is ignored, and only the value of the feed for draft animals released by mechanization is deducted from the 1938 volume available for sale and for consumption in the farm home, the increase in the yearly output per gainfully employed person in the decade 1928–38 is reduced to less than 20 percent, perhaps to no more than 15 percent.

There is one more factor to consider. Official Soviet speakers take great pride in the fact that the peasant's labor year is now much better filled with work than it was before collectivization. Every study of labor utilization in agriculture emphasizes that, thanks to socialization, agriculture has lost part of its seasonal nature. "Collectivization of the peasant economy created the conditions for overcoming the seasonality of agricultural work," wrote Libkind.[3] He insisted, indeed, that "the utilization of labor

[3] A. Libkind, "Problems of Rational Utilization of the Labor Resources in Kolkhozy," *Problems of Economics*, February 1939, p. 88. See also I. Laptev (a highly official writer), "The Victories of the Kolkhoz System," *Socialist Agriculture*, November 1939, p. 21, *Kolkhozy in the 2d Stalin Five-Year Period* (Moscow, 1939), p. x, and others.

in kolkhozy is incomparably greater than it was in individual peasant farming."[4] Other official spokesmen seconded him. In the enthusiasm over this achievement, the fact is ignored that with a given amount of output an "incomparable" increase in the annual utilization of labor implies a corresponding cut in the output per hour.

An exact comparison of the labor input per able-bodied person before and after collectivization is unfortunately impossible. On the pre-collectivization utilization, Studenskii reported:[5] "According to the plan for agriculture [tentative plan of the Gosplan for 1926–27 to 1930–31] 137 days per year, i.e., hardly half of the yearly supply of labor, is used in 1925–26." But Studenskii himself believed that the above figure was a substantial exaggeration. In support of this contention he presented a summary of data on the input of labor per worker in peasant households before World War I as follows (in days):[6]

Kostroma guberniya	87.2	Vologda raion	91.5
Smolensk guberniya	84.3	Kadminsk raion	89.8
Tambov guberniya	75.1	Moscow raion	53.5
Volokolamsk raion	103.2	Starobelskii raion	86.3
Surazh raion	125.4		

Libkind likewise did not use the figure for labor input given in the tentative plan for the pre-collectivization period. Instead he used data of the Central Statistical Office for 1924–25 in man-days, recalculated in terms of able-bodied persons.[7] These he compared with the labor input per such person in the kolkhozy in 1937, computed from annual kolkhoz reports. The result of the comparison is shown in the tabulation on the opposite page.[8] To the work in the kolkhozy in 1937, Libkind added half of the time used by the kolkhozniki on their own enterprises, and reached the conclusion that the working time of the gainfully

[4] Libkind, *op. cit.*, p. 79.

[5] G. Studenskii, "Agriculture of USSR in the Tentative Five-Year Plan," *Ways of Agriculture*, May 1927, p. 50.

[6] *Ibid.*, pp. 50–51. Studenskii cited as his authority Kostrov, Nikitin, and Emme, *Essays on Organization of the Peasant Economy* (1926), pp. 113 and 141.

[7] Before collectivization the computations of the labor input in agriculture normally were in man-units, but this refinement was later abandoned.

[8] Libkind, *op. cit.*, pp. 77–78.

Republic, oblast, or krai	Man-days: Individual peasants, 1924–25	Man-days: Kolkhozy, 1937
Vologda	105.1	196.7
Leningrad	100.7	220.0
Smolensk	112.9	206.7
Kursk	90.9	185.8
Chelyabinsk	84.8	250.9
Orenburg	79.0	205.0
Krasnodar	108.5	245.9
Omsk	86.2	245.9
White Russia	115.4	188.3
Odessa	49.0	177.5
Average	92.0	185.0

employed person had increased in all Soviet agriculture from 92 to 213 days a year, i.e., more than twice.

While the objections of Studenskii to the figure of the tentative plan for the pre-collectivization labor input seem to some extent justified, the figure is applied here for adult persons sixteen to fifty-nine years of age. The average number of workdays in agriculture per such person in 1938 may be assumed to have been roughly 200.[9] Hence the workdays per person had increased by over 45 percent since before collectivization.

The workday in the kolkhozy is shorter than it was before collectivization. However, a certain allowance for this shortening is made by counting 200 days per person per year in 1938. A rather substantial increase in the utilization of labor resources in terms of work hours per person per year seems indeed certain. Most of the millions of very small peasant households not only ate poorly and in general lived poorly before collectivization, but possessed too little land and livestock to permit even a reasonably full use of their total man power. Opportunities for outside work were not everywhere available and, even more, not at all seasons. The stronger peasant households

[9] In 1939, according to Merinov (Table 27, p. 393, kolkhozniki sixteen to less than sixty years of age put in 206 days per worker in kolkhozy, MTS, and their own enterprises as well as 22 days for state and co-operative organizations, probably mostly state farms. An allowance must be made for duplication; a large part of the work of the kolkhozniki on their own enterprises was done on the same days that full-day work was performed for the kolkhozy. The number of workdays per worker may also have been somewhat smaller in 1938 than in 1939.

were able to utilize their labor force much more fully than the average household (see next section). The great enlargement of the farms attained under collectivization naturally had similar results after industrialization had absorbed the surplus rural population and means were developed to compel the kolkhozniki to work for the negligible reward they got.

Thus a rise in output per worker per year by not quite 20 percent and a shortening of the workday by an indeterminable amount must be considered in relation to an increase in the number of workdays per person by over 45 percent. It is impossible to say which outweighs the other; but a more than negligible increase in output per hour is definitely excluded, and a slight decline is equally possible.

LABOR PRODUCTIVITY BEFORE COLLECTIVIZATION

The low labor productivity of the Russian peasantry is evident from the discussion in chapters vii–x. It is relevant, however, to point out that the mass of peasantry, though made considerably less unequal by the Revolution, still displayed substantial variations in labor productivity and that material progress could be made by curtailing the least efficient groups. A survey of peasant farming in six agricultural areas, unfortunately made somewhat too soon after the end of the Civil War, in 1922–23, throws some light on the subject.[10]

The peasant households investigated were subdivided into five to six groups by income per full-man worker, woman and child workers having been converted to man workers. The lowest income group comprised households earning no more than 30 rubles per full-man worker per year.[11] The households of the highest income group consisted of those earning over 150 rubles per full-man worker per year. They were by no means millionaires; the small average cropped plowland per household in

[10] L. N. Litoshenko, "Peasant Economy and Its Incomes According to Survey Data," *Agriculture on the Path to Recovery*, edited by L. Kritsman, P. Popov, and Y. Yakovlev, Committee of the Soviet Peoples Commissars USSR for Studying the Contemporary Village (Moscow, 1925), pp. 51–146.

[11] The concept of income or earnings used by Litoshenko was that developed by the well-known Russian agricultural economist, A. N. Chelintzev, and called "arbitrary income." It comprises the part of the gross return of the farm which remains for support of the family, increase in investment, savings, and taxes.

this income group (Table 30) clearly shows that strictly peasants were involved. Only the data for the lowest and highest groups, and the weighted averages, are presented in Tables 30 and 31.

TABLE 30.—LABOR INPUT IN SURVEYED PEASANT HOUSEHOLDS, SPECIFIED REGIONS, 1922–23, BY INCOME GROUPS*

Household income group	Central Industrial	White Russia	Central Agricultural	Ural	Volga	North Ukraine east of Dnepr
	Cropped Plowland per Household (*desyatiny*)					
Average	2.73	4.19	4.64	4.13	7.81	4.33
Lowest	1.75	2.83	3.07	1.87	6.09	2.81
Highest	6.50	8.53	7.84	6.33	8.53	5.75
	Labor Input per Desyatina of Cropped Plowland (*man-days*)					
Average	54.6	46.3	32.1	29.3	23.0	33.4
Lowest	72.8	60.2	26.2	40.6	17.5	40.3
Highest	28.0	29.9	25.4	21.3	22.7	24.9
	Labor Input of Lowest and Highest Income Groups as Percent of Average					
Lowest	133.3	130.0	81.6	138.6	76.1	120.7
Highest	51.3	64.6	79.1	72.7	98.7	74.6

* *Agriculture on the Path to Recovery*, pp. 129–30 and 135–37. The lowest-income group was comprised of households with an income from agriculture per full man worker per year of not over 30 rubles. The highest-income group consisted of those with over 150 rubles of such income. Working women and children were converted to man workers.

According to Table 30, the difference in labor input per desyatina of cropped plowland between the highest and lowest groups varied greatly from region to region. Defects in sampling and variations in the proportion of crops with large labor inputs were the principal reasons. But on the average the highest income groups used considerably less labor per desyatina than the lowest groups. In addition, their relatively considerable means of production permitted them to put in many more workdays per worker per year. Table 31 shows that the farm population of the investigated regions would have been almost 15 million larger had all households belonged to the lowest income groups. It would have been little more than one-half as large

as it was if all households had belonged to the highest group, who were by no means rich or equipped with refined means of production. In the enumerated regions with an actual farm population of around 50 million, the raising of all households to the level of the highest group would have released almost 25 million persons.

TABLE 31.—ACTUAL AND HYPOTHETICAL FARM POPULATION IN SPECIFIED REGIONS, UNDER VARIOUS LEVELS OF LABOR PRODUCTIVITY, 1922–23*

(*Thousands*)

Region	Actual population	Hypothetical population*	
		A	B
Central Industrial	10,849	15,362	4,262
White Russia	3,478	3,316	822
Central Agricultural	15,433	21,222	10,043
Ural	5,238	8,120	2,169
Volga	7,169	6,615	4,697
North Ukraine east of the Dnepr.	7,051	8,706	3,647
Total	49,218	63,341	25,640

* *Agriculture on the Path to Recovery*, pp. 144–45.

* In case all population belonged (A) to lowest income group, (B) to highest income group. See note to Table 30 for definition of groups.

That the surplus agricultural population was almost exactly one-half (49.5 percent) of the total was also computed by Lubny-Gertsyk.[12] His analysis was based on the assumption that a full worker (worker in terms of adult man) could handle 5 hectares of agricultural land under peasant-farming conditions. While the analysis was made for 13 oblasti of Central Russia, the results are broadly applicable to the entire country.

The Gosplan USSR estimated the number of surplus able-bodied persons in rural areas in 1926–27 at about 8 million.[13] The computation was obviously made without the assumption of the rather fundamental changes implied in the two computations previously discussed.

It is obvious from the foregoing computations that one might reasonably have expected collectivization, accompanied by mechanization and a great deal of plant enlargement, and with-

[12] L. Lubny-Gertsyk, "On the Surplus Population in Agriculture of USSR," *Agriculture on the Path to Recovery*, p. 352.

[13] Libkind, *op. cit.*, p. 75.

out working any miracles, to release a large proportion of the farm population and give rise to a problem of efficiently utilizing the man power released, rather than one of combating acute labor shortage.

KOLKHOZY

The principal official study on the utilization of labor in the kolkhozy is that for 1937.[14] It is based on reports for all kolkhozy and on a special survey covering 430 kolkhozy in 10 oblasti and krai. The analysis based on the reports was limited to trudodni; the survey considered both trudodni and workdays. Days of men, women, and children were added in the totals without reducing them to a uniform basis.

The utilization of the workdays by items in the kolkhozy surveyed is shown in Table 32. Only negligibly more than one-half

TABLE 32.—LABOR INPUT IN INVESTIGATED KOLKHOZY BY ITEMS AND EQUIVALENTS OF WORKDAYS IN TRUDODNI, 1937*

Item	Percent of total workdays			Average earnings per workday (*trudodni*)		
	All workers	Men 16–59[a]	Women 16–59[a]	All workers	Men 16–59[a]	Women 16–59[a]
Arable land and meadows	47.8	39.6	59.3	1.40	1.43	1.32
Gardens	3.3	1.7	5.4	1.15	1.26	1.14
Orchards	.9	.8	.9	1.20	1.31	1.21
Productive livestock	15.9	13.2	19.7	1.19	1.28	1.13
Work stock	8.1	13.6	1.2	1.29	1.34	.92
Construction	1.6	2.4	.3	1.45	1.56	1.26
Subsidiary enterprises	2.7	4.5	.2	1.36	1.44	1.15
Cultural services	3.1	1.3	5.6	1.01	.98	.97
Obligations to the state[b]	.5	.7	.2	1.04	1.07	.94
Administration	8.3	12.2	2.6	1.17	1.27	.93
Help to kolkhozniki	.2	.2	...	1.34	1.43	1.08
Other work in kolkhozy	6.4	8.1	3.8	1.22	1.30	1.04
Outside work for kolkhozy	1.2	1.7	.5	1.44	1.51	1.25
Total or average	100.0	100.0	99.7	1.30	1.36	1.23

* *Productivity and Utilization of Labor in Kolkhozy* . . . . , pp. 97, 110, and 123.
[a] Other than tractor drivers.
[b] Mostly road repairing.

[14] See the two publications of the Central Statistical Office of the Gosplan, *Productivity and Utilization of Labor in Kolkhozy in the 2d Five-Year Period* (Moscow and Leningrad, 1939) and *Kolkhozy in the 2d Stalin Five-Year Period* (Moscow and Leningrad, 1939).

of the total workdays were used for crop production. Although the kolkhoz livestock herds were small, care of the animals took almost half as much time as crop production. The table shows 8.3 percent of all worktime used for administration, but the proportion was actually much larger. A brigadier of a field brigade, whose work is charged to field operations, has only supervisory functions. A manager of a kolkhoz dairy with twenty or more cows does no manual work.[15] Each kolkhoz with more than twenty mares is supposed to have a special person in charge of horse husbandry, with only managerial functions. The guards are included with the workers of the specific enterprises to which they are assigned; and the guards on collective farms number certainly hundreds of thousands, possibly more than a million.[16]

The survey of the operations of 430 kolkhozy covered in great detail the labor input on several crops and the most important kinds of livestock. Only labor directly utilized on the specific enterprises was charged to them. Neither the time used for administration of the kolkhozy, nor the time used for the care of workstock, was assessed to individual enterprises. Also disregarded was the time of the MTS personnel, although the labor other than that supplied by the kolkhozy had to be included. Yet the findings of the survey disclosed large inputs of labor on small grains, still larger inputs on technical crops, and unbelievably large inputs on animal husbandry.

The labor inputs in the kolkhozy investigated in 1937 for certain crops and one livestock enterprise (cows) were officially compared with the inputs in kolkhozy in 1933 and with those of the individual peasants in 1922–23 to 1924–25 (crops) or 1925–26 (cows). The results of one of these comparisons—

[15] P. Shkobin, "Labor Organization in Kolkhoz Commercial Dairy Fermy," *Socialist Reconstruction of Agriculture*, September 1938, pp. 44–45.

[16] No summarized data are available. An order of the Commissariat of Agriculture, dated June 21, 1933, prescribed guards for crops in the fields during sowing, threshing, and carting. In Protochnaya MTS, Krasnodar oblast, the personnel of each tractor brigade, consisting of 3 to 4 tractors, included a guard (*Socialist Agriculture*, November 1939, p. 41). At this rate over 100,000 guards were needed merely for guarding the machinery of the MTS. In a study of kolkhoz poultry fermy (V. A. Dyakov, "Organization of Poultry Fermy in Kolkhozy," *Socialist Agriculture*, August-September 1940, p. 92), the author enumerated the personnel of two such fermy, one comprising 2,756 chickens and about 5,000 chicks, the other 1,400 chickens and 5,000 chicks; in each case a guard was included. Guards are also provided in all other types of livestock fermy, at warehouses, and so on.

in the four small grains—were reproduced almost endlessly in the USSR. All the comparisons have one feature in common: "oversights" on the part of the compilers.

Individual crops.—The official findings for the four grains—wheat, rye, barley, and oats—also referred to as "early" grains, are summarized as follows:[17]

Basis of comparison	Kilograms per worker per day	Relative figures
Peasant farming, 1922–24[a]	31.1	100
Kolkhozy, 1933	57.8	186
Kolkhozy, 1937	98.0	315

[a] The source said 1922–25.

While the data did not cover corn, millet, buckwheat, and dry legumes, they were commonly treated as if they pertained to all grains.[18] But this was only a minor defect. In arriving at the results tabulated above, the facts were ignored that 1937 was an abnormally good crop year, and that the 1933 and 1937 crops were expressed in "biological" terms, while on the other hand the years 1922–24 were too close to the end of the Civil War to represent a fair average for the pre-collectivization status, and the biological yield had not yet been invented.

On the somewhat more reliable acreage basis, the official computation indicates a labor saving by the kolkhozy in the production of the early grains of about 50 percent in 1937 as compared with individual peasants in 1922–24 (Table 33). But "oversights" occurred even in the handling of the acreage data. It was not forgotten that the computation for 1922–24 had been made per full-man worker[19] while that of 1937 was per worker; the 1922–24 figures were raised accordingly. But it was forgotten that the data for 1937 covered only the direct labor on the specific crops—that not only general administration but even the labor used for the care of the workstock had not been included. The daily norms of the individual peasants in 1922–23 to 1924–25, on the other hand, were most likely computed

[17] *Socialist Agriculture USSR, 1938*, p. 47.

[18] See, for example, *Productivity and Utilization of Labor in Kolkhozy . . . . .*, p. iv.

[19] *Work Norms in Agricultural Operations in Conjunction with Agricultural Techniques*, Central Statistical Board (Moscow, 1927).

so that not only the workstock but also the productive livestock were taken care of before leaving for the field and after returning from it. No special time was, of course, expended on administration in peasant farming. Several other adjustments of the two sets of data should have been made but were not made, and all of them would have cut down the saving of labor attained in the kolkhozy.

TABLE 33.—LABOR INPUT ON EARLY-SOWN GRAINS IN SPECIFIED REGIONS: KOLKHOZY VERSUS INDIVIDUAL PEASANTS*

(Days per hectare, except as noted)

Crop and enterprise	Average	Kalinin	White Russia	Voronezh	Rostov and Krasnodar	Dnepropetrovsk and Odessa	West Siberia
Winter grain							
Individual peasants, 1922–24	22.0	51.5	41.3	23.7	16.3	16.9	....
Kolkhozy surveyed in 1937.	11.7	33.5	17.4	10.6	7.3	10.6	....
Saving *(percent)*	*47.1*	*34.8*	*57.9*	*55.3*	*55.2*	*37.3*	....
Spring grain							
Individual peasants, 1922–24	19.9	39.5	31.6	23.4	13.8	16.6	18.2
Kolkhozy surveyed in 1937.	9.8	20.4	21.7	10.6	6.6	10.1	8.3
Saving *(percent)*	*50.8*	*48.4*	*31.3*	*54.7*	*52.2*	*39.2*	*54.4*

* *Productivity and Utilization of Labor in Kolkhozy* . . . . , p. 5. Data for individual peasants for 1922–24 from a survey by the Central Statistical Board. The data from the two sources are not fully comparable (see text). Early-sown grains comprise wheat, rye, barley, and oats.

It was, for example, hardly correct to use for comparisons with 1937 the data for 1922–24 exclusively, ignoring a survey for 1925.[20] This was done even in those cases where the later survey yielded data obviously better adapted for comparison with 1937. The Voronezh data for 1937 were compared with the 1922–24 data for the Central Chernozem Region (23.4 days on early-sown spring grain), although the 1925 study contained a figure specifically for Voronezh oblast (17.5 days on spring wheat). Similarly, the 1922–24 data indicated 18.2 days per hectare for early-sown spring grains in the steppe areas of Trans-Ural (used vis-à-vis West Siberia), but the 1925 survey

[20] *Production Costs of Farm Products*, edited by N. P. Makarov, Studies of Science-Research Institute in Agricultural Economics, No. 29 (Moscow, 1929), pp. 68–69.

showed the input on spring wheat as only 12.3 days in West Siberia proper. For spring wheat in North Caucasus the 1925 survey showed 12.0 days, as against 13.2 days for early-sown spring grains in the source for 1922–24.[21]

While the available data do not permit definite conclusions, it appears probable that, if all appropriate corrections and adjustments are made, the labor input per hectare of early-sown grains declined from 1928 (average individual peasants) to 1937 (kolkhozy) by somewhat more than one-third.

The official study for 1937 also contained data on the labor input on corn, millet, potatoes, sunflower, fiber-flax, unirrigated cotton, sugar beets, and castor beans, but comparisons with pre-collectivization data were made only for sunflower, fiber-flax, and potatoes (Table 34).[22] The large labor saving on sunflower

TABLE 34.—LABOR INPUT IN SUNFLOWER, FIBER-FLAX, AND POTATOES IN SPECIFIED REGIONS: KOLKHOZY VERSUS INDIVIDUAL PEASANTS*

(Days per hectare, except as noted)

Crop and enterprise	Average	Kalinin oblast	White Russia	Voronezh oblast	Former Azov-Black Sea kral
Sunflower					
Individual peasants, 1922–24.	30.7	....	....	31.8	30.1
Kolkhozy surveyed in 1937...	12.8	....	....	17.7	10.0
Saving *(percent)*	*58.3*	....	....	*44.3*	*66.8*
Fiber-flax					
Individual peasants, 1922–24.	118.4	125.9	107.8	....	....
Kolkhozy surveyed in 1937...	82.7	81.5	84.4	....	....
Saving *(percent)*	*30.2*	*35.3*	*21.7*	....	....
Potatoes					
Individual peasants, 1922–24.	82.3	92.5	78.5	....	....
Kolkhozy surveyed in 1937...	65.1	80.1	59.6	....	....
Saving *(percent)*	*20.9*	*13.4*	*24.1*	....	....

* I. Merinov, "Labor Productivity in Kolkhozy," *Socialist Agriculture*, July 1939, pp. 11–12.

by the kolkhozy was due to the use of the combined grain harvester-thresher for harvesting the sunflower seed (apparently

[21] All data in the paragraph are in terms of man-days. Labor input on early-sown spring grains and in spring wheat may be assumed to be about equal.

[22] Only the summarized results of these comparisons are given in the official source. The data in Table 34 are therefore taken from the article by Merinov, the apparent author of the computations.

with considerable losses). If the 1937 figures for potatoes were properly adjusted, the labor input in the kolkhozy would be the same as in the individual peasant households in 1922–24. There would also be little superiority of the kolkhozy with reference to fiber-flax under those conditions. The result would probably be negative for the kolkhoz flax if the low quality of the fiber produced after collectivization is considered (see page 514).

Relative to its low yields in Russia, corn requires a great amount of labor in the kolkhozy. This is not only because harvesting is a hand operation (mechanical pickers would not pay, with low yields and low wages) and the kolkhozy are poor competitors where hand operations are involved, but also because the kolkhozy fail to keep the cornfields clean with machines alone and have to resort to hand-thinning and weeding. The accompanying data (in workdays) of the 1937 kolkhoz survey[23] imply a per-hectare labor input on corn almost twice as large as on early-sown spring grains and, since the yields of corn were no higher than those of the latter, about twice as high labor inputs per quintal:

	Per hectare		Per quintal	
Oblast or krai	Corn	Early-sown grains	Corn	Early-sown grains
Rostov	14.87	6.59	2.35	0.90
Krasnodar	12.27	7.14	1.30	0.54
Dnepropetrovsk	18.36	7.77	0.98	0.80
Odessa	21.00	10.15	2.16	1.55

The large labor input on corn by the kolkhozy is, incidentally, an adequate explanation of the decline in corn acreage after collectivization (pp. 535–36).

Millet, which requires hand weeding, is another grain crop in which the kolkhozy are unlikely to be materially superior in labor input to the individual peasants. The data summarized below (in workdays) indicate that in 1937 the labor input per hectare in the kolkhozy was substantially smaller in millet than in early-sown spring grains only in Altai oblast, where millet

[23] *Productivity and Utilization of Labor in Kolkhozy . . . . .*, pp. 11 and 12.

received little attention after seeding and returned a very low yield:[24]

Oblast or krai	Per hectare		Per quintal	
	Millet	Early-sown grains	Millet	Early-sown grains
Voronezh	15.34	10.63	3.13	1.17
Novosibirsk	10.01	11.48	1.04	1.05
Altai	5.74	7.26	1.91	0.96

On the whole, considerably more labor per quintal was put in on this cheap crop than on early-sown spring grains.

The kolkhozy apparently use more labor on sugar beets than the individual peasants needed before collectivization. The kolkhozy investigated in 1937 used 131.8 workdays per hectare directly on sugar beets. A special survey of sugar-beet growing by the peasants in 1925 yielded 110 days as the average.[25] Chayanov, who reported the results of the survey, did not mention that the workdays were in terms of man-days, but they probably were. The labor input of the individual peasants per hectare remains below that in the kolkhozy even after a corresponding adjustment. The kolkhozy had substantially higher yields of sugar beets in 1937 than the individual peasants in 1925, but the lower per hectare labor input in the latter, and the fact that only the direct labor is considered for the kolkhozy, take care of the difference in yields. Of interest also is Chayanov's information that, at the time of the 1925 survey, the labor input on sugar beets in the sugar sovkhozy was assumed to have been 136.9 days per hectare by the Sugar Trust, the organization supervising these sovkhozy.[26]

The labor input of 81.76 days per hectare of cotton computed by the study for the investigated kolkhozy in 1937[27] pertained to the low-yielding unirrigated cotton in southern Ukraine and North Caucasus. The irrigated high-yielding cotton in Central Asia required twice as much labor or more. Six advanced kolkhozy in Central Asia investigated in 1939, with a particu-

[24] *Ibid.*, pp. 11 and 14.

[25] A. V. Chayanov, *Production Costs of Sugar Beets*, Studies of Science-Research Institute in Agricultural Economics, No. 43 (Moscow, 1928), pp. 34–35.

[26] The sovkhozy employed more refined techniques and had higher yields than the peasants, but the latter superiority could barely compensate for the larger labor input.

[27] *Productivity and Utilization of Labor in Kolkhozy . . . .*, p. 16.

larly high average yield of 32.3 quintals of unginned cotton per hectare, showed a labor input of 240.5 days per hectare, three times the quantity used on unirrigated cotton.[28] Ignatov stated, without giving source or details, that the kolkhozy used 160 days per hectare of irrigated cotton in 1940.[29] Cotton is repeatedly chopped, topped, and harvested by hand (six hand choppings are prescribed for irrigated cotton), and these operations make up practically the total labor input on cotton.[30] Under such conditions the kolkhozy may even use more labor per hectare of cotton than individual peasants did.

It will be observed that the crops in which the kolkhozy fail to show savings in labor, and may even be less economical (sugar beets, fibers, potatoes, vegetables, etc.), are those with the largest labor inputs per hectare. While all such crops amounted to slightly less than 10 percent of the total kolkhoz cropped plowland in 1937, they made up about 25 percent of the total computed in terms of labor input.

Individual animal products.—One can only be amazed by the information that in the year 1937 the investigated kolkhozy used 46 days of direct labor per cow yielding an average of 1,131 kilograms of milk.[31] The details given in the official study show that a milkmaid on the average took care of only 6.7 cows, 1.6 heifers, and 1.7 calves. She by no means did all the work these animals required; in addition there were herdsmen, barn workers, managers, and so on. These other workers spent 17.7 days per cow per year in addition to the 28.3 days spent by the milkmaids.

The direct input of labor per cow was moderate (33.7 days) only in Novosibirsk oblast, where dairying is an important enterprise and the kolkhozy investigated averaged 65.2 cows. Altai oblast, with similar conditions, showed 47.4 days per cow, while in the remaining oblasti the average yearly labor input per cow was over 50 days.[32]

[28] N. Sapelnikov, "Labor Productivity on Cotton Farms," *Socialist Agriculture*, October 1940, p. 26.

[29] V. Ignatov, "Socialist Cotton Growing in the 4th Plan Period," *Socialist Agriculture*, December 1946, p. 23.

[30] *Productivity and Utilization of Labor in Kolkhozy . . . .*, pp. 16, 44–45.

[31] *Ibid.*, pp. 50–51, 54.

[32] *Ibid.*, pp. 50–51.

The official source contains the following comparison of the labor input per cow per year (in workdays) in kolkhozy in 1932 and 1937 and in individual peasant households in 1925–26, without stating the source of the 1925–26 data:[33]

Oblast	Individual peasants 1925–26	Kolkhozy 1932	Kolkhozy 1937
Voronezh	73.3	58.1	54.4
Kalinin	55.1	53.8	50.6

In Kalinin oblast, more important for dairying, the input of labor per cow was larger in the kolkhozy than in individual peasant households, if all the kolkhoz labor, direct and indirect, is considered.

The figures on the labor input of the kolkhozy in pork production are even more striking. On the farms investigated in 1937 there was an average of one brigadier for each 23.6 hogs, 25.8 shoats, and 39.3 piglets during the winter, and for even fewer animals in the pasturing period.[34] The total yearly labor outlay per animal was as follows (in workdays):[35]

Republic, oblast, or krai	Adult hogs	Shoats (4–9 months)	Piglets
Kalinin	46.0	36.6	23.5
White Russia	21.0	16.3	11.2
Voronezh	24.4	21.7	....
Rostov	18.1	14.0	9.8
Krasnodar	19.0	17.1	9.7
Dnepropetrovsk	....	16.0	8.9
Odessa	....	14.8	10.1
Kiev	18.0	14.9	13.6
Novosibirsk	27.5	15.3	9.7
Altai	29.9	13.0	7.4
Average	21.7	16.7	11.2

A study of hog enterprises of the individual peasants in 1926–27 was made in connection with a general survey of the peasant economy.[36] Unfortunately, neither the Ukraine nor White Russia, the principal hog areas, was included. The study also failed to state the labor input in two areas covered by it

[33] *Ibid.*, p. vii.
[34] *Ibid.*, p. 58.
[35] *Ibid.*, p. 56.
[36] *Production Costs of Farm Products*, pp. 212–37.

(Stavropol and Armavir). The data, so far as they could be extracted from the source, are presented below:

Raion and oblast	Days per animal per year	Composition of the herd in percent		
		Hogs	Shoats	Piglets
Kotelnich, Vyatka	8.9	52	48	..
Opochetsk, Pskov	21.3	21	64	15
Graivoron and Belgorod, Kursk	25.3	..	..	..
Shchigry, Kursk	27.1	..	..	..
Rossosha, Voronezh	19.2	..	..	..

Conditions are similar in Pskov and Kalinin oblasti. Yet the time spent by individual peasants per pig in Pskov oblast in 1926–27 was not more than one-half that used by the kolkhozy in Kalinin oblast in 1937. In Voronezh oblast, too, the input per animal by the individual peasants in 1926–27 was less than by the kolkhozy in 1937. In general, the direct labor alone on hogs in the kolkhozy in 1937 apparently was greater than the total labor of the individual peasants on these animals in 1925–26.

A special study of labor organization in commercial kolkhoz poultry fermy gave as the recommended norms of work the care of 500–700 chickens per chicken woman and 1,000 chicks per chick woman, and these workers were not expected to perform all the work on their charges.[37] Dyakov, the author of this study, cited among examples of well-organized kolkhoz chicken fermy that of the kolkhoz "The Ray of Light," with 1,400 chickens and 5,000 chicks, and a personnel of seven: one superintendent, two chicken women, three chick women, and one guard. The second exemplary ferma described by Dyakov had a personnel of eleven for 2,765 chickens and around 5,000 chicks. He may have neglected to mention the labor of those doing occasional work on the chicken fermy, such as hauling. He further says: "Under conditions such as exist in Moscow, Kalinin, and Tula oblasti, where the chicken fermy are commonly small (100 to 300 fowls), only one worker is assigned to the ferma. During the breeding period he is given an adolescent as an assistant." These labor outlays are so large that the individual peasants may have been superior in labor input per 100 eggs, although

[37] Dyakov, *op. cit.*, p. 91. The study was published in 1940.

their chickens laid fewer than half as many eggs as those in the kolkhoz fermy.

KOLKHOZNIK ENTERPRISES

At first glance it seems highly uneconomical to have some 18 million tiny enterprises of the kolkhozniki—with an average of little more than one acre of land, two-thirds of a cow, two-thirds of a pig, and one and two-thirds sheep, and a few chickens in each—along with the 200,000-odd large and super-large enterprises (kolkhozy and sovkhozy). While the latter are to a considerable extent mechanized, and to a certain extent equipped with other modern techniques, the kolkhozniki have to do practically all the work on their lots with the spade, water can, and similar simple implements.[38] However, the productivity of labor in the kolkhozy is so low, especially in the enterprises on which the kolkhozniki concentrate, that the latter do not need to blush for the labor efficiency attained in their tiny businesses.

The survey of the 430 kolkhozy in 1937, utilized above, also covered the labor input of kolkhozniki in their own enterprises. The survey revealed an average total input per household in all crop and livestock enterprises of 908 hours a year. Unfortunately, since the size of these enterprises was not given, no direct comparison with the average labor input in the kolkhoz operations is possible.

However, the average sizes of the private enterprises of all kolkhozniki for entire regions are available. Since very low upper limits are set by law upon the size of the gardens and the livestock numbers of the kolkhozniki, and there is no reason to suppose that the private enterprises of the members of the investigated kolkhozy were substantially larger than those in all kolkhozy of the corresponding regions, the use of data for the latter for computing the labor productivity in kolkhoznik enterprises is not likely to lead to significant errors.

[38] The kolkhozniki were, of course, very eager to obtain a horse, at least for the first working of their plots in the spring. Since they rarely were able to get a horse from their kolkhoz, there was a brisk demand for hiring one of the few horses still remaining in the hands of the individual peasants. The latter, indeed, used to perform the first plowing for the kolkhozniki personally with their horses. For reasons which a common mortal is unable to grasp, this activity of the individual peasants was found highly objectionable, and the horses of the individual peasants were subject to especially severe taxation (see p. 314).

To provide a comparison of the actual kolkhoznik labor input in their private enterprises (908 hours a year per household) with the actual labor input in kolkhoz operations, a hypothetical total is computed, based on size kolkhoznik enterprises of a region as a whole (White Russia) and the direct labor input (excluding administration, care of workstock, and so on) per hectare of land and per head of productive livestock in the investigated kolkhozy of the same region (Table 35). The astonishing fact is revealed that the kolkhozy display little if any superiority over the private enterprises of the kolkhozniki.

At the labor-input rates of the kolkhozy, White Russian kolkhozniki would have needed on the average 103 workdays per year for their own enterprises, as against the survey figure of 908 hours. Since the average workday in the kolkhozy was equivalent to about nine hours,[39] the actual input of labor by the members of the investigated White Russian kolkhozy in their private enterprises was no larger than that computed for the average enterprise of all White Russian kolkhoz members at the rates of the labor input in the White Russian kolkhozy investigated. Moreover, one must remember that the labor spent in the kolkhozy on administration, care of workstock, and so on, was not considered at all. Also, the work of the collective members on their own enterprises consisted of man work to the extent of only 13 percent. Men accounted for a much larger proportion of the total work for the kolkhozy investigated than in the kolkhozniki's enterprises, even in those specific operations which were involved in the kolkhoznik enterprises. Any labor which might have been hired by the collective members, or the labor supplied to them by the kolkhozy,[40] fell far short of compensating for the factors enumerated. Since the labor input of the kolkhozniki in their enterprises in White Russia was given by the source in hours, it is conceivable that consequently only the net labor input was counted in this case and that the conversion of the work for the kolkhoz at nine hours to the workday is too high.

Similar data by Stetsenko for the Ukraine are fortunately

[39] *Socialist Agriculture USSR, 1938*, p. 98, gives 9.6 hours for July-August 1938.

[40] The latter amounted to only 0.2821 days per household in the investigated White Russian kolkhozy in 1937. See *Productivity and Utilization of Labor in Kolkhozy . . . .*, p. 97.

stated in days. These data indicate that in 1938 the kolkhozniki in the Ukraine used on their own private farm enterprises an average of 95.6 days,[41] of which only 6.8 percent were man-

TABLE 35.—LABOR INPUT IN PRIVATE ENTERPRISES OF KOLKHOZ MEMBERS IN WHITE RUSSIA, COMPUTED AT RATES INDICATED

Enterprise	Average holdings per kolkhoz household in all White Russia[a]	Input in kolkhozy investigated, per hectare or per head of livestock[b] (*days per year*)	Hypothetical input in kolkhoznik enterprises at the rates of the kolkhozy investigated (*days per year*)
All land (*hectares*)	0.45	....	....
Potatoes, vegetables, fibers	0.32	59.6[c]	19.1
Grain and sown grasses	0.09	19.4[d]	1.6
Livestock (*head*)			
Cows	0.82	44.1	36.2
Other cattle	0.43	....	6.9
Heifers and yearlings	....	13.8	....
Calves	....	18.5	....
Hogs	1.91	....	35.0
Adult hogs	....	21.0	....
Shoats	....	16.3	....
Piglets	....	11.2	....
Sheep and goats	1.01	....	5.0
Sheep	....	5.2	....
Lambs	....	4.3	....
Hypothetical total	....	....	103.8

	Actual labor input by kolkhoz households (*hours per year*)
All enterprises	
Men	118
Women	790
Total	908
Hypothetical total (from above) converted to hours	934

[a] Data from official sources. Acreages for 1938; livestock as of Jan. 1, 1938.

[b] *Productivity and Utilization of Labor in Kolkhozy in the 2d Five-Year Period* (Moscow and Leningrad, 1939). Only the inputs directly assessed to the specific crops and types of livestock are shown. Thus the labor spent on the care for workstock, administration, and so on, is not included.

[c] Potatoes.

[d] Grain.

[41] Stetsenko, *op. cit.*, p. 30, gave the total workdays in the kolkhozy in 1938 as 1,478 million and (p. 31) the relation of the work in kolkhozy to that on kolkhoznik enterprises as 80 to 20. There were 3,866,700 kolkhoz households in the Ukraine on July 1, 1938.

days. Let us again apply the rates of labor input in the investigated kolkhozy[42] to the average acreages and livestock herds of the average Ukrainian kolkhoz peasant.[43] At those rates, the livestock of the average kolkhoznik alone would have required 62.5 days; 30.8 days for 0.58 cow, 13.8 days for 0.6 other cattle, 16.5 days for 1.08 hogs, and 1.4 days for 0.27 sheep and goat. In addition, some 16 days would have been needed at the stated rates for the average crops of the collective member (about 15 days for 0.27 hectare of potatoes and one day for 0.1 hectare of the other crops, mainly grain). Thus the total was some 78.5 days as against the actual figure of 95.6 days. Again, one must recall that the rates of labor input in the kolkhozy cover only the direct labor, and that the labor on the kolkhozniki's own enterprises was man-labor only to the extent of 6.8 percent. If the proper adjustments are made of the data for the kolkhozniki, it seems quite evident that the labor input of the kolkhozy is little or no lower than that of their members in corresponding private enterprises, or of the average pre-collectivization peasants since their labor productivity must have been higher than that of the kolkhozniki.

SOVKHOZY

No study of the labor productivity in the sovkhozy covering a sufficiently large and representative sample has come to the attention of the writer. Only a very crude comparison of the productivity of labor in the sovkhozy with that in the rest of Soviet agriculture is possible. Assuming 2.0 million yearly and seasonal workers and employees in the sovkhozy in 1938, and 1¼ dependents per worker or employee, the population dependent on the sovkhozy was equivalent to 4.5 million or about one-twentieth of the total population engaged in agriculture (the total for sovkhozy and MTS was 6.1 million; see p. 712). Since the share of the sovkhozy in the volume available for sale and for consumption in the farm home was moderately above 10 percent of the total (p. 263), the productivity per man in the

[42] The investigated Ukrainian kolkhozy were located in Dnepropetrovsk, Odessa, and Kiev oblasti; a simple average of the data for the three oblasti is used. Only the direct labor input on the specific crops and kinds of livestock was considered in the official computation.

[43] Acreages of 1938; livestock as of Jan. 1, 1938.

sovkhozy in this first approach would appear to have been roughly twice that in the whole of agriculture.

Several factors make the difference between the sovkhozy and kolkhozy in productivity per man appear substantially higher than it actually was. First, sovkhoz workers consist to a much greater extent of men, and of men of the best working age, and there is a much higher proportion of skilled workers and employees among them. Secondly, owing to the relatively high cost of labor in the sovkhozy as compared with the kolkhozy and individual enterprises of the kolkhozniki, the sovkhozy grow little of the crops that require great inputs of labor, and such low-yielding operations as hand weeding of grain or gleaning in grain fields are seldom practiced. They also have little livestock. Last but not least, owing to greater mechanization the sovkhozy have a proportionately greater outlay for machinery, fuel and depreciation.

Like the kolkhozy, the sovkhozy are particularly inefficient in the utilization of labor in crops needing a great deal of handwork and in animal husbandry. Six sovkhozy investigated in Central Asia, with an average yield of irrigated unginned cotton of 21.8 quintals in 1939, used 118.1 workdays per hectare on the average. Thus 18.5 kilograms were produced in the sovkhozy per workday as against 13.4 kilograms in the six kolkhozy simultaneously investigated.[44] The superiority in output per worker was only 38 percent and part of it may have been due to proportionately greater use of fertilizer.

Nesmii mentioned a ferma of the sovkhoz "Krasnaya Poima," Moscow oblast, which in 1939 had 91 workers and employees for 147 cows with their offspring. This personnel was distributed as follows:[45]

Administration	9	Milkmaids	31
Technicians	5	Barn workers	33
Brigadiers	4	Transportation	9

The whole sovkhoz had 569 permanent and 111 seasonal (in terms of permanent) workers and employees for 970 cows and

[44] Sapilnikov, *op. cit.*, pp. 26–27.

[45] M. Nesmii, "Combination of Enterprises and Utilization of Labor in Sovkhozy," *Socialist Agriculture*, December 1946, pp. 29–31.

585 hectares. While this sovkhoz was cited as an example of those with excessive personnel, Nesmii hastened to add that it was by no means the worst in this respect.

The small productivity of the sovkhozy is apparent also from their small output per worker, as measured in the deliveries to the state in 1937—weatherwise a very favorable year. The per-worker figures for that year were (in quintals):[46]

Sovkhozy	Product	Average output
Grain	Grain	344.4
Sugar beet	Sugar beets	130.7
Cotton	Unginned cotton	18.8
Dairy-beef	Milk	36.9
	Slaughter animals[a]	3.9
Hog	Slaughter animals[a]	7.1
Sheep	Wool	1.72
	Slaughter animals[a]	6.2

[a] Live weight.

The sugar beets delivered per laborer represented the return of considerably less than one hectare of sugar beets. The cotton delivered was the yield of around one and one-fourth hectares of irrigated cotton. Only about one litter of piglets could be raised per all-year laborer in the hog sovkhozy. Even the figure of 344.4 quintals of grain per laborer of the grain sovkhozy is not imposing if one considers that employees were not included, that 1937 was an exceptionally good crop year, and that practically all the crop ex-seed was delivered. If such data on deliveries per laborer are given in such publications as *Socialist Agriculture USSR, 1938*, it is because putting them beside even lower figures for earlier years (1933 and 1935 in this case) can create the impression of achievements.[47]

SOCIALIZED AGRICULTURE AS A WHOLE

Early in this chapter the increase in annual output per agricultural worker from 1928 to 1938 was estimated at not quite

[46] *Socialist Agriculture USSR, 1938*, p. 37. Sovkhozy of the Commissariat of Sovkhozy. The sovkhoz deliveries include the payment for labor in kind and thus are practically equal to the output, in the case of the grain sovkhozy to the output ex-seed. These official figures are computed per laborer, not including the numerous employees.

[47] The hog sovkhozy, for example, in 1933 delivered only 1.9 quintals of hogs, live weight, i.e., two hogs of below-normal size, per all-year laborer.

30 percent before deducting the work which in the meantime had been taken over by non-agricultural labor, and at less than 20 percent after this work was deducted. The computation was made in terms of values. The picture becomes clearer when the same computation is made in terms of worktime.

The subsequent analysis is in two stages. First the assumption is made that the operations on the individual crops and livestock enterprises in the various regions were the same in 1928 and 1938, and that the required worktime for each operation also remained unchanged. The next step is to consider the changes in the operations and in the time needed for them.

First step.—Cropped plowland was expanded by 21.2 percent from 1928 to 1938. The increase in the required worktime was, however, somewhat smaller, because the expansion was mainly in areas with relatively small labor inputs on the same crops. Thus about half of the new cotton acreage was in unirrigated cotton, which requires only about one-half as much worktime per hectare as irrigated cotton. Furthermore, part of the increase in worktime requirements for the cropped plowland was offset by the substantial decline in natural meadows. The expansion of sown grasses requiring little labor, an expansion much greater than that in total cropped plowland, approximately compensated for the enlargement of total worktime requirements due to the large expansion in technical crops needing greater labor inputs. All in all, an itemized computation, not reproduced here, leads to the conclusion that the total worktime requirements in the production of crops including natural hay—with the amount of operations in each crop and region and the time needed for each operation unchanged—increased by 15 to 20 percent.

Labor requirements for the much reduced livestock naturally declined substantially. The saving on horses alone almost offset the increase in the requirements for crops, and the saving on requirements for all animals more than offset the latter increase.

Second step.—Let us now consider first the changes in the amount of work involved in certain individual operations and their combinations. The considerable decline in the available manure involved a saving of worktime on saving, carting, and

spreading it. The loss of part of the straw in harvesting with the combine meant a saving in time for bringing in that straw. On the other hand, more operations were performed on some crops and on some animal enterprises in 1938 than in 1928. Part of these operations returned little, another part was waste, but here all must be counted. Yields increased moderately except for hay, sunflower seed, and some minor crops. The plowing was deeper in 1938 than in 1928. Considerably more disking of fallow land was done. Work on spreading commercial fertilizer increased greatly, although little of it is involved. Much more hand weeding and gleaning took place in 1938 than in 1928. The average number of daily milkings per cow increased. American farmers may refuse to believe that three to four daily milkings per cow, averaging much less milk than the average in the United States, are believed normal, and that as many as six milkings per day were reported in 1945.[48]

It seems impossible—at least at the moment—to attempt a computation of the balance between eliminated and added operations. There is no doubt, however, that the additions were large enough to turn the decline in total needed work arrived at in Step 1 into an increase, though probably a moderate one.

Thus with the productivity of labor as of 1928, the total amount of work per adult person in 1938 would have to be larger than in 1928 by (1) the decline in the number of adult persons and (2) the increase in the needed total worktime.

Worktime per adult in agriculture actually increased considerably from 1928 to 1938 (see introduction to this chapter). But the workers exerted themselves less when performing for the kolkhozy and sovkhozy than in their private enterprises. It would be going too far to assume that in the much longer worktime in 1938 the farm workers spent only as much energy as in 1928. But even this would mean that the greatly advertised mechanization, plant enlargement and other innovations had just made up for the decline in the number of adult persons and for the increase in total worktime which would have been required in 1938 at the 1928 labor productivity. The whole decline in adult persons on farms was only about 10 percent, while the added

[48] P. Shkobin, *op. cit.*, pp. 49–51, and *Socialist Agriculture*, June 1945, p. 19.

operations to a considerable extent consisted of those producing only a small reward if any. Everything can be summed up in a Russian saying: "A mountain yielded a mouse."

At first glance, when one thinks of the huge farms and the large tractors and combines which have replaced the peasants' tiny strips, small horses, and scythes and sickles, such a conclusion seems incredible. On second thought, however, about one quarter of the total farm output in 1938 was produced in the tiny enterprises of kolkhozniki, individual peasants, and rural and city workers, with a labor productivity certainly lower than the pre-collectivization average. The kolkhozy used vast amounts of labor in their livestock enterprises, and the sovkhozy were little more effective in these. Little or no saving in labor was attained by the kolkhozy and sovkhozy in fibers, sugar beets, potatoes, and vegetables, and these crops are the ones that require large labor inputs per hectare. The gains in labor productivity were more or less confined to those attained in growing the four major grains (wheat, rye, barley, and oats), sunflower seed, and similar crops that are harvested with the combine. Under the peculiar Soviet conditions, even these gains were not very large.

THE USSR AND OTHER COUNTRIES

An economy which is unable to show a large superiority in labor productivity over the tiny enterprises of average pre-collectivization peasantry, or even the kolkhozniki, is obviously no match for the agriculture of advanced countries. The aim, repeated over and over, "to reach and exceed all countries of the world" is nothing short of the bitterest irony, at least so far as concerns the labor productivity of the kolkhozy and of Soviet agriculture as a whole.

American farms and Russian agriculture.—The United States, with a considerably smaller population than the USSR, produces substantially more agricultural products. This superiority is particularly large in animal products, especially meat. In 1938 the United States produced two and one-half times as much meat of the principal animals as the USSR. The United States production of poultry was almost four times, and that of eggs three times, as large. All in all, the prewar net agricul-

tural production of this country was about one and one-half times the Soviet production.[49] The agricultural population of the USSR was about three times that of the United States (90 million as against 30 million); hence the net agricultural production per person depending on agriculture was about four and one-half times as large in the United States as in the USSR. A computation per gainfully employed person would have led to even less favorable results for Soviet agriculture, because women participate heavily in the farm work in the Soviet Union but do little of it in the United States. The effect of this, it is true, is partly offset by the fact that the proportion of children in the total farm population is much larger in the USSR.

Since the productivity per man in the sovkhozy is far less than double that in all Soviet agriculture, and American agriculture exceeds that of the USSR by four and one-half times in labor productivity, the sovkhozy, proclaimed the largest and most modern enterprises of the world, make a poor showing as compared with the average American farm.

The comparison between the prewar net agricultural production per person in the United States and the USSR, unfavorable as it is for the latter, does not show the full difference. The productive capacity of American agriculture was not utilized fully before the war. Prices were not high enough to induce the less efficient farmers to attain full production. Moreover, both inefficient and efficient farmers were paid by the state to limit their production of certain products. The true productive capacity of American agriculture was disclosed only during the war, when the farm population declined, agricultural production increased, and production per person rose substantially (by about 35 percent from the average of 1935–39 to 1944).[50] Soviet agriculture, by contrast, was utilized to the utmost before the war, and its output declined greatly during the war, even in areas never occupied by the enemy.

In order to illuminate the wide difference in productivity per

[49] For details and the method of computation, see N. Jasny, "Labor Productivity in Agriculture in USSR and USA," *Journal of Farm Economics*, May 1945, XXVII, 421–25. Thanks are due the editor for permission to reproduce parts of that study.

[50] G. T. Barton and M. R. Cooper, *Farm Production in War and Peace* (U.S. Dept. Agr., December 1945), p. 41.

person in the USSR and the United States, it seems appropriate to reproduce the comparison of the labor inputs in important crops and kinds of livestock on the farms of the United States and in the kolkhozy of the USSR from the writer's article cited above (Table 36). The data for the United States are officially computed averages for the whole country. Thus they include the labor inputs in millions of rather inefficient tiny farms, by

TABLE 36.—LABOR INPUT ON SPECIFIED CROPS AND LIVESTOCK ON INVESTIGATED COLLECTIVE FARMS OF USSR AND ON AVERAGE FARMS OF U.S.A.*

(Days per acre or per head of livestock per year, except as noted)

Item	USSR	U.S.A.
Crops		
Fall-sown small grains	4.74	....
"Early" spring grains (wheat, barley, oats)	3.95	....
Millet	4.96	....
Wheat	....	0.87[a]
Rye	....	0.99[a]
Barley	....	0.96[a]
Oats	....	0.90[a]
Corn	6.26	....
Harvested from standing stalks	....	2.42[b]
Cut, shocked, and husked	....	3.63[b]
Cotton	33.10	9.10
Sugar beets	53.38	9.20
Potatoes, white	26.74	6.80
Livestock		
Cows	46.00	14.00
Milk, per 100 pounds	1.89	0.30
Heifers and young bullocks	24.00	....
Calves	23.00	....
Beef cows	....	2.30
Adult hogs	22.00	....
Shoats	17.00	....
Piglets	11.10	....
Hogs, per 100 pounds, live weight	....	0.39
Sheep	4.00	0.62[c]
Lambs	3.00	....

* The figures for USSR from *Productivity and Utilization of Labor in Kolkhozy* . . . . The figures for the United States are from M. R. Cooper and others, *Labor Requirements for Crops and Livestock* (U.S. Dept. Agr., Washington, 1943). The United States source gives the figures in hours; they are converted to a day basis by assuming ten hours per day.

[a] The labor on threshing supplied by the owners of the stationary threshing machines is not included.

[b] Assuming the pre-harvest labor to have been the same for both methods of harvesting.

[c] Includes care of lambs until weaning time.

share-croppers and the like. The data for the USSR are those for the kolkhozy investigated in 1937. The fact that they include only the direct inputs of labor on specific crops or on specific kinds of livestock enterprises is in this case largely compensated for by the fact that the labor in the United States is almost exclusively man labor, while in the USSR woman and child labor makes up almost half of the total and is included in the estimates without any adjustment.

American farmers and kolkhozy: Crops.—It was shown that the kolkhozy are relatively most efficient in early-sown grains. Yet three to four times as much labor per hectare was spent on these crops in the USSR as in the United States, if the labor provided by the owners of the hired threshing machines is added to the figures shown in the table for the United States (Table 36). The lowest figure given in the USSR source is 2.7 days per acre of early-sown spring grain in the Azov–Black Sea region. All but 4.1 percent of the plowing was done by tractors and 65.2 percent of the acreage was harvested with the combine in this region in 1937. For Nebraska, where only 51 percent of the wheat acreage was harvested with the combine, the United States source gave 5.7 hours of labor per acre of wheat. Almost as much (5.2 hours) was used in the Azov–Black Sea region on hand weeding alone. Even more time (9 hours in Rostov oblast and 13 hours in Krasnodar oblast)[51] was used on "other harvesting work," of which gleaning probably constituted a large part.

The kolkhozy used almost twice as much labor on an acre of their low-yielding corn as was used in the United States on corn cut, shocked, and husked. In the kolkhozy investigated in 1937, about three-quarters of the corn was harvested by hand at an input of 1.7 days per acre, or more than an hour per bushel. The standard practice of hand-picking corn in the USSR is much less efficient than that in vogue in the United States. In the Soviet Union the worker—usually a woman—picks the cobs of two rows and carries them, unhusked, in a sack attached to her belt. When she has 15 to 20 kilograms, she dumps them on the ground. Husking is performed in a special operation on the

[51] *Productivity and Utilization of Labor in Kolkhozy . . . . ,* p. 31.

threshing floor. After the ears are removed the stalks are cut, dried, and stacked.[52] As much as 1.3 days per acre of corn were used in the kolkhozy on "other work in harvesting."

The average labor input in cotton on United States farms is kept at a high level by the large proportion of this crop grown on tiny farms with very backward methods. Also, part of the American cotton is irrigated. In spite of this, the labor input on *unirrigated* cotton in the USSR was almost four times as large as the average input in the United States. The comparisons of the input of labor on cotton on collective farms with that on farms in the old South[53] shows that, no matter how cheap labor may have been in that area before the late war, it was spent even more lavishly, more wastefully, in the collectivized agriculture of the USSR.[54]

American farmers and kolkhozy: Animal products.—Since the investigated kolkhozy devoted 46 days to each of their low-yielding cows and the average American farmer used only 14 days on his relatively high-yielding cows, more than six times as much labor was used per 100 pounds of milk in the kolkhozy as by the average American farmer.

It was stated that there was one brigadier, not participating in the physical work, for each 23.6 hogs, 25.8 shoats, and 39.3 piglets on the investigated collective farms in wintertime. In some other countries a man with no other help would have taken care of all those pigs and had time for other work. The figures indicate for the kolkhozy the huge amount of perhaps 7 days per 100 kilograms of hogs (live weight) as against an average of 3.2 hours for American farms.

Nor do the sovkhozy make a much better showing in hog raising than the kolkhozy. The hog sovkhozy delivered to the state 710 kilograms of hogs (live weight) per all-year laborer (not including employees) in 1937. According to American standards,[55] to produce that quantity a total of considerably less

[52] *Problems of Organization of Kolkhoz Production* (2d ed., Moscow, 1946), p. 147.

[53] See, for example, A. D. McNair, *Labor Requirements of Arkansas Crops* (U.S. Dept. Agr., Bull. 1181, Washington, 1924), p. 10.

[54] The Arkansas farms reported on by McNair used per acre of cotton only about 30 percent as much labor as was spent on unirrigated cotton by the kolkhozy of the USSR, and they may have increased their productivity since McNair made his survey.

[55] Barton and Cooper, *op. cit.*

than one month of labor would be needed (50 hours directly on hogs and 110 hours to grow 4 acres of corn for their feed).[56]

Quite a few American college students in their spare time take care of as many chickens as the persons in charge of many a kolkhoz poultry ferma, who devote all their time to their charges and have a young assistant during brooding time (see above, p. 432). All told, there are several times as many chickens per worker on chickens in the United States as in the kolkhozy.[57]

Germany.—German agriculture is only moderately mechanized. Such countries are treated in the Soviet Union with considerable disdain. Yet even in prewar Germany the net agricultural production per person of agricultural population was probably almost three times as large as in the USSR. The prewar net agricultural production of Germany[58] was about half of that of the Soviet Union (in value), while the agricultural population (13 million in 1939) was little more than one-seventh of the Russian.

[56] Revised as compared with the computation in the *Journal of Farm Economics*, May 1945. See note 49, p. 442.

[57] A commendable comparison of the labor productivity in agriculture of the USSR and the United States was made by M. Kubanin ("The Level of Productivity of Labor in Agriculture in the USSR and the USA," *Problems of Economics*, January 1941). He reached approximately the same conclusions as those reached here. Kubanin's study was subjected to detailed scrutiny in *Bolshevik*, June 1941, and a few minor slips in his work were used as a pretext to label it as falsification. Even the behavior of the editor of the journal, who had published Kubanin's article with the reservation that it was offered only as material for discussion, was called betrayal.

[58] Without Austria and Sudetenland.

PART IV

SOCIALIZED PRODUCTION PLANS AND RESULTS

CHAPTER XIX

MECHANIZATION

The almost religious attitude of the Communists toward the tractor is revealed in many ways. As mentioned earlier, the differences in costs of tractor and animal power are ignored. Tractors are regularly used in areas, in operations, and under conditions where animal power would be more economical.

That tractor work is much superior in quality to animal work has been part of the creed, not to be questioned. This the Soviet experts still believe, or must pretend to believe, after considerable experience with the tractor.

In the United States, where tractors were developed, it is well known that only by comparing adequate tractor work with inadequate animal work can the quality of the former be regarded as superior. The quality of the work of track-laying and rubber-tired tractors is about equal to that of animals; the work of tractors with steel wheels is slightly inferior, owing to their great pressure on the ground.

In the matter of quality, the only advantage correctly claimed for the tractor outside of the USSR is that it makes possible a better timing of operations. This advantage arises from the fact that farms using tractors normally have much more power than farms using animals can afford to have.[1] Moreover, when necessary, tractors can be used longer hours and even at night. Work can thus be concentrated at favorable times. But there is no abundance of draft power on Soviet tractor farms; tractors there are normally used very intensively, and night work is a regular practice.

The near-reverent attitude is not reserved for the tractor; it

[1] This is the result of several factors: (*a*) the large unit of the tractor, (*b*) the lower cost of a horsepower-hour in larger than in smaller tractors, and (*c*) last but not least, the fact that the cost of animal work consists of fixed costs to a considerably greater extent than that of tractor work. See Naum Jasny, *Research Methods on Farm Use of Tractors* (New York, 1938), chapter vi.

extends to farm machinery in general, especially the combine. If the tractor is the god of this new religion, the combine is the son. It would certainly be news to the Kansas farmer that "in western Kansas the combine gives an additional yield of 4 to 6 quintals per hectare [6 to 9 bushels per acre]."[2] Many a farmer in western Kansas averages no more than 9 bushels per acre—tractor, combine, and all. In the USSR the combine is used under decidedly improper conditions to an even greater extent than the tractor.

Setting unattainable goals is a characteristic of Soviet planning. Yet such was the fervor for the machine that, except in the early years of the collectivization drive,[3] some of the mechanization goals for agriculture were fulfilled (almost the only ones pertaining to agriculture that were), and a few were even exceeded. Where efforts fell short of plans, the degree of nonfulfillment, or the delay in fulfillment, was relatively minor. The faith in mechanization was so strong that Herculean efforts and enormous sacrifices were made to attain the goals. Domestic output of machinery was pushed strongly. In the face of critical domestic shortages in the early 'thirties, exports of food—food virtually torn from the mouths of starving people—were kept at a high level. The proceeds were largely utilized to pay for imports of equipment, including tractors and tractor-drawn farm machinery. Of course, after about half of the work animals had disappeared in the turbulent early 'thirties, it became particularly urgent to provide agriculture with machinery and, especially, mechanical draft power.

GENERAL: GOALS AND ATTAINMENTS

1st and 2d Plan Periods.—The phenomenal increase in the use of farm machinery, especially mechanical power, during the

[2] G. E. Studenskii, *Technical Revolution in American Agriculture* (Samara, 1930), here quoted from Y. Nikulikhin, *Industrialization of Soviet Agriculture* (Moscow, 1931), p. 218.

[3] Perhaps the most striking example of unfulfillable goals with reference to farm machinery was the order of the Central Executive Committee of the USSR of December 1929. According to this, the Chelyabinsk factory, for example, was to produce 1,500 tractors in 1930–31 (October–September) and 30,000 tractors in 1931–32. The first tractors were delivered by that factory in 1933, and only 300 were produced in that year. At least 45,000 combines were to be manufactured by Oct. 1, 1933, according to the same order, but only 13,719 combines had been turned out by Jan. 1, 1934. See also pp. 452–53.

collectivization period is shown in Table 37. The power of available tractors was increased more than thirty fold between 1928 and 1938, and there were more than 150,000 combines and almost 200,000 trucks on Soviet farms in 1938 as against

TABLE 37.—FARM MACHINERY, 1928 AND 1938*
(*Thousand units*)

Types of machinery	1928	1938
Tractors		
Number	26.7	483.5
Horsepower	278.1	9,256.2
Plows		
Primitive[a]	4,600	...
Modern		
Tractor	9.3	493.5
Horse	14,000	5,500
Seeding machines		
Tractor	0.5	265.5
Horse	717.9	676.4
Grain harvesters		
Combines	0[b]	153.8
Binders, tractor	0.1	10.7
Binders, horse	53.9[c]	44.2
Reapers and mowers	1,299.7	896.2
Threshers		
Relatively complicated	5.6	130.8
Simple	552.0	297.4
Beet harvesters	0	19.3
Flax-tousling machines	0	10.5
Trucks	0.7	195.8

* Data for end of the year from *Socialist Agriculture USSR, 1938*, Gosplan (Moscow, 1939), pp. 17–20. Data for 1938 preliminary.

[a] Sokhi, kosuli, and others.

[b] Two units only.

[c] For 1933.

virtually none a decade earlier. The effect of this stupendous expansion in machinery was greatly augmented by the rapid increase in the intensity of use of each machine. By 1938, the rate of annual use far exceeded that in other countries, especially where, as in the United States, natural conditions were broadly similar. This intensive use of tractors and other machinery permitted the achievement of a considerable degree of mechanization with a relatively moderate amount of mechanical power.

The change from primitive to mechanized methods between 1928 and 1938 was little short of revolutionary (Table 38).

TABLE 38.—MECHANIZATION OF THE PRINCIPAL OPERATIONS IN AGRICULTURE, 1928, 1932, AND 1938*

(*Percent of acreages*)

Operation	1928	1932	1938
Plowing for spring crops			
Sokha	9.8	0	0
Plow			
Horse	89.2	81.0	28.5
Tractor	1.0	19.0	71.5
Seeding of spring grain			
Hand-sown	74.4	51.7	12.8
Machine and horse	25.4	28.3	30.5
Machine and tractor	0.2	20.0	56.7
Harvesting grain			
Hand	44.4	35.4	8.5
Machine and horse	55.4	54.6	43.1
Machine and tractor	0.2	10.0	48.4
Combine and tractor	0	4.0	48.4
Threshing grain			
Hand and other primitive methods	40.7	60.0	0.6[a]
Threshers operated by horsepower	58.0		5.4[a]
Threshers operated by mechanical power	1.3	40.0	95.0

* Data from *Socialist Agriculture USSR, 1938*, p. 24. See pp. 468–69 for comments.
[a] The year 1937.

Three-quarters of the grain acreage was seeded by hand in 1928; by 1938 the proportion had been reduced to one-eighth. The acreage harvested by hand decreased from 45 percent to less than 10. Threshing by hand, and with such crude devices as animal-drawn rollers, disappeared. The replacement of mowers on a large scale by the combine, so far as it occurred under proper conditions, also meant the elimination of a great deal of handwork in binding and transporting the sheaves, and in threshing with the stationary thresher.

No great importance can be attached to the fact that plans for the mechanization of the operations enumerated in Table 38 were usually not entirely fulfilled. The following tabulation reveals the degree of non-fulfillment of certain goals set by the 2d Plan for 1937 (in percent of areas involved):[4]

[4] Planned percentages from *2d Plan*, I, 210; actual percentages from *Socialist Agriculture USSR, 1938*, p. 24.

Operation	Planned	Actual
Plowing		
Horse	20	29
Tractor	80	71
Spring seeding		
Hand	None	15
Horse	45	31
Tractor	55	54
Harvesting		
Hand	None	10
Horse	40	46
Tractor	60	44
Threshing		
Stationery thresher	100	99
Primitive methods	0	1

Mechanization of agriculture, however, was by no means carried so far as the data in Tables 37 and 38 were intended to indicate (see below, pp. 468–69).

3d Plan Period.—The 3d Plan provided for an increase in the power of farm tractors from 8.4 million horsepower at the end of 1937 to 13.0 million at the end of 1942, an increase of 55 percent.[5] The amount of work performed by the MTS tractors (excluding threshing) was to rise from 203.1 million to 330 million hectares of "standard plowing," or by 63 percent (on standard plowing as a unit see page 466). No improvement in timing of operations and, especially, no increase in the availability of reserve power for emergency needs would have occurred under these conditions.

The rate of increase in tractor power on farms during the peace years of the 3d Plan Period was slower than that provided by the plan, in part because of preparations for war. In 1940 there were about 525,000 tractors on the farms of the enlarged territory[6] with a total power of slightly over 10 million horsepower. The MTS tractors did only 225 million hectares (including threshing) in terms of standard plowing in 1940.

The number of combines was to be almost doubled during the 3d Plan Period—from 128,800 at the end of 1937 to 250,000 at the end of 1942—and the area harvested by them was ex-

[5] *3d Plan*, p. 220.

[6] *Socialist Agriculture*, June 1946, p. 46.

pected to increase by 116 percent. Three-quarters of the total grain acreage was to have been combine-harvested in 1942 as against 33.6 percent in 1937. In 1940 there were about 182,000 combines on farms, and they harvested 43 percent of the grain acreage in that year.[7]

The 3d Plan prescribed "the completion of 'complex' mechanization of farm work . . . . special attention to be devoted to the mechanization of labor-intensive operations in animal husbandry."[8] "Complex" mechanization meant mechanization of all operations on specific crops. It should not be interpreted to mean total mechanization of all work, for the planned amount of mechanical power would have been too short for this. The quoted resolution indeed prescribed an increase in the output of horse-drawn machinery, especially for hauling.

4th Plan Period.—At the end of 1946 Soviet agriculture had about three-fourths of the prewar tractor power.[9] Most tractors, however, were obsolete by American standards, and some were in no condition to be used. By 1950 every tractor produced before the USSR's entrance into the war will be obsolete in the sense stated. Tractor production and imports (Lend-Lease shipments) were small during the war and through 1945. Almost all of these tractors will likewise be obsolete by the end of 1950.

The 4th Plan provides for the delivery to agriculture of 325,000 tractors with around 10 million horsepower in 1946–50. Since the new territories will be much more mechanized than before the war, the pre-1939 territory will receive considerably less power in tractors than it had before the war. If the USSR would return to normal discarding, the old territory would have fewer tractors in 1950 than in 1940. But such a rate of discarding is not scheduled. By retaining a great number of obsolete tractors, the total tractor power on farms of the old territory may in 1950 turn out considerably in excess of prewar, provided the production plan is fulfilled and not too many

[7] There were practically no combines in the new territories, and it is unlikely that the percentage of combined grain was computed for the enlarged territory—a procedure which would have lowered the figure.

[8] Resolution of the XVIIIth Party Congress.

[9] Statement based on evidence in A. A. Andreev, "On Measures to Raise Agriculture in the Postwar Period": Report to the Central Committee of the Party, February 1947 (see *Socialist Agriculture*, Mar. 7, 1947).

tractors are exported. This of course implies continuance of the high maintenance costs associated with the use of obsolete machinery.

The 4th Plan specifies that 90 percent of the plowing and 70 percent of the sowing be done by tractor in 1950.[10] These proportions are greater than were reached by the Union in 1941 within the boundaries of 1938, yet they are scheduled for the expanded territory.

The USSR had 49,000 fewer combines after the war than before,[11] and they were in even worse shape than the tractors. It is planned to produce 174,300 combines between 1946 and 1950.[12] Since the Union had more combines in 1940 (182,000) than are scheduled for production, the enlarged Union in 1950 will have fewer combines that are not obsolete than it had in 1940. Yet 55 percent of the total grain area of the enlarged territory is to be harvested with combines in 1950, according to the plan, as against 43 percent so harvested within the old boundaries in 1940.

TOTAL POWER

Total power in agriculture in the USSR and the United States. —Although the rapidity of mechanization of Soviet agriculture in the 'thirties was phenomenal, the assertion that this agriculture became the most mechanized in the world was false.[13] Before the war, it is true, a somewhat smaller proportion of the land was plowed with tractors and a somewhat smaller proportion of small-grain acreage was harvested with the combine in the United States than in the USSR. But the mechanization of Soviet agriculture in general is limited to a few operations, while American agriculture is, to a large extent, mechanized through and through, in the field and around the house. Feed cut

[10] S. F. Demidov, *Development of Agriculture in the Postwar Five-Year Period* (Moscow, 1946), p. 163.

[11] The figure is given in *Socialist Agriculture* (Feb. 3, 1947) "as taken away or destroyed by the Germans." But this is merely a formula. Every machine which broke down somewhere in Siberia was certainly included.

[12] N. Anisimov, *Agriculture in the New Stalin Five-Year Period* (Moscow, 1946), p. 75.

[13] Stalin said at the XVIIIth Party Congress: "Our agriculture . . . . is . . . . larger-scale and more mechanized . . . . than the agriculture of any other country." The statement has been repeated time and again. Indeed, no other would be permitted.

and blown into the silo by machine, water piped into barns, factory-mixed fertilizers and feeds, truck transportation on, from, and to the farm—all are aspects of mechanization.

Moreover, the whole problem of mechanization of agriculture is incorrectly handled in the USSR. There certainly is a great deal of difference between mechanical and animal power, and in most operations the former is increasingly improving its advantages. Yet the Soviet practice of putting mechanical work vis-à-vis the work of animals and men is unwarranted. From the standpoint of humanity, the replacement of human labor by any other power, even animal power, is vastly more important than the replacement of animal power by mechanical power. There is no point in making a religion of the machine. Man is the god. Actually, when it comes to measuring power, Soviet experts add up all power available to agriculture, mechanical and animal, in the same way as in the United States.[14] When such computation is made, it is found that in agricultural draft power the USSR was not only far behind the United States before the war, but behind many other countries as well.

About 45 million persons were gainfully employed in Soviet agriculture in 1937, of which about half were men, as against 10,789,000 persons,[15] mostly men, in the United States. Table 39 shows that before the war American agriculture had around 75 percent more draft power (tractors and animals combined) than Soviet agriculture. Thus, per adult man, the United States had over three times as much draft power as the USSR, and approximately six times as much per person engaged in agriculture. The superiority of American agriculture was vast in trucks, automobiles, and electricity. The USSR was ahead only in the power available in the motors of the combines. In 1940 the Soviet Union had 182,000 combines and the United States 190,000, but the American machines totaled much less power than the Soviet.[16] The area in crops which can be harvested with the combine is, however, much smaller in the United States than in the USSR.

[14] See, for example, *Kolkhozy in the 2d Stalin Five-Year Period*, Gosplan (Moscow, 1939), p. 29.

[15] Yearly average; in July, 12,511,000 were employed.

[16] On the size of American combines, see A. P. Brodell and J. W. Birkhead, *Age and Size of Principal Farm Machines* (U.S. Dept. Agr., 1943), p. 7.

The productivity per person in agriculture in the United States is about 4.5 times as great as in the USSR (see pp. 441–46). One reason for this disparity is the smaller amount of power per man and the lesser degree of mechanization in Soviet agriculture. Those who insist that Soviet agriculture is more mechanized than that of the United States are, in effect, putting the efficiency of Soviet agricultural workers in an even worse light than it actually is.

TABLE 39.—ANIMAL AND MECHANICAL POWER IN AGRICULTURE, USSR AND UNITED STATES*

Source of power	Number (*thousands*)		Horsepower (*million*)	
	USSR 1938	U.S. 1940	USSR 1938	U.S. 1940
Horses	11,000	12,198[a]	8.2[b]	12.2[a]
Oxen	3,800	.....	1.9[b]	....
Tractors	483	1,567	9.3	22.0[c]
Combines	154	190	4.3[d]	?
Trucks	196	1,047	5.3	41.9
Automobiles	Few	4,144		66.3[e]
Stationary engines				
Steam	89	10	2.5	.3
Internal combustion		1,788		10.6
Electricity				
Individual plants	...	179		.5
Central stations	...	1,872		5.6
Windmills	...	650		.2

* Official sources for the USSR. American data from the Division of Farm Power and Machinery, U.S. Dept. of Agriculture.

[a] Including mules, converted to horses. The total was 13 million, if a mule is considered equal to a horse.

[b] The Russian horse being small, it is counted in Russia as 0.75 horsepower, while an ox is counted as 0.5 horsepower.

[c] Sixty percent of belt power.

[d] Computed from data in *Socialist Construction USSR, 1933–38*, pp. 28 and 88.

[e] Forty percent of the power of the automobiles; the balance is assumed to be used for the personal needs of the owners.

Changes in amount of available power.—The results of the trend toward mechanization, in terms of total power (mechanical and animal) available to agriculture, were quite different in the USSR and the United States. Mechanization greatly enlarged total power on American farms. Although the number of horses and mules over two years old declined by 9.4 million between 1920 and 1940, the deficit was largely offset by new tractor

power alone.[17] Almost the entire increase in other sources of mechanical power came as an addition.

In the USSR all farm power, animal and mechanical, declined by almost 30 percent between 1928 and 1933 (Table 40). The

TABLE 40.—CHANGES IN FARM POWER IN THE USSR, 1927–38*

Year	Animal power (*million head*)			Mechanical power				Total power in terms of horses (*million*)	Mechanical power in percent of total
	Work horses	Other	Total in terms of horses	Tractors (*million h.p.*)	Combines (*thousand*)	Trucks (*thousand*)	Total (*million h.p.*)		
1927 ...	23.2	6.9	27.8	0.3	...	...	0.4	28.2	2
1928 ...	24.3	6.9	28.9	0.4	...	...	0.5	29.4	2
1929 ...	25.2	6.1	29.2	0.4	...	...	0.5	29.7	2
1930 ...	22.4	4.9	25.7	1.0	2	2	1.3	27.0	6
1931 ...	19.5	3.1	21.5	1.9	6	5	2.7	24.2	12
1932 ...	16.2	2.6	18.1	2.2	14	12	3.2	21.3	17
1933 ...	14.2	2.4	15.8	3.2	24	23	4.8	20.6	26
1934 ...	12.9	2.9	14.9	4.5	31	31	6.7	21.6	34
1935 ...	12.0	2.9	14.0	6.5	49	41	9.6	23.6	44
1936 ...	11.4	3.4	13.7	8.0	93	72[a]	12.3	26.0	50
1937 ...	11.0	3.5	13.3	8.4	123	103	13.6	26.9	54
1938 ...	11.0	3.8	13.6	9.3	154	196	15.9	29.5	57

* Data from various official sources. Data on animal power for the middle of the year; data for mechanical power for the end of the year. The numbers of horses and oxen at the middle of 1937 and 1938 estimated on the basis of data for January 1. Horsepower in tractors always drawbar horsepower.

One ox was considered equivalent to two-thirds of a horse, as in official computations. One combine and truck were assumed to be each equivalent to one-half of a tractor with 15 horsepower; several times as much power is assumed for these machines in the official computations of the USSR (see Table 39). A combine is used at most for one-fifth as many hours per year as a tractor. The relation here accepted is probably still too favorable for the combines, especially because part of them in later years did not have their own motors. Farm trucks also are used much less than tractors. As in the official statistics, one work horse is assumed to be equivalent to 0.75 of a rated drawbar horsepower of a tractor, thus making one tractor with 15 horsepower equivalent to 20 horses.

Sources of mechanical power, other than tractors, combines, and trucks, are not included. According to official computations, their power in 1938 amounted to 8.2 percent of the total mechanical power as against 2.6 percent in 1928 (*Socialist Construction USSR, 1933–38*, p. 21). The percentages would be smaller if the small annual utilization of these sources of power were considered.

[a] Approximate.

situation was aggravated by the drive toward larger acreages. Only about 60 percent as much power was available per 100 acres in 1932 and 1933 as in 1928. The shortage was consid-

[17] Brodell and Birkhead (*op. cit.*, p. 6) computed the additional power in tractors at 6.5 million work-animal units by assuming that one tractor on the average replaced five horses.

erably relieved in succeeding years, but the draft-power situation remained tight.

According to Table 40, by 1938 the big decline in animal power had been more than offset by mechanical power, the excess amounting to 7.5 percent. This excess was boosted substantially by enlarged annual utilization of animal power[18] and the large annual utilization of tractors. On the other hand, however, the requirements for draft power increased materially after 1928 because of the expansion of cropped plowland, the disproportionate increase in the area of such crops as cotton and sugar beets which require large use of power, additional work per hectare as a result of such practices as deeper plowing and more frequent harrowing, the replacement of human labor by mechanical or animal power, the enforcement of deliveries to the state at the peak of draft-power requirements, and so on. The timeliness of operations and the availability of power reserves could have increased only moderately, and even to that extent only because a considerable part of the tractor work was done at night.

Postwar prospects.—Soviet agriculture had little over 60 percent of its prewar draft power at the end of 1945 (excluding cows, the use of which for draft work, begun during the war, has continued)—and this without allowing for the obsolescence of practically every tractor. The total draft power that will be available for operations on the 1950 crops may statistically exceed the prewar level, but it will be greatly inferior in quality.

Tractor power has already been discussed. There were only 10.5 million horses of all ages at the end of 1945 as against 21.3 million in the same territory at the end of 1940. In view of the great shortage of draft power in the coming few years, the assumed yearly increase in horses of about 8 percent (46 percent in five years) is overoptimistic. Yet only about half of the deficit in horses is expected to be made up by the end of 1950. Moreover, an unusually large proportion of the horses will consist of young stock in 1950. A scheduled increase in the number

[18] S. Matskevich ("Power Balance in Soviet Agriculture," *Planned Economy*, December 1940, p. 55) asserted that the diminished animal power did even more work in 1938 than the total of 1928, but he failed to substantiate his assertion with figures, although on other matters he has an abundance of data.

of oxen is mentioned in the 4th Plan, but no figures are given. The planned large increase in the use of electrical power (see p. 475) will help little to compensate for the reduction in serviceable tractors and the much smaller amount of horsepower.

THE TRACTOR

TRACTOR TYPES[19]

Early types.—Partly because of the smallness of individual peasant farms and of the machine-lending points serving them (see page 270), but chiefly on the strength of poor advice, the USSR started out with tractors of below-optimum size for the work expected of them. Most imported tractors were of the two-plow size, including many Fordsons already out of date. A reproduction of the Fordson, the Putilovets, was the only Soviet model manufactured at first. Production of this type began in 1927 and continued through 1932. On January 1, 1930, almost three-fourths of all Soviet tractors were of the two-plow type, and three-quarters of these were original Fordsons or Putilovetses.

Standard wheel tractor.—In 1930 a replica of the 15/30 four-wheel three-plow tractor of the International Harvester Company of Chicago was first produced. This model, frequently referred to in the USSR as the International, was soon being turned out simultaneously in Stalingrad (STZ) and Kharkov (KhTZ) and for years remained the standard Soviet tractor. While its production was discontinued in 1937, its dominant role on farms had not been broken by 1947.

Crawlers.—The International was not replaced by any other four-wheel tractor. Long before it was discontinued the decision had been made to change over entirely to crawlers (track-laying or caterpillar type), except for a small three-wheel tractor adapted to cultivating. The abandonment of the four-wheel tractor was certainly ill-advised, especially after the competitive power of such tractors was strengthened by replacing the steel wheels by rubber-tired wheels.

[19] A frequently occurring source of confusion is the difference in type of horsepower in which the power of tractors is expressed in the USSR and the United States. In the USSR, this power is rated drawbar horsepower, or power on the hook, even if not specified as such. In the United States, power expressed in one figure and not specified as drawbar usually is belt power.

The change to crawlers was largely a facet of the gigantomania pervading all Soviet economic activity. One state grain factory was and still is called "Gigant." The same attitude was taken toward farm machinery. Having for years used the two-plow tractor in areas for which the three-plow tractor was the smallest appropriate size, the Soviets eyed with enthusiasm the largest crawlers existing abroad. In 1933 the tractor factory in Chelyabinsk went into operation, producing the Stalinets 48/60, a copy of the Caterpillar 60 of the Caterpillar Company in Peoria. Since 1938 part of the Stalinets have been diesel-powered (Stalinets 50/65).

The huge crawler came late. By the time the Stalinets were ready, other countries had learned that the large crawler of about 50 horsepower on the hook can rarely be utilized to full advantage in agriculture, even in the so-called wheat factories, and the trend was away from these even in the USSR. A full load of such a tractor implies a width of some 135 feet in harrowing, of 75 feet in disking, of 65 feet in seeding.[20] A width of 40 feet is covered when this tractor is used for harvesting with the combine (two 20-foot combines), even if the combines are on steel wheels.[21] Harvesting with two large combines, for example, inevitably involves many delays. Whatever saving is effected by the use of one large tractor to pull the two combines in place of a smaller tractor for each combine, is not likely to offset the cost of these delays. Large crawlers (or, for that matter, crawlers in general) are not economically usable in numerous operations that require little power, such as binding grain and all haying operations. It is interesting to note that the Campbell Farming Corporation, directed by Thomas Campbell, one of the advisers on Soviet mechanization, never changed to track-laying machines of any size.[22]

After the International was discontinued, the Stalingrad and Kharkov factories shifted to the production of the NATI, a crawler about a third smaller than the Stalinets, operated on

[20] B. Svirshchevskii, "Combination of Operations in Agriculture," *Socialist Agriculture*, September 1945, p. 48.

[21] Combines nowadays are mostly equipped with rubber tires, a change which implies a considerable saving in power needed for moving the machine.

[22] T. D. Campbell, "The American Farm Problem," *Mechanical Engineering*, October 1928, L, 745–52, and personal information from Mr. Campbell.

either kerosene or solid fuel.[23] The addition of the smaller crawler was certainly in line with experience abroad, notably in the United States, where crawlers with 30 to 35 horsepower on the hook gradually became the largest used in farming.[24] But the NATI had important technical shortcomings.[25] Moreover, too much emphasis was put on the large Stalinets even after the smaller NATI had become available, and more on crawlers in general than was advisable in view of experience in the country that developed the tractor.[26]

The Chelyabinsk factory—only a small part of it—has now been turned to the production of a still larger tractor, the Stalinets 80. Diesel-powered, this has five speeds. The 1946 output was expected to amount to 3,000 tractors, but fewer than 1,000 were produced. It is hardly necessary to say that this tractor is much too big for agriculture. Not gigantomania, but military considerations, are probably behind its production; the factory is apparently continuing the manufacture of tanks, and the large Stalinets fits better in its production schedules.

Row-crop tractor.—The row-crop tractor was first put on the market in the United States in 1925. Soviet production started in 1934 but did not get well under way until 1935. The Soviet row-crop tractor, called Universal, is a steel-wheel tractor, a reproduction of the Farmall of the International Harvester Company.

An article by two Soviet experts mentioned row-crop crawlers as due for construction in the 3d Plan Period.[27] This type certainly did not prove efficient in this function outside the USSR, and all hope of establishing it was lost after its successful competitor, the three-wheel tractor, was equipped with rubber tires.

[23] Mostly wood, occasionally charcoal, and possibly brown coal.

[24] Even these are used only to a small extent in American agriculture; and this is by no means solely because of the insufficient size of the farms, as the Soviets want to believe.

[25] S. Matskevich, "On Types of Tractors in Agriculture of USSR," *Socialist Agriculture*, December 1943, p. 6.

[26] On the most recent developments in machinery construction, see *Socialist Agriculture*, Apr. 12, 1947. The NATI with a diesel motor was in early prospect in April 1947; and a new diesel-powered crawler smaller than the NATI, Kirovets 35, was being tested in the new Lipetsk factory.

[27] M. Sivachenko and V. Polyachenko, "Complete Mechanization of Agriculture in the 3d Five-Year Period," *Socialist Agriculture*, June 1940, p. 73.

The whole line.—To summarize, the USSR was producing the following tractor types before the war:

Type	Rated drawbar horsepower
Crawlers	
Stalinets with a carburetor engine	48
Stalinets with a diesel motor	50
Stalinets operated on solid fuel	35
NATI operated on kerosene	32
NATI operated on solid fuel	27
Row-crop: Universal	10

Imports of tractors were discontinued after 1932, and Soviet agriculture had to be satisfied with the small line of domestically produced tractors. The requirements of agriculture of so vast a country could not be satisfactorily served by only three different tractor types.

The distribution by type of tractors on farms at the end of 1938 is shown in the following tabulation:[28]

Type	Number		Horsepower	
	1,000 units	Percent of total	1,000 units	Percent of total
International	339.8	70.3	5,089.9	55.0
Crawlers	77.0	15.9	3,498.8	37.8
Row-crop	66.7	13.8	667.5	7.2
Total	483.5	100.0	9,256.2	100.0

More than one-third of the tractor power was represented by crawlers—a larger proportion than can be found in any other country of the world. Moreover, this proportion was scheduled to increase rapidly during the 3d Plan Period. With the intensive use of tractors in the USSR, most of the standard wheel-type tractors would have become obsolete by the end of the 3d Plan Period, and the tractors would have consisted almost exclusively of large and medium crawlers and row-crop wheel tractors. If the proportion of all tractor power in crawlers remained unchanged in 1939 and 1940, it was because the goals for the output of these tractors were not fulfilled. Similarly, the International is still in wide use in the USSR only because the great

[28] *Socialist Agriculture USSR, 1938*, p. 18.

oss of tractors in the war compelled the continuing use of obsoete machines.

In 1938, one-third of the number of newly produced tractors was of the row-crop type, while two-thirds were crawlers; but in terms of power, the row-crop tractors amounted to less than 10 percent.[29] About one-third of the newly constructed crawlers by number and over 40 percent by power consisted of the large Stalinets. On January 1, 1941, the Stalinets still had more than two-thirds of the power of all crawlers.[30]

The tractors scheduled for production in the 4th Plan Period are to average above 30 drawbar horsepower. The tractors produced in 1938 had, on the average, almost exactly 30 horsepower. Thus, the trend toward larger tractors continues.

FUEL PROBLEM

One feature of the fuel problem merits special consideration. The government charges the state farms, state-owned MTS, and kolkhozy very high prices for kerosene. By the order of June 29, 1933, a price of 700 and 800 rubles per ton (according to zone) was established. The price of kerosene in 1928 was 55 rubles in the Ukraine,[31] only about one-thirteenth of the new price. Although an inflation was in progress, nothing justifying such a price increase occurred in the money market. Indeed the new price of kerosene was almost ten times the price paid by the government to the peasant for wheat.[32]

Waste of motor fuel was given as the reason for the exorbitant price charged for kerosene. While the accusation was correct, the measure itself certainly had adverse implications. The very

[29] The scarcity of small tractors on farms was a big handicap in performing operations requiring little power. Since even large tractors were not too numerous and could be used in operations in which their power could be utilized more fully, the operations requiring little power were mostly left to be performed by animals or men. These, however, were not always available in the required numbers and at the proper time. The unfavorable effects of this situation are discussed below (pp. 468–69).

[30] S. Matskevich in *Socialist Agriculture*, December 1943, p. 5. The disproportion in tractor types is obvious from the fact that for the year 1940 the row-crop tractors averaged 35.4 hectares of standard plowing per drawbar horsepower and the Internationals 29.1 hectares, while the crawlers averaged only 21.4 to 27.2 hectares (*ibid.*, p. 8).

[31] Implied in A. M. Markevich, *Inter-Village Machine-Tractor Stations*, Gosplan (Moscow, 1929), p. 100.

[32] At a price of a dollar per bushel of wheat and ten cents per gallon of kerosene in the United States, wheat cost about 20 percent more than kerosene per unit of weight. Thus the ratio between the prices of wheat and kerosene in the USSR was made about twelve times as unfavorable to agriculture as in the United States.

high price of kerosene made the saving attained by the use of diesel engines seem much greater than it really is. This was of less moment, for the shift to the diesel engine was certainly desirable. But the high price charged for liquid fuel made the tractor operated on solid fuel appear economical,[33] and the effect of this change is of doubtful real value.

The tractor expends a substantial portion of the energy developed by its engine in propelling itself. It is therefore ill-adapted to a fuel that inevitably reduces the power developed by the engine. As shown by the tabulation on page 463, the NATI operated on solid fuel has a rated power 15.6 percent smaller than when operated on kerosene. The corresponding reduction in the power of the Stalinets is even equivalent to 27 percent. The required normal performances per shift are reduced by about 25 percent for the same makes of tractors when they are operated on solid rather than liquid fuel.[34]

With anything like a normal price relation between liquid and solid fuel, the saving effected by use of the latter cannot justify so great a reduction in performance. It seems safe to assume that the use of tractors operated on solid fuel should be restricted to exceptional conditions, such as operations deep in the northern forests. As for solid fuels that can be liquefied, it would be more practicable to convert them at the place of extraction and transport and later use them in tractors in that form.

The inadvisability of the shift to solid fuel for tractors is particularly great in the USSR. While in other countries the question is merely one of costs, in the USSR, with its serious shortage of capital and specifically of farm power, the equipment of a certain number of tractors with engines operated on solid rather than liquid fuel means correspondingly less power in agriculture.[35]

RUBBER-TIRED TRACTORS

The fact that no rubber tires have as yet been used on farm tractors in the USSR must be due to shortage of foreign exchange

[33] Such a conclusion is reached, for example, by A. Sokolov, "Utilization of Local Fuel for Tractors," *Socialist Agriculture*, December 1913, p. 17.

[34] See the orders of the government and Party dated Mar. 8, 1939, and Mar. 8, 1940.

[35] It is noteworthy that production of tractors operated on solid fuel started in 1936, before that of diesel tractors. (*Socialist Reconstruction of Agriculture*, December 1938, p. 64.)

for the imports of raw rubber. Soviet efforts to grow native rubber plants, and the moderate results, are discussed elsewhere (p. 586). The great progress in the production of synthetic rubber in other countries did not escape the attention of the Soviet government. After this industry has been domesticated the USSR may turn to rubber-tired tractors and agricultural machinery in general. Then their ideas as to the best size of tractors will have to be revised. However, the 4th Plan does not mention rubber-tired tractors.[36]

TRACTOR PERFORMANCES

All tractor work in the Soviet Union is expressed in hectares of "standard plowing." Typically, this operation is represented by the turning of stubble land for small grains, though the term applies to any plowing except sod breaking and the deep plowing (over 11 inches) required by sugar beets and certain other crops.

The official computation for MTS indicates an average of 488 hectares of standard plowing (including threshing in terms of the same unit) per 15-horsepower tractor in 1937;[37] it was 411 hectares in 1940.[38] The average prescribed normal performance of standard plowing is about 3.8 hectares per shift, which may average about ten hours of actual work, but the norms are not always fulfilled. Thus in 1940 the tractors averaged about 110 shifts or 1,100 hours. Some MTS registered performances exceeding 850 hectares of standard plowing per 15-horsepower tractor, or not less than 225 shifts per year.

These performances possibly exceed anything observed in any other country. Yet most tractors in the USSR are used in areas growing small grains exclusively, and often nothing but spring-sown small grains, where the opportunity for steady utilization of the sources of power is much less than in areas of diversified farming.

Soviet writers are very proud of the prodigious performances of their tractors. Hardly an author who touches upon the subject neglects to emphasize that the yearly performance per tractor

[36] P. Nikitin ("Machine Output and Development of Techniques in the New Five-Year Plan," *Planned Economy*, July-August 1946, p. 26) said that agriculture will receive wheel tractors on rubber tires. But he gave no details.

[37] *Socialist Agriculture USSR, 1938*, p. 53.

[38] Andreev, *op. cit.*

in the USSR is several times as large as in the United States. Laptev, for example, asserted that while 470 hectares of standard plowing were done per tractor by the MTS in 1937, the average was only 100 hectares in the United States.[39] Moreover, performance per tractor has a function in the USSR other than giving proof of the superiority of Soviet agricultural practices. The hectarage of standard plowing per tractor has become the accepted measure for comparing the efficiency of one MTS with another,[40] one tractor driver with another. Indeed, progress in agriculture from one year to another is measured in the number of hectares plowed per tractor.

Under the conditions prevailing in the Soviet Union, it is a real achievement to keep the tractors in good repair and to plan the work ahead so as to get the maximum number of hours out of the insufficient number of machines. But the system of measuring achievement in hectares of standard plowing is very crude. The endless praise of those who succeed in attaining the greatest performances per tractor results in work being performed with tractors that is either useless or of little value at the time it is done, or, if needed and timely, is performed hastily and therefore badly. On the other hand, important work is left undone because its equivalent in standard plowing is less favorable than that of some less urgent operation. There is vast opportunity for such practices, especially in view of the great dependence of the kolkhoz administration on the management of the MTS. Evidences of work poorly done or not done at all are abundant.

Poor work.—Complaints of poor work, such as uneven and shallow plowing or great losses from cutting too high with the combine never ceased. Delayed work, however, has been most conspicuous and most harmful. In the first years of the socialization drive, seeding of small grain lasted well into July, and harvesting and the first cutting of hay were so delayed that millions of hectares of grain and other sown crops were lost under snow, and even larger acreages of meadows were uncut and unused. As more power became available such disastrous delays

[39] I. Laptev, *Soviet Peasantry* (Moscow, 1939), p. 142.

[40] See, for example, *Socialist Agriculture USSR, 1938*, p. 53, Table 59, showing the hectarage of standard plowing per tractor in the MTS that distinguished themselves in 1933 and 1937.

became history, but timeliness of operations remained a vexing problem. Shortly before the last war, when the damage of the early years of the collectivization drive had been more or less repaired, much land was still plowed when not in the proper condition and grain was harvested too early or too late. Tractors were used at night in such operations as seeding or combine harvesting, where the quality of work would inevitably suffer even with better operators than were available in the USSR.

Work not done.—Specifically with reference to the operations which were left entirely unperformed, attention is drawn to Table 38 (p. 452). It is typical of the Soviet manner of presenting statistical data. While the table was entitled "Mechanization of the Principal Operations in Agriculture," it omitted all operations in which only a small degree of mechanization had been attained. The cultivation of row crops and especially all operations in hay were the principal cases of this sort.

In the kolkhozy investigated in 1937, cultivating in four important row crops was distributed as follows among the various sources of power (percent of total for each crop):[41]

Crop	Tractor	Horse	Hand
Corn	35	20	45
Sunflower	27	22	51
Cotton (unirrigated)	40	9	51
Sugar beets	35	9	56

The participation of the tractor in cultivation was actually even smaller than is indicated by these figures. In cultivating corn, for example, an average of less than one-tenth of an hour of tractor work was performed per hectare, compared with 5.91 man-days. The corresponding relationship for sugar beets was 0.18 tractor hour against 43.5 man-days, and for low-yielding unirrigated cotton about 0.25 tractor hour against 21.2 man-days.

In spite of the notable increase in mechanized power from 1933 to 1938, the number of tractor hay mowers increased only from 24,900 to 27,900. So small a number for a hay area of some 65 million hectares is of course negligible, and most trac-

[41] *Productivity and Utilization of Labor in Kolkhozy in the 2d Five-Year Period*, Gosplan (Moscow and Leningrad, 1939), pp. 34–38 and 44–47.

tor hay mowers were found in the sovkhozy. The MTS had few of them. Only a fraction of the kolkhoz hay acreage was cut by tractor power; the plan for the mowing of kolkhoz hay in 1940 provided only for 8.8 percent of the total to be harvested by tractors, according to Grishaev.[42] He added, moreover, "The plans for hay mowing with tractors remain regularly unfulfilled." Of the 1938 plan, only 40 percent was fulfilled. According to Matskevich, tractors in 1938 participated in haying and the harvesting of flax and potatoes to the extent of less than 1 percent.[43]

The number of horse-drawn mowers was also very inadequate,[44] and a sufficient number of horses could rarely be mobilized in the short span of time in which haying could be properly done. Much hay was therefore harvested by hand, most of the haying was greatly delayed, and part remained untouched.

In an order of the government and Party of July 8, 1939 it was stated that large acreages of meadows remained uncut, or the cutting was delayed because of machinery shortage, and the hay had to be harvested by hand. The organization of a small number of special detachments of the MTS (500 in 1940 and 450 in 1941) in areas with large hay acreages was prescribed by the order, and the speedy production of a sizable number of machines used in haying was also ordered. Characteristically, the list of machines included 2,000 tractor mowers of much larger size than the largest mowers used elsewhere,[45] in addition to 50,000 horse-drawn mowers. The usual tractor mowers do not fit into an organization in which the cost of kerosene is artificially inflated and whose tractor drivers are paid perhaps three times as much as horse drivers.

Relation between tractor and man.—Soviet writers are right, of course, when they insist that the large size of the individual enterprise (sovkhoz, kolkhoz, MTS) permits a much larger

[42] M. Grishaev, "The Organization of Machine-Mowing Detachments," *Socialist Agriculture*, April 1940, p. 85.

[43] S. Matskevich in *Planned Economy*, December 1940, p. 63.

[44] They increased from 462,900 in 1933 to 543,100 in 1938, but this increase only made up for the decline that occurred between 1928 and 1933. From 1938 to 1940 horse-drawn mowers again declined to 484,000; the latter figure is from *Socialist Agriculture*, Mar. 26, 1946.

[45] Cutting width, 30 feet; weight, 3,474 lbs.; productivity, 11¼ acres per hour at a speed of 2.8 miles. See V. M. Barzykin, *Mechanization of Farming* (Moscow, 1946), p. 150.

yearly performance per tractor than in the United States. If all farms in this country were of optimum size, fewer tractors would be used and each one would average a greater number of hours per year. But the large size of Soviet farms is only partly responsible for the greater performance per tractor. The large difference in wage levels is the principal reason.

In a country like the USSR where a tractor costs a fortune,[46] the profitable balance between tractor (and animal) power and human labor calls for the largest possible utilization of the tractors (and horses), even if labor is wasted. The mass slaughter of horses in the early 'thirties merely aggravated this situation. The greater performance per tractor in the USSR is to a large extent inevitable, a corollary of the very low cost of labor. The reverse holds in the United States. Under these circumstances, the greater performance per tractor does not warrant the degree of pride displayed in the USSR.

A tractor, a truck, and a team of horses as well are frequently found on American one-man farms. They are used one at a time. Each tractor, truck, or team has its separate driver in the USSR. Moreover, two men frequently ride on each tractor to insure continuous work. A brigadier, assistant brigadier, and a fuel controller serve each small group of tractors (see page 283). In addition, many other workers are sent out to the field for subsidiary operations, such as hauling fuel and water, and unloading the combine, with the same purpose of preventing the smallest possible delay of machinery. This squandering of labor to insure uninterrupted work of the machinery has been greatly overdone in the USSR, partly because of the extreme shortage of horses and the elevation of the tractor to something divine, but chiefly because the labor of the kolkhoz members is so cheap (see pp. 685 ff.).

Yanyushkin describes the organization of harvesting with the combine in a model kolkhoz.[47] In addition to the tractor drivers and combine operators and their assistants, there were put to

[46] Around 1928, when comparable prices still existed, a three-plow tractor cost about 2,500 rubles. The average yearly income of the peasantry was around 400 rubles per household.

[47] M. Yanyushkin, "Squad Organization of Labor in Kolkhoz Brigades," *Socialist Agriculture*, March 1940, pp. 58–59.

work with each combine (operated in two shifts) seven squads consisting of 56 kolkhoz members for various tasks such as cutting corners, sacking the grain, picking up, loading, and unloading the sacks, cleaning and drying the grain, and saving the straw and chaff. This crew of over 60 persons harvested some 75 acres in 24 hours, an acre and a quarter per person when the shift norm was fulfilled. That did not include transportation of grain and straw from the field.

Combining in two shifts implies work during part of the night. All-night combining also is not uncommon. Twenty-four-hour work of tractors in all other operations is standard in the USSR or at least is requested. The inadaptability of certain operations to night work and the general inferiority of all night work are disregarded. The hardship for the men could never be mentioned in the USSR.

COST OF TRACTOR WORK

Soviet literature on the use of tractors is abundant and ever expanding. Yet the outstanding problem of the profitableness of tractor work, relative to work performed by animals and men in different operations and areas, is rarely touched. The only thing mentioned over and over again is the huge saving of labor attained by the use of tractors, according to official computations (see p. 416, especially Table 29).

The present writer has devoted a great deal of study to the relative profitableness of tractor and animal power under various conditions.[48] That work was, to a considerable extent, prompted by a desire to appraise the consequences of the introduction of the tractor into the USSR. The complicated problem can be discussed only broadly here.

The wage level is the most important single factor in the competition of tractors and horses as farm draft power. The use of the tractor always implies a saving *of* labor and, if the wages of horse and tractor drivers are the same, an equal saving *on* labor. The higher the wage rate, the greater is the latter saving. Where tractor power is cheaper than animal power, the

[48] See, for example, his *Der Schlepper in der Landwirtschaft* (Berlin, 1932); *Research Methods on Farm Use of Tractors* (New York, 1938); and "Tractor versus Horse as a Source of Farm Power," *American Economic Review*, December 1935, XXV, 708–23.

saving of labor is an additional advantage. There are, however, many operations, occasions, and regions in which the saving on labor attained by the use of tractors is their only advantage and, indeed, many in which the tractor power itself is more expensive than animal power, but the added expense is more than offset by the saving on labor.

A glance at the distribution of tractors throughout the world at once discloses a strong direct correlation between the wage rate and the use of tractors. The United States, Canada, Australia, and Great Britain have wages ranking among the highest, and use the greatest number of tractors. On the other hand, in the Danube Basin, which is as favorable for tractors as most other areas, they are little used, and in India and China they are virtually unknown. The wage level is particularly important as a factor in the tractor's competition with animal power because it operates not only directly by determining the attainable saving in labor but also indirectly by tending to create other conditions which likewise favor tractors.

The length of time that any power can be used per year, and the size of the farms, are other factors in the competition. The proportion of fixed costs in the total cost of power is higher for animal than tractor power. Because of this, the fewer the hours that power is used per year, the greater the advantage of the tractor. Any power is used fewer hours per year where small grains are grown exclusively than in mixed farming. This is the reason why the tractor was used first in the wheat areas in this country, and only later moved into other regions. Small-grain farming enjoys an additional advantage in that the nature of its operations permits the use of larger tractors which, per unit of horsepower, are operated more cheaply than small tractors. On the other hand, the operating costs of a team are in direct proportion to the number of horses.

The cost of feed relative to the cost of tractors, and especially of tractor fuel, has a considerable bearing on the competition of animal and mechanical power. The very low cost of feed in Australia is largely responsible for the fact that, although it is a country with high wage rates and a large acreage devoted solely to small grains, tractors have replaced horses to a smaller extent

than in the United States. But the effect of the cost of feed on the profitableness of the tractor should not be overestimated. The countries with the largest tractor utilization are those with low or moderate feed costs.

Outside of the USSR the size of farms is largely determined by the wage level. High wages are normally associated with bigger farms which permit the handling of large acreages by one man. Before the advent of the tractor, relatively large acreages were covered by one man driving large teams of horses in such countries.

Most of the factors affecting the competition of tractor and animal power, discussed above, favor the use of tractors in the greater part of the USSR. The operating units (sovkhozy, kolkhozy, MTS) are large, permitting the use of the largest machines, and small grains predominate in agricultural production. However, the wage level—the principal and generally decisive factor in the competition of tractor and animal power—operates against the tractor all over the Union, and with great force.

It is hardly possible to find a country in the world where farm labor works for so little remuneration as that of the regular kolkhozniki. It is claimed in the USSR that tractors and other machinery have released 10.9 million workers annually in collective farming. Even if this were true,[49] it amounts to little in terms of remuneration of the kolkhoz peasants for work on their collective farms. Moreover, the few million workers actually released annually by the use of machinery represent but a saving *of* labor. The saving *on* labor is much smaller, or very likely, is a negative value.

Tractor drivers are paid perhaps three times as much as horse drivers in collective farms. But the wheel tractors do no more than the work of two to three teams. In such operations as cultivating of row crops or haying, they do less work than two teams. Only crawlers, mainly the Stalinets, can bring about a saving *on* labor under such conditions.

The difference in the remuneration of tractor and horse drivers is ignored in Soviet discussions of the labor problem in

[49] The auxiliary workers and certain other categories were overlooked in making that computation (see p. 416).

connection with the tractor.[50] From the point of view of attaining the highest productivity in the country, the saving *of* labor is much more important than the saving *on* labor. But it is different from the point of view of those millions of kolkhoz members who are not so fortunate as to be tractor drivers or combine operators (see pp. 284–85 and 403–05).

Although the size of the farms of the USSR makes them well adapted to tractors, these can be used profitably only to a limited extent. This extent is only part, possibly a fraction, of their actual use, not only with the extremely low remuneration of the kolkhoz peasants, but also with the wage level which would prevail in a free Russian economy.

In regions with soil, climate, and crops similar to those of central and northern Russia, the tractor has no considerable place even for smoothing away the seasonal peaks of requirements for draft power—the principal role assigned to the tractor in such countries as Germany. The unfavorable situation of these areas with reference to tractor operations is obvious from the fact that, according to official computations, the average cost per hectare of standard plowing in 1939 was about 46 rubles in the non-Chernozem zone as against 30 rubles in the steppe areas.[51] The relatively high wages of the drivers also is a much greater burden in central and northern Russia than in the steppe areas, owing to the predominance of operations requiring little power that should be performed only by small tractors.

A specific point is worth mentioning. Since variable charges make up a smaller proportion of the total cost of animal than of tractor power, it is profitable to use animals and leave the tractor idle whenever there is not enough work for both. In the USSR the proportion of variable charges in the total cost of tractor power is exceptionally high, owing to the artificially enhanced price of fuel and the fact that no interest is charged. Yet no attention whatever is given to the fact that the animal power available should be utilized fully. None of the orders,

[50] See L. M. Zaltsman and others, *Organization of Socialist Farms* (Moscow, 1947), pp. 198–203. While the authors claimed to have made a special study of the economics of draft power, the different composition of the costs of animal and mechanical power escaped their attention.

[51] M. Moiseev, "On the System of Machinery in Agriculture," *Socialist Agriculture*, January 1941, p. 43.

rules, and regulations poured out on the sovkhozy and MTS mention this. The practice indeed is to use the tractors and leave the horses idle when there is not enough work for both.

RURAL ELECTRIFICATION

At the beginning of the Revolution, Lenin proclaimed electrification, including rural electrification, the key of the socialist reconstruction of the economy. Under the conditions then prevailing, with industry virtually at a standstill and agricultural production no more than three-fifths of the prewar level, the electrification goal could hardly have had any purpose other than maintenance of faith and hope. Little could be done in the first decade after the Revolution in the electrification of industry. Practically nothing was done during the whole interwar period toward rural electrification. The power of all rural electric stations amounted to only 65,900 kilowatts in 1940.

The 4th Plan proposes to raise this negligible amount to the imposing figure of 2,269,500 kilowatts. Although the situation at present is less unfavorable for rural electrification than it was immediately after the Revolution, the need for maintenance of faith and hope may be even larger now. All or most of the new electrical energy is expected to be produced in small local stations operated by water, or with local fuel such as peat, and even by wind. The supplies of oil and coal, except possibly brown coal, are too limited to permit their use for rural electrification.

The MTS will be the principal consumers of electrical energy. Among the operations to be electrified are mentioned threshing and milking. The latter does not fit well into the Soviet picture of extreme waste of human labor in agriculture.

GRAIN HARVESTING

THE COMBINE OUTSIDE THE USSR

The combined harvester-thresher for small grain, usable also for oil-flax, dry legumes, and similar seeds and grains, has been known in the Pacific States since the 1860's and in Australia since the 'nineties, but it did not become common before fairly

good farm tractors, large enough to pull combines, were developed early in the 'twenties.

Where conditions are favorable, the combine effects a great saving in harvesting costs. In the American hard-winter-wheat belt the rate for combining was slightly less than two dollars per acre in 1938,[52] while harvesting with binder and stationary thresher cost approximately five dollars. In addition, slightly higher yields can be obtained by the combine used in proper conditions.

The profitableness of combine harvesting is conditioned by a number of factors. The importance of farm size, climatic conditions, and value placed upon straw and chaff are discussed below. The wage level, perhaps the most decisive factor, operates much the same as in the case of the tractor, since the combine is essentially a labor-saving device: the higher the wage level, the greater the advantage of combine harvesting over other methods.

Acreage covered.—Before the 'twenties, combines were available only in large sizes (with 12-foot or greater cutting widths), were very expensive, and could be used to advantage only on large acreages. The particular adaptability of the combine to the climatic conditions of the areas where large farms predominated was the principal reason why they were made only in the large sizes. But the size of combines was gradually reduced. Since the middle 'thirties the bulk of the machines sold in the United States have been midgets, with 6-foot and even 5-foot cutting widths, receiving their power through a take-off from the tractor rather than from their own motors.[53] Both the cost of the machine and the minimum acreage on which it could be used profitably were greatly reduced by these innovations.

The moisture problem.—Harvest weather sufficiently dry to permit the shipping or binning of the threshed grain direct from the machine, without intermediate treatment, is essential for the combine's successful use. The moisture factor is so important in combining that, even in rainless weather, work is frequently not begun in the morning until the dew has dried, and is stopped

[52] A. P. Brodell and others, *Harvesting Small Grains and Utilization of Straw* (U.S. Dept. Agr., 1917), p. 19.

[53] Fully self-propelled combines were introduced more recently.

before sunset; and after rains the grain must be given more time to dry. The combine used in conjunction with artificial drying proves profitable only in special cases, such as rice harvesting in this country, in which even rice harvested with binder and stationary thresher is frequently dried artificially.

If the combine is used where the weather at harvest time cannot be relied upon, it is necessary to have alternative procedures in reserve, such as cutting with mower and threshing with combine from windrow, or cutting with binder and threshing with stationary thresher. A reserve drying capacity in elevators to which the grain is regularly shipped is also useful.

The Mediterranean climate is ideal for harvesting with the combine, and conditions like those in the United States hard-winter-wheat area are also favorable. Less adapted are conditions in the hard-spring-wheat belt of the United States and the Prairie Provinces. The spring grains predominating in those areas are harvested in August and early September when, with cooler temperatures prevailing, the grain is often not dry enough for combining. The delays after rains are longer than in the winter-wheat belt, and every day of delay brings the fall weather nearer. Early snow may cause the entire loss of a crop awaiting combining, while bound grain may be threshed in spite of snow.

The percentage distribution of grain acreages harvested by the different methods in California (Mediterranean climate), Kansas (hard-winter-wheat area), and North Dakota (hard-spring-wheat area) in 1945 shows clearly the effect of climatic conditions on the extent to which the combine proves useful:[54]

Harvesting methed	California	Kansas	North Dakota
Combined as standing grain	93.0	91.8	24.4
Combined from windrow	5.2	0.6	36.5
Threshed with stationary thresher, or cut and fed unthreshed	1.8	7.6	39.1

In 1938, before the exceptionally favorable war conditions gave a great stimulus to the use of the combine throughout the United States,[55] only 23 percent of the wheat in North Dakota was har-

[54] Brodell and others, *Harvesting Small Grains* . . . . , p. 3.

[55] The proportion of the wheat harvested by this method in all of the United States jumped from 49 percent in 1938 to 71 percent in 1945. See *Ibid.*, p. 5.

vested with the combine, as against 82 percent in Kansas and 95 percent in California.[56]

East of the North American wheat belts a large proportion of the small grain is grown as the earlier maturing winter grain. But small acreages in small grains on each farm, heavy precipitation, and the straw problem (see below) handicap the use of the combine. In the corn belt the spread of the combine was fostered by special advantages of combining for the easily shattering soybean. Farther east and in the southeast the combine is a later introduction. Only 6 percent of the wheat (practically all of it winter wheat) was harvested with the combine in Pennsylvania in 1938; war conditions raised the figure to 35 percent in 1945.[57]

Saving the straw and chaff.—Chaff and short straw are regularly lost in combining. Where they are valuable, this loss discourages use of the combine, especially since the saving of the recoverable straw makes a great cut in the money saving accrued from combine harvesting. Since the residuals of the oat crop are considerably more valuable than those of wheat, many farmers in this country use the combine for their wheat but harvest their oats with the binder. The following percentages of the 1945 wheat and oat crops harvested by combine, and of total recoverable straw left in the fields, in Illinois and Iowa,[58] suggest that little straw is saved where the combine is used or, conversely, the combine is little used where straw is to be saved:

Crop	Illinois	Iowa
Wheat		
Harvested from standing grain	80	47
Harvested from windrow	1	10
Wheat straw left in fields or otherwise not used	60	38
Oats		
Harvested from standing grain	45	18
Harvested from windrow	12	22
Oat straw left in fields or otherwise not used	32	14

The use of the combine is certainly impracticable where the lost chaff and short straw represent considerable value, where

[56] Brodell and others, *Harvesting Small Grains . . . .*, p. 5.
[57] *Ibid.*
[58] *Ibid.*, pp. 5, 9, 24, and 26.

the recoverable straw is needed, and where the grain also requires artificial drying.

Practically no combines are used in continental Europe outside of the USSR, although in many parts of it the climatic conditions are not unfavorable. All of southern Europe, in fact, has the Mediterranean climate, ideal for combining. The high value of the straw and the low level of wages provide the explanation.

THE COMBINE IN THE USSR

The combine in the USSR is used with even more thorough disregard for the experiences of the other countries than is the tractor. As in the case of the latter, the question is never raised—at least publicly—as to whether another harvesting method might be more practicable, or whether, because of some specific conditions, it would be advisable to postpone the introduction of the combine. Reverently, the combine is accepted as a universal blessing under all conditions. Actually behind that attitude, as in many instances, lie very practical considerations. No other harvesting method is as efficient as the combine in insuring to the government its large share of the crop in full and in reducing to a minimum the theft of grain, at least until the government has got its share. On a purely cost-accounting basis, however, the combine almost certainly yields no saving even in Russian areas climatically adapted to it.

The moisture problem.—The combine was first introduced in the south of the Union, where climatic conditions are favorable. Its use expanded rapidly over the entire country, even into regions extremely unadapted to its operation. Combining became the standard practice in western Siberia, a spring-wheat area climatically little suited to this harvesting method. Experience there has shown that early sowing of wheat gives smaller yields than medium-late sowing. Sown early in May, wheat is not ready for harvest before late August or early September, and combining faces hazards similar to those in western Canada. The combine was soon introduced into central and northern European Russia. Even the far north was not overlooked; in fact, a special combine called "Northern" had been constructed

for use in the north, but its output was quietly discontinued owing to technical shortcomings.[59]

The problem of the moisture in the grain to be combined is indeed approached in Russia quite unexpectedly. Koltsov wrote in the leading agricultural journal in 1938:[60] "The experience of past years showed that harvesting with the combines can start at 18 to 20 percent of moisture in the grain." This statement could have been made only because the practice of drying grain harvested by combine has become accepted as standard in the USSR. Available equipment for drying, however, was very inadequate and, for the most part, very primitive. According to an authoritative source,[61] the requirement for drying capacity was equivalent to about 40 percent of the crop—under conditions prevailing before the war, roughly 30 million tons of grain—depending on the season. All available dryers could, however, handle only about 3.3 million tons during the season. More than half of those dryers were primitive affairs made on the spot. A large part of the crop has to be dried by winnowing and "this leads . . . . to great losses of . . . . grain, especially in the eastern grain regions."[62] Part of the grain dried in primitive dryers certainly loses its germinating power, and bread grain also loses its breadmaking quality.[63] Such inadequate dryers are standard even on state farms.

The problem of labor input in combining wet grain cannot be discussed here; but the writer has studied it and is confident that frequently, and perhaps generally, more labor is used in combining wet grain than would be needed for harvesting the same grain with the binder.

It must have come as a shock to those who accepted the Soviet enthusiasm for the combine under all conditions that the 4th

[59] Barzykin, *op. cit.*, p. 246. Aside from this abortive attempt, the Soviet output of combines is limited to the 15-foot to 20-foot leviathans which, outside of the USSR, have become almost museum pieces except in the limited areas to which they are specifically adapted.

[60] V. Koltsov, "Some Problems of Combine-Harvesting," *Socialist Reconstruction of Agriculture*, May 1938, p. 129.

[61] M. Sivachenko and V. Polyachenko in *Socialist Agriculture*, June 1940, p. 84.

[62] *Ibid.*, p. 83. Note that the article was written in mid-1940; hence no considerable improvement could have been made before the war started.

[63] V. N. Ruchkin, *Drying of Grain in Kolkhozy* (Moscow, 1947). Real care is recommended by the author only for seed grain. Bread grain hardly can escape damage with the recommended drying practices.

Plan included 80,000 tractor-driven binders in its program.[64] The simple truth had finally been acknowledged that "in our country with its large differences in natural and economic conditions," the harvesting methods have to be varied.[65] But the combine had not been banished from the areas to which it is unadapted. It is obvious from Demidov's comments and also from the limited number of binders to be delivered to agriculture that the combine will continue to be used there on a large scale along with the binder and other harvesting machinery.

Saving the straw and chaff.—Practically all chaff is used for feed in the USSR, and the loss even of part of it in combining is a considerable drawback. Almost all the straw is likewise saved. When not needed for roofing, feed, or bedding, it is used for fuel. Too little attention was given to the chaff and straw problem when the combine was introduced. Indeed, the combines frequently harvested only the heads, the chaff and short straw were blown away, and the peasants were supposed to cut the tall stubble for straw later, with mowers or by hand. Later, low cutting with the combine became standard, but a separate operation was required to save the recoverable straw and chaff. Work started on the development of attachments to the combines, so that the chaff and straw could be saved simultaneously with the grain. But the whole problem has not yet been solved, and it is incorporated as one of the goals into the 4th Plan.[66] All chaff and short straw will possibly never be saved in combining.

OTHER METHODS

While the relative cost of harvesting by different methods was disregarded in the adoption of the combine, respect was paid to the cost factor in providing equipment for other harvesting methods. It was apparently realized that with the extremely cheap kolkhoz labor the relatively expensive binder would be a

[64] There were only 10,700 such machines at the end of 1938.

[65] Comments on the 4th Plan by S. F. Demidov, vice-president of the Gosplan, *op. cit.*, p. 171.

[66] I. A. Benediktov, the Minister of Agriculture, in discussing the 4th Plan, said: "An important problem is to produce combines which insure the separate harvest of straw and chaff" (*Socialist Agriculture*, Mar. 30, 1946). On this problem see especially A. Dokuchaev, "Attachments for Harvesting Straw in Combining," *Socialist Reconstruction of Agriculture*, May 1938, pp. 135–39; the article by V. Koltsov in the same issue, pp. 130 and 133–34, and an article by E. Kohan in the June 1938 issue of the magazine, pp. 67–68.

poor investment as compared with more primitive harvesting machines, in addition to having the disadvantage of requiring the use of imported binding twine.

There were 852,000 grain reapers as compared with only 54,900 binders on Soviet farms in 1938.[67] Moreover, the reapers were mainly of the simplest type, which only cuts the grain. Thus not only the binding of sheaves but also the removing of the cut grain from the platform of the mower must be performed by hand. Since this work is very hard, the machine is significantly called "brow-sweater." The reaper which has an attachment for laying the grain in swathes is comparatively rare. It is noteworthy that from 1933 to 1938 the very small number of binders, both tractor and horse, declined by 32 percent, while the number of the more primitive reapers was reduced only by 10 percent.[68]

The decision of the 4th Plan to provide agriculture with 80,000 tractor binders does not necessarily change the situation described. The tractor binders are replacing not the more primitive mowers owned and operated mostly by the kolkhozy, but the combines owned and operated by the MTS. In view of the disappointing results with the use of the combines in some areas, the MTS will do part of the harvesting with binders. So far as the two more primitive methods of harvesting are concerned, the "brow sweater," as before, will continue to dominate.

[67] *Socialist Agriculture USSR, 1938*, p. 19.
[68] *Ibid.*

CHAPTER XX

TECHNIQUES OTHER THAN MECHANIZATION

LAND IMPROVEMENTS

Irrigated land.—During the 1st Plan Period the irrigated area of the USSR increased 1,140,000 hectares.[1] Part of this had been irrigated previously. The 2d Plan sought an addition of 1,012,200 hectares to be distributed as follows:[2]

Large projects	570,200
Small-scale projects	135,000
Rehabilitation projects	307,000

The large projects were to be almost exclusively in Central Asia and South Caucasus. Apparently, the Plan was essentially fulfilled. In Central Asia, where most of the irrigated land is located, cropped plowland increased from 3.4 to 5.1 million hectares in the decade 1928–38. But the increase in South Caucasus was small in that period, and outside of these two principal areas the new irrigated land was almost negligible. The huge project of irrigating 4 million to 4.3 million hectares of land by damming the Volga, approved in 1932 and later replaced by a much smaller one, was mentioned on page 117.

The 3d Plan provided for an expansion of 608,000 hectares in irrigated land in Central Asia, Kazakhstan, and South Caucasus.[3] By an order of the Party and government of October 27, 1938, a series of irrigation projects was approved for Saratov, Stalingrad, Kuibyshev, and Chkalov (Orenburg) oblasti, and the Republic of the Germans. These were to raise the irrigated land in those areas to 135,000 hectares by 1941. While the order did not mention it, those small projects were apparently intended to substitute for the greatly curtailed and delayed project of irrigating large stretches of land by damming the Volga.

[1] *2d Plan*, Draft, I, 198.
[2] *2d Plan*, Draft, I, Supplement, pp. 122–23.
[3] *3d Plan*, pp. 134–35.

"Large stretches of irrigated land were abandoned [during World War II] through salinization and reduction to swamp. In Uzbekistan [at the end of 1945] there were 460,000 hectares of unused irrigable land, of which 320,000 hectares were adapted for cotton and 140,000 hectares adapted for grain and other crops"[4]—in plain language, too saline for cotton.

The goals of the 4th Plan are not quite clear. In the general section on agriculture, a goal of 656,000 hectares is set for the rehabilitation of previously irrigated land and for the completion of new irrigation projects.[5] In the section for Uzbekistan, the Plan demands that 460,000 hectares of unused irrigated land be brought under cultivation and 173,000 hectares of new irrigated land developed.[6] The difference between the total for Uzbekistan and the USSR goal above, 23,000 hectares, seems too small for other areas.

Other improvements.—According to Pavlovsky, 600,000 to 900,000 hectares of virgin land in the non-steppe areas were made usable for agriculture each year between early 1929 and 1938.[7] Most of this land was obtained by clearing cutover and thinly wooded land, the rest by drainage.[8] Practically all of this new land was located in central and northern European Russia, a considerable portion of the swamps recovered by drainage having been in White Russia. A small area drained in South Caucasus near the Black Sea was important because of the favorable climate of that region. The areas reclaimed in central and northern Russia had such poor soil that part was unusable as plowland. The land recovered in South Caucasus is used for citrus fruits and tea—a highly valued development.

The 4th Plan calls for the draining of 615,000 hectares, almost half of it in White Russia. The figure apparently includes rehabilitation of drainage systems neglected during the war.

[4] Order of the government, "On Cotton Growing in Uzbekistan in 1946–53," *Socialist Agriculture*, Feb. 3, 1946.

[5] *4th Plan*, Section II, paragraph 26.

[6] *Ibid.*, Section IV, paragraph 45.

[7] M. Pavlovsky, "On Making New Land Cultivable," *Socialist Agriculture*, November 1939, p. 88.

[8] The draft of the *2d Plan*, I, Supplement, p. 124, called for the draining of 2,327,000 hectares in one five-year period.

VARIOUS TECHNIQUES

Under this heading are gathered a number of more or less unrelated practices designed to contribute to the advancement of Soviet agriculture. Several have this in common: though they have been urgently recommended or even enforced, their value has not been proved. Certain of the enforced measures, indeed, have been given a thorough trial in other countries and abandoned as useless if not harmful. Others are still in the experimental stage and do not warrant application on a large scale. The advisability of still others is particularly doubtful because they involve increased use of draft power which is already inadequate.

The sokha.—So far as concerns the favored operators—sovkhozy, MTS, and kolkhozy—the sokha and other primitive plows are dead and certainly unmourned. The tolerated producers, the kolkhozniki and individual peasants, probably continue to use them to some extent; even a wooden plow is preferable to a spade if one has an animal to pull it. In any event, little work was done with such plows before (the 1928 figure in Table 38, p. 458, is too high). Moreover, the adverse effect of the primitive plows on crop output is frequently exaggerated. The Bulgars attain quite good yields with them. The virtual elimination of the sokha primarily means a saving of men and horsepower.

Bare fallow.—Considerable attention has been given during the era of the Five-Year Plans to the proper treatment of fallow. The operations prescribed for it are standard the world over—timely plowing and control of weeds by repeated cultivations thereafter. But not enough draft power was available for thorough performance even in the late 'thirties. The area in "clean fallow" was put at 27.9 million hectares in 1937, when the goal for 1942 was set at 28.4 million.[9] But due care to keep the fallow clean was far from general at the end of the 'thirties. In 1939 only 6.7 to 13.1 percent of the fallow on Siberian sovkhozy received two cultivations after plowing, and only 0.29 to 5.23 percent received three cultivations.[10] The 3d Plan

[9] *3d Plan*, p. 72.

[10] V. Bushinskii and Y. Kotlyarov, "The Agricultural Level in Sovkhozy of Eastern USSR," *Socialist Agriculture*, August-September 1940, p. 100.

emphasized that fallow should be cultivated two or three times —a rather inadequate number, especially in weedy years.

Deep plowing.—Experience in other countries shows that crop (especially grain) production by extensive methods, particularly in areas with insufficient moisture, does not call for deep plowing or subsoiling. These operations seem justified only in sufficiently humid areas of intensive agriculture, where large amounts of manure are used, and especially in growing root and tuber crops. In 1938, Mathews and Cole of the Division of Dry Land Agriculture, United States Department of Agriculture,[11] discussed deep plowing and subsoiling among the "numerous panaceas, proposed, accepted . . . . for a time, but finally discarded . . . . during the past 30 years." They said:

> Deep plowing and subsoiling were discarded because of their expense and because the rain that fell between harvest time and seeding time was often not sufficient to wet the loosened layer. The loose open soil favored loss by evaporation, and such deep tillage was more harmful than beneficial in dry years and ineffective in normal years or wet years.

In Russian areas where moisture is not a problem, the topsoil is generally too thin to permit deep plowing. The needed depth of the topsoil can be built up only slowly by the application of manure. Otherwise the subsoil brought to the surface, practically void of fertility, makes the topsoil even less fertile than before.

A conference on yields, held February 15–18, 1931, by the Academy of Agricultural Sciences in the name of Lenin, dealt in detail with the depth of plowing. It accepted 13 centimeters (about five inches) as the desirable average depth for all areas where the topsoil is sufficiently deep. Among the areas mentioned specifically were the northern zone, the southern and southeastern zones with the southern chernozem, chestnut, and gray steppe soils.[12] The conferees also believed that in the south even shallower plowing was advisable, especially after row crops, in order not to delay seeding.

[11] O. R. Mathews and J. S. Cole, "Special Dry-Land Farming Problems," *Soils and Men: Yearbook of Agriculture, 1938* (U.S. Dept. Agr.), pp. 679–92. This short article utilized the experience of all experiment stations and fields in the Great Plains; it would be superfluous to quote from any of the numerous studies on deep plowing in the various states, by the authors of the quoted article and other members of the Division of Dry Agriculture, especially E. C. Chilcotte.

[12] *Socialist Reconstruction of Agriculture*, February 1931, pp. 101–02.

Subsequent years saw a fundamental change in this attitude. By order of the government and Party of November 1938, a depth of 20 to 22 centimeters (8–9 inches) was prescribed for the southern areas "subject to drought"—the very areas specifically mentioned in the 1931 decision. An order of June 1940 prescribed that fallow be plowed in the Ukraine to 22 centimeters, and the land for sugar beets and cotton to 27 centimeters (about eleven inches). Similar regulations were issued for all other regions, including the non-Chernozem zone.

An important consideration behind this change in attitude was undoubtedly the fact that during the first collectivization years the fields had become greatly infested with deep-rooted weeds which could be eradicated only by deep plowing. But it is believed in the Union that deep plowing has other great merits.

Little really deep plowing has actually been done thus far. Moreover, the daily performances ("norms") prescribed for plowing with both tractors and horses make one doubt that the prescribed depth is taken literally. For example, shortly before the war the daily norm for a one-bottom plow drawn by animals (in most cases probably three rather small horses) was 0.8–0.9 hectare in semiarid areas of southern Russia and Siberia.[13] In Germany, a quarter of a hectare of plowing, at an only slightly greater depth (22.5–25.0 centimeters) than that prescribed in the USSR, was the average daily stint for one horse (considerably heavier than the Russian animals). In the United States, where the horses also average considerably heavier than in Russia, one acre (.4 hectare) of rather shallow plowing is the normal daily performance of one animal. The Soviet norm is probably based on a depth of plowing not much greater than that customary in this country. Furthermore, the norms for plowing with animals, instead of being reduced as the required depth of plowing was increased, were raised for most areas from 1934 to 1939.[14]

The improbability that the ordered depth of plowing is meant literally is indicated also for plowing with tractors. A book written by a large "brigade" headed by Benediktov, the Minister

[13] See F. Sophroshkin and V. Chuvikov, "Norms for Operations in Kolkhozy," *Socialist Agriculture*, April 1940, pp. 24–26.

[14] *Ibid.*

of Agriculture,[15] contains a tabulation of the recomended plowing equipment for all types of tractors in various soils and at different depths of plowing. Three 14-inch bottoms are recommended for a wheel tractor with 15 drawbar horsepower plowing at a depth of 22–25 centimeters in medium soil (0.35 to 0.55 kilogram resistance per square centimeter). In western European countries, two such bottoms constitute the standard equipment for a tractor of that size where the normal plowing is that deep. Also, the allowances of fuel consumption in the USSR are insufficient for attaining the prescribed depth.[16]

Fall vs. spring plowing.—Insuring timely seeding in well-prepared soil was an important requirement difficult to meet with the limited draft power available during the period under observation. This made it extremely important to plow as much land as possible in the fall, even in areas for which spring plowing would be preferable.[17] With typical forthrightness, the planners decreed that fall plowing produces better yields than spring plowing under all conditions, even in areas similar to the northern Great Plains and when the available draft power permits early spring plowing.

Lushchevka.—This is a light tillage operation (the German *Schälen*), disking or very shallow plowing, performed immediately after the removal of the crop, when most of the draft power is too occupied with other tasks to be available for regular plowing. The purpose is to start the accumulation of soil moisture, and nitrification and other processes in the soil, as early in the season as possible. It is unquestionably advantageous wherever fall plowing is more profitable than spring plowing. As in the case of fall plowing, however, the tendency has been to apply the practice indiscriminately.

As a standard operation, lushchevka was prescribed only shortly before the USSR's entrance into war. Its adoption was

[15] I. A. Benediktov and others, *Experience with Activities of MTS* (Moscow, 1946), p. 122.

[16] Implied in data in M. Viner, "Norms of Fuel," *Socialist Agriculture*, April 1939, pp. 67 and 69, and G. Gusev, "Resistance of Tillage Implements," *Socialist Agriculture*, April 1940, pp. 67 ff.

[17] Experience in the United States has shown that yields from spring plowing exceed those from fall plowing in the northern part of the Great Plains, where the harvest is late and moisture from the snow held by the stubble is more important than that saved by preventing weed growth after harvest with fall plowing. See Mathews and Cole, *op. cit.*, p. 690.

almost negligible. Except for the war, however, it probably would have become rather common by 1947.

Shelter belts and similar moisture-preserving measures.—Shelter belts and snow-accumulating barriers as measures to preserve moisture in dry-land areas were given increased attention during the period under review. The government order of July 31, 1931 decreed that within five years the Commissariat of Agriculture was to convert into forests about 2–3 million hectares of cut-over, burned-over, and waste land, important for preservation of water streams. In additon, during 1932–37, 390,000 hectares of shelter belts were to be planted, and 331,000 hectares of ravines and slopes and 657,000 hectares of waste land were to be put into forests on kolkhoz and sovkhoz land. The actual plantings in kolkhozy during 1931–37 amounted to 3,699 hectares on watersheds, 290,290 hectares of shelter belts, 139,326 hectares in ravines, and 170,893 hectares on sand. But these are apparently gross figures—without deductions for losses, which were heavy. In the southeast losses amounted to 51 percent of the plantings. But the plantings were believed worth while, and it was hoped that with improved techniques the losses could be substantially reduced.[18]

It is difficult to ascertain the total shelter-belt area surviving from plantings in the interwar period. A large proportion was lost during the last war, but not necessarily as a result of it. In areas of inadequate moisture, trees must be planted with considerable care to survive.[19] In the USSR, however, much of this work had been done crudely, and the war served as a convenient cover-up for resulting losses. According to one source, of the 125,000 hectares of shelter belt in the Ukraine before the war, 15,000 hectares were lost and 40,000 needed restoration.[20] Another source gave the acreage lost in the Ukraine at 40,000 hectares and that needing restoration at 105,000 hectares out

[18] The cited law has been published in L. Lenskii, *Materials on History of Socialist Forest Legislation* (1917–45), Moscow, 1947, pp. 212–13. Data on actual plantings are from P. Vystavkin, "The State of Field-Protecting Forest Strips in the Southeast," *Socialist Reconstruction of Agriculture*, December 1938, pp. 98–100.

[19] O. R. Mathews and V. I. Clark, *Results of Field Crop, Shelterbelt, and Orchard Investigations at the United States Dry Land Field Station, Ardmore, S. Dak., 1911–32* (U.S. Dept. Agr. Circular 421, 1937), pp. 38–43.

[20] *Socialist Agriculture*, June 6, 1946.

of a total of 259,000 hectares.[21] The loss of plantings during the war was even greater in the Volga region (Saratov oblast, 59 percent of total; Kuibyshev, 79 percent; Astrakhan, 86 percent).[22] The 4th Plan urges the restoration and further expansion of the shelter belts, with emphasis on quick-growing trees and bushes.

A device closely related to shelter belts, but one that has to be renewed annually, is the movable fence or barrier which prevents snow drifting and thus helps to accumulate moisture at desired places. It was not an innovation, and though strongly urged it failed to become fully established. The amount of labor involved may be too large relative to the return. Fifteen million hectares are supposed to have been so protected in 1937.[23] Snow-accumulating barriers are urged now even more strongly than before. The acreage protected is supposed to have increased from 5.5 million hectares in the winter 1945–46 to 16.6 million in the winter 1946–47.[24]

Rotations.—Elimination of rotations was one of the backward steps that resulted from the socialization of agriculture. Even such crops as sugar beets have been grown on the same land year after year where rotation had been a well-established practice long before collectivization. Cotton too was grown without intermission in the same fields, though the beneficial effect of rotating it with alfalfa was well known. Meanwhile, the plowing up of meadows and pastures made it more and more urgent to substitute for them grass grown in rotation.

As a result, instead of extending rotations to areas where they were not used, or shifting to more complicated rotations in other areas, great campaigns for the reintroduction or introduction of rotations became necessary. In the late 1930's, numerous special government orders were issued with complicated rotations prescribed or recommended for different areas, and even for different portions of the same sovkhozy and kolkhozy. As in most other cases, practices of uncertain value were indiscriminately urged with the same vigor as practices of established

[21] A. Pankov, "On Development of Agro-Improvements," *Socialist Agriculture*, March 1946, p. 60. Pankov's statement apparently pertained to all new tree plantings, rather than shelter belts only.

[22] Leader in *Socialist Agriculture*, June 11, 1947.

[23] I. D. Laptev, *Location of Socialist Grain Production* (Moscow, 1940), p. 27.

[24] *Socialist Agriculture*, Dec. 8, 1947.

worth. On the basis of extended experience, Mathews and Cole wrote:

> Sod crops [rotation grass] are considered a fundamental part of the rotation in many humid sections, but in dry-land farming they have not won a recognized place. The inclusion of sod crops in short rotations has not been a success.[25]

This experience has apparently been given too little attention in the Soviet Union. The Soviet authority, V. R. Williams, is praised highly for developing rotations including one to two years of grass for all areas, the dry-land areas not excluded. The Williams system of rotation has been approved in full at the high level and questioning of it is not tolerated. The typical rotation lasts seven, eight, and even ten years. Even if the grass occupies the field only one year, perennial rather than annual grass is to be used. Mixtures of legumes and grasses (clover and timothy in non-steppe areas, alfalfa and crested wheat grass in steppe areas) are to be sown in such proportions that a half-and-half stand is attained. The sod is not broken before the late fall. The place in rotation following the grass is believed to be the best for any crop except winter wheat. Excess of nitrogen in the freshly broken sod is believed harmful to this even if the time factor is eliminated by earlier breaking of the sod. The standard term "crop rotation" has been replaced by "grass-field rotation."[26]

The general situation immediately before Soviet entrance into the war did not favor such undertakings as the recommended seven- to ten-year rotations. These implied looking many years ahead, while people lived mostly from hand to mouth. Little progress was made even in such areas as those of irrigated cotton, where proper rotations are indispensable. According to Morozov, "rotations were introduced in cotton-growing Central Asia in 1941 to 1943 in about one-quarter of all kolkhozy."[27]

The introduction of rotations proceeded at an even slower rate in areas not growing such crops as cotton or sugar beets. According to Lapin, the percentages of kolkhozy of the non-

[25] Mathews and Cole, *op. cit.*, p. 692.

[26] V. R. Williams, *The Principles of Crop Production* (3d ed., Moscow, 1945), pp. 83–110.

[27] G. Morozov, "Rotations in Cotton-Growing Kolkhozy," *Socialist Agriculture*, January-February 1945, p. 55.

Chernozem zone that had introduced rotations by 1938 were as follows:[28]

Region	Percentages
Northern non-Chernozem	12.3
Western	21.1
Central	16.6
Northwestern	6.4
Siberia	20.3

Proper crop sequences, of course, could not be followed rigidly during the war. Indeed the newly introduced rotations disappeared practically everywhere, and work on their reintroduction has now started anew.

Improved seed.—In the early years of the socialization drive the producers and the government were glad to have any seed. Improved seed went the way of rotations and many other good things. The quality of the seed used in those years was probably worse than during the Civil War in the early 'twenties. Special drives were needed to restore the conditions attained before. According to official data, the setback was soon overcome and the provision of selected seed was carried far beyond the pre-collectivization level. In 1938, 67 percent of the grain acreage was seeded with improved seed.[29] Almost all winter wheat was grown from selected seed in that year. The goal for 1942 was 89 percent of the total grain area sown with improved seed;[30] 84 percent was so seeded in 1940. The percentages of acreages sown with improved seed were even higher in some other crops.

Unfortunately the writer has no way of ascertaining the quality of the improved seed. An impartial appraisal of similar attainments in livestock breeding would also be welcomed.

World War II brought a great setback in seed as in everything else. In 1947, the still unsolved problem was not so much to insure selected seed as to provide any clean seed with sufficient germinating power.

Yarovizatsiya.—Professor Lysenko, now the great Soviet authority on breeding and related problems, has developed a method of seed treatment which speeds up ripening. The method

[28] M. M. Lapin, "Experience of Advanced Kolkhozy in Agrotechniques of Winter Crops," *Socialist Agriculture*, January-February 1945, p. 38.

[29] *Socialist Agriculture USSR, 1938*, Gosplan (Moscow, 1939), p. 59.

[30] *3d Plan*, p. 72.

is called yarovizatsiya, the term implying conversion of crops with winter habit into crops with summer habit. It was originally applied only to winter grain, but the method was later found by Lysenko and his followers to be applicable also to spring grain and other spring crops, especially potatoes. The method was tried out in the United States and found useful only for a very limited purpose—breeding work with winter wheat.[31] In the USSR, however, it is sponsored as a general measure, applicable to all or almost all spring crops grown throughout the Union, but especially in the areas with inadequate precipitation. It has been claimed that fourteen million hectares of spring crops were planted with seed treated by Lysenko's method in 1939, that maturing is speeded up by three to five days,[32] and that the attained increase in yield of spring grain was equivalent to 1.5 quintals per hectare.

The 3d Plan ordered that the treatment be extended to all spring crops in the South and Southeast by 1942. The war naturally considerably hindered the fulfillment of this order.

Seeding in mud.—Under the conditions of extreme shortage of draft power and great delays in seeding in the early 'thirties, it was natural to seek ways of coping with the problem. Super-early seeding, or seeding in the mud by hand when the ground was too soft for horses, was proclaimed a great discovery. For several years this practice was included in the plans and enforced, the acreage so seeded reaching five million hectares. But a large proportion of the seed so sown failed to germinate, and a few years later the measure was declared an invention of saboteurs. The seeding of sunflower in the fall met a similar fate.

Hand weeding and gleaning.—Extensive weeding of grain by hand in Russia was formerly done only to millet, but the widespread infestation of fields in the early years of the collectivization drive made general hand weeding necessary. Some 67 percent of the kolkhoz grain was hand-weeded in 1937.[33] While the increase in hand weeding probably is justified by the cheapness of farm labor, it strikes one as curious that a practice

[31] Personal information from Dr. B. B. Bayles of the Bureau of Plant Industry, U.S. Dept. Agr. [32] M. M. Lapin, *Crops* (Moscow, 1947), p. 32.

[33] A. Libkind, "Intensification of Agriculture in the USSR," *Socialist Agriculture*, March 1939, p. 41. The statement applied to the principal grains; secondary grains were hand-weeded to an even greater extent.

involving great labor for little reward became general at the very time when the keynote of agriculture was modernization. Modern weed-control methods include the use of clean seed, treating the seed for disease, weeding by machine, and, last but not least, proper preparation of the seedbed.

Hand weeding of grain on a large scale not only continued to be sponsored after the worst growths of the early collectivization years had been extirpated, but was even expanded. Special campaigns for growing millet, based on extensive hand weeding, under the auspices of the All-Union Academy of Agricultural Sciences of the USSR, were inaugurated in the late 'thirties. They have been urged with increased vigor since the war.

The spread of hand weeding certainly has much to do with the extreme cheapness of the labor of the kolkhoz members. When the compensation for a trudoden[34] is only two kilograms of grain, some straw, and perhaps a small quantity of potatoes and/or vegetables, many an operation becomes profitable which would not be found worth while if the work were decently rewarded. As a result of poor management, labor was frequently expended on the weeding of small-grain fields while such crops as corn, sunflower, and sugar beets, which needed the treatment much more, were left prey to the weeds.

Gleaning is another practice that was resorted to during the lean early years of the collectivization drive and has not been discontinued. It too is closely connected with the miserably small reward of the kolkhoz members for their work, but another motive is behind it. The kolkhozniki leave some of the cut grain in the fields deliberately, so that they can pick it up later for their own use. The kolkhozy are forced to prevent their doing this by gathering the heads left in the field by machinery and/or gleaning.

FERTILIZER

Amounts of commercial fertilizer used.—"Chemization" of agriculture was among the aims even of the 1st Plan and was made one of the principal issues of the 3d Plan. But only fractions of the plans could be fulfilled. Table 41, indeed, reveals

[34] Children and other workers used for this operation usually earned about one trudoden per workday (see pp. 403 and 410).

TABLE 41.—FIVE-YEAR PLANS: COMMERCIAL FERTILIZER PLANNED FOR AND USED IN AGRICULTURE

Year, goal or actual	Total[a]	Superphosphate	Ammonium sulphate	Potassium chloride	Natural phosphates, ground
	Thousand tons; percentages of plant foods				
1927–28, actual[b]	247	227 (*14%*)	12 (*20%*)	8 (*15%*)	12
1932–33, goals of 1st Plan[b]					
Basic variant	4,041	2,158 (*14%*)	783 (*20%*)	1,100 (*15%*)	2,500
Maximum variant	5,966	3,300 (*14%*)	1,249 (*20%*)	1,417 (*15%*)	2,700
1932, actual[c]	715	614 (*14%*)	22	79 (*15%*)	396 (*16%*)
1937, goals of 2d Plan[c]	6,090	3,000 (*14%*)	1,410	1,680 (*15%*)	2,200 (*16%*)
1937, actual[d]	2,515	1,454 (*18.5%*)	659	402 (*41.6%*)	634
1938, actual[e]	2,610	1,593 (*18%*)	706 (*20.5%*)[f]	311 (*41%*)	606
1942, goals of 3d Plan[d]	5,868	3,300 (*18.5%*)[g]	1,660	908 (*41.6%*)	1,040
1950, goals of 4th Plan (enlarged territory)[h]	5,100	Not stated separately			400
	Percent				
Planned increases					
1927–28 to 1932–33					
Basic variant	1,536	851	6,425	13,650	20,733
Maximum variant	2,315	1,354	10,308	17,612	22,400
1932–37	646	389	6,251	2,027	456
1937–42	133	127	152	126	64

[a] Excluding natural phosphates, which are of doubtful value as fertilizer. Their inclusion, in certain Soviet sources, with the basic fertilizers is of recent practice, unjustified and misleading.

[b] *1st Plan*, II, Part 1, p. 336.

[c] *2d Plan*, I, 472.

[d] *3d Plan*, p. 220, except figures for ammonium sulphate which are from *Planned Economy*, 1939, 3d issue, p. 45.

[e] *Socialist Agriculture USSR, 1938*, p. 25. Preliminary data.

[f] Designated nitrogenous fertilizer.

[g] In addition, 150,000 tons basic slag was planned for 1942 as against 36,000 tons used in 1937.

[h] *4th Plan*, Section 2, paragraph 25. The stated goal is 5,100,000 tons of phosphatic nitrogenous, and potassium fertilizer and 400,000 tons of ground natural phosphate.

the rather discouraging picture of one plan merely repeating the unfulfilled goal of the preceding plan, or even scaling down part of it. For example, even if the fertilizer assignments of the 3d Plan had been fulfilled, the applications of phosphorus in all forms in 1942 would have been less than those planned for 1937.

During the 1st Plan Period a start was made only with phosphates. Nitrogen and potassium were not available in quantity until the 2d Period. In 1938, the first year of the 3d Plan Period, applications of phosphates and nitrogen were less than the goals set by the 1st Plan (basic variant) and about half of the goals for 1937. Application of potash and natural phosphates fell even farther short of their targets. Use of the three principal fertilizers declined from 3.2 million tons in 1938 to 2.6 million in 1940.[35]

Unfulfilled goals notwithstanding, Soviet use of artificial fertilizers before the war was large for a country of extensive agriculture, whose use of such materials as recently as 1928 was negligible.[36]

The application of commercial fertilizer was almost discontinued during the war. The goal of the 4th Plan, 5,100,000 tons of commercial fertilizer other than natural phosphates, is smaller than the corresponding goal of the 3d Plan. Moreover, the Baltic States, former eastern Poland, and Bucovina, now incorporated in the Union and included in the 4th Plan, also need commercial fertilizer. The Königsberg area, although small, formerly absorbed quite substantial quantities. However, if the goal of the 4th Plan is reached, it will represent a considerable increase over the prewar level of commercial-fertilizer use. The 1947 goal for deliveries of fertilizer, apparently not reached, was 2.1 million tons.

Total fertilizer.—The Russians, exuberant over the mecha-

[35] Implied in M. Pervukhin's statement in *Pravda*, Apr. 3, 1947. V. Dmitriev (in *Planned Economy*, 1947, 3d issue, p. 34) and others gave a figure of 3.1 million tons, but this probably pertained to the enlarged territory.

[36] Approximate utilization was as follows (in tons of plant food):

Plant food	1928	1938
Nitrogen	2,300	145,000
Phosphoric acid	38,000	385,000
Potash	1,000	127,000

nization of farm draft power, seem to overlook the fact that it is inevitably associated with a reduction in the manure obtained from the work stock. Except for phosphoric acid, the 1938 applications of commercial fertilizers must have barely offset the loss in plant food incident to the great decline in livestock between 1928 and 1938. Not less than 13 million adult horses, 3 million young horses, and large numbers of sheep and goats disappeared. Of course, not all the manure of those animals was effectively used as fertilizer. If we assume that of the total number of horses lost between 1928 and 1938 the manure of 5 million had been regularly saved and used, the manure saved from each horse containing 30 kilograms of nitrogen, 30 of potash, and 15 of phosphoric acid per year,[37] the annual loss amounted to about 150,000 tons of nitrogen and potash, and 75,000 tons of phosphoric acid.

A certain compensation for the lost manure was effected through the greatly enlarged application of peat (see below).

The changes in the total amount of fertilization since the start of collectivization were partly restricted to redistribution of the available fertilizer among the various areas and crops.

Crops fertilized.—Commercial fertilizers have been applied to only a few crops, mainly sugar beets, cotton, and, to a smaller extent, flax.[38] Such crops as grain benefited only in so far as they were grown in rotation with fertilized crops. At the end of the 2d Plan Period in 1937, the privileged crops were receiving much more fertilizer in any form than they had received before collectivization. In the typical grain-and-potato areas, on the other hand, the lost manure was not replaced. These areas included the vast reaches of non-steppe soils which were sorely in need of fertilizer, especially in the form of manure.

The order of preference in allocations of commercial fertilizers for various crops was substantially unchanged in the 3d

[37] According to F. B. Morrison, *Feeds and Feeding* (20th ed., Ithaca, N.Y., 1936), p. 417, a metric ton of horse manure contains about 7 kilograms of nitrogen, 6.5 kilograms of potash, and 2 kilograms of phosphoric acid. A 1000-pound horse produces 12 tons of manure, but not all of it is saved. See also D. N. Pryanishnikov, *Agrochemistry* (3d ed., Moscow and Leningrad, 1940), pp. 440–41.

[38] The kolkhozy growing sugar beets received 868,000 tons of commercial fertilizer in 1938—more than one-quarter of the total used in the whole of the USSR. Uzbek, the chief cotton-growing republic, received 476,000 tons of commercial fertilizer in 1939.

Plan Period (1938–42). Applications to technical crops were scheduled to be increased two to two-and-one-half times,[39] which would have left practically nothing for other crops. The principal change in distribution was the considerable increase planned for flax and hemp, which had received little commercial fertilizer in 1937. The following tabulation shows the percentage of various crop acreages that received commercial fertilizers in 1937 and were scheduled to receive it in 1942:[40]

	Nitrogen		Phosphates		Potash	
Crop	1937	1942	1937	1942	1937	1942
Cotton	43	90	43	100	..	20
Sugar beets	37	70	100	100	40	70
Flax	11	60	35	70	30	60
Hemp	7	50	20	50	12	40

Potatoes and vegetables received only 4 percent of all commercial fertilizer in 1940.

The 4th Plan called for full coverage of fertilizer requirements of technical crops other than oilseeds (cotton, fiber-flax, hemp, sugar beets, rubber plants, tobacco, tea, and citrus fruits), and for substantial increases in supplies for other crops, especially vegetables and potatoes. In plain language this indefinite statement may mean that considerable cuts are planned in per-hectare allocations to technical crops in favor of vegetables and potatoes as compared with the 3d Plan. With allowance for the difference between barn and on-the-root yields, the goal for the yield of irrigated cotton of the 4th Plan is smaller than that of the 3d Plan and this makes it probable that the 4th Plan allocations of fertilizer to this crop are smaller than those of the 3d Plan. An even greater cut was probably made in allocations to sugar beets, the yields of which are not expected to reach the prewar level in 1950 (see pp. 526 and 584–85). The 4th Plan, however, did not intend to provide even the suburban producers of potatoes and vegetables with more than very moderate quantities of commercial fertilizer.

The portion of the 4th Plan pertaining to the distribution of

[39] Y. Bumber, "Agriculture of the USSR in the 3d Plan Period," *Problems of Economics*, 1939, 4th issue, p. 55.

[40] *3d Plan*, p. 75.

fertilizer was revised by the government order of September 16, 1947, "On Measures for Raising Yields in Areas with Adequate Moisture," which provides for a further increase in allocations of commercial fertilizer to grain and potatoes in these areas.

Fertilizer in semiarid climates.—It is the commonly accepted opinion of experts that the application of either manure or commercial nitrogen is unprofitable in semiarid regions. In such areas the plants normally suffer from moisture deficiency. Nitrogen in manure or commercial fertilizer stimulates the development of the plants in their early stage, and thus increases the utilization of soil moisture. Less moisture remains for the critical period when the seed or fruit is being developed by the plant. The ultimate outcome may be that fertilized crops yield less than unfertilized.[41]

Until the early 'thirties that opinion had been shared also by Soviet authorities, but lately it has been declared a saboteur's idea. The findings by N. M. Tulaikov, the well-known head of the Experiment Station at Bezenchuk, Kuibyshev oblast, have been frequently cited as proving the inadvisability of nitrogen applications in semiarid regions. Having become a Party member, however, Tulaikov, had to become an advocate of such applications.[42] But there is no enthusiasm in his later writings on this subject. After having dismissed it with a few words, he goes on to say: "With us [in semiarid regions] weeds are the basic obstacle to high yields of wheat."

The question of the advisability of using nitrogen in semiarid regions of Russia is more or less academic at best. Farmers in these woodless areas use most of their manure for fuel. When used at all on crops, it is generally applied to winter grain in the USSR. According to the estimate of Lapin,[43] apparently pertaining to 1944, 82.2 to 100 percent of winter grain was sown on manured land in Northern and Central Russia, but the proportion was only 7 percent in the driest steppe regions and 9 percent in regions with the so-called southern chernozem.

Prices, profitableness.—Unfortunately the writer has been

[41] See Mathews and Cole, *op. cit.*, pp. 680–81.
[42] *Socialist Reconstruction of Agriculture*, December 1935, pp. 191–92.
[43] M. M. Lapin in *Socialist Agriculture*, January-February 1945, p. 39.

unable to obtain the prices at which commercial fertilizers are supplied to producers. Owing to the great shipping distances, the delivered cost of fertilizers must be rather high. Since the prices paid by the state for farm products are at greatly varying inflation levels (fibers the highest, grain the lowest, sugar beets in between; see page 369), the use of fertilizers for certain crops may be unjustified. The producers of such crops possibly get the fertilizer at below-cost prices. There are, however, indications of unwillingness of the kolkhozy in certain areas to use the prescribed quantities of commercial fertilizer.

Lime.—It was pointed out in discussing land resources (pp. 131–32) and elsewhere that northern and central Russia are the areas which offer the greatest possibilities for greatly increased yields. One of the first prerequisites for this is elimination of the excess acidity of most of the soils by liming. This is well recognized in the USSR. The 1st Plan called for the application of 11,068,000 tons of lime in 1932–33.[44] But little actual progress has thus far been made. From 1932 to 1934 the applications of lime increased from 65,000 tons to 185,000 tons,[45] but even the latter quantity is negligible. The fact that no data are readily obtainable for later years suggests that little has been done. An article by Kedrov-Tsikman, member of the Academy of Agricultural Sciences, USSR, implies that the goal of the 4th Plan Period for liming is very low.[46]

Peat.—Peasants are urged to use peat, of which immense quantities are available in Russia, as fertilizer. Such applications prove effective if the peat is first used for bedding. Thus enriched, it is believed superior to straw. The evidence on the use of peat for fertilizer before the war seems contradictory.[47] There was naturally a big decline in its use during the war. The plan for 1946 called for 5,504,000 tons in the RSFSR.[48]

The peat supplies, though large, are extremely localized.

[44] *1st Plan*, I, Part 2, p. 335.

[45] *Socialist Reconstruction of Agriculture*, December 1935, p. 179. Chernozem soils do not need liming.

[46] O. K. Kedrov-Tsikman, "Liming in the New Five-Year Period," *Socialist Agriculture*, July 12, 1947.

[47] According to *Socialist Agriculture*, Mar. 17, 1946, 22 million tons of peat were used for fertilizer in the USSR in 1938; but in the March 28 issue the quantity used in 1940 in the RSFSR, the principal area of such use, was given as only 8 million tons.

[48] *Socialist Agriculture*, Mar. 28, 1946.

As with other cheap products, the peat bed must be close to the farm to make its use as fertilizer practicable. Otherwise less labor is involved in growing cover crops than in digging the peat and hauling it to the barns.[49]

IMPROVEMENTS IN LIVESTOCK

Breeding.—Considerable achievements in livestock breeding are claimed. It is not always possible to find out what part of these represent restoration of the status reached before collectivization, or before 1914.

In 1913 Russia had 4.5 million fine-wool sheep.[50] There were 30.5 million fine-wool and semi-coarse-wool sheep in 1939. The share of fine wool in total state procurements increased from 5.8 percent in 1932 to 17.0 percent in 1940; that of semi-coarse wool from 5.2 to 47.0 percent.[51]

In kolkhoz commercial poultry fermy, 94 percent of the stock was purebred in 1939, according to Dyakov; the proportion for all the USSR was 23 percent.[52]

Artificial insemination.—The USSR was apparently a pioneer in using artificial insemination on a very large scale. In 1940, 13.4 million sheep and 1.3 million cows were so treated, but by 1944 these numbers had declined to 3.3 million sheep and 230,000 cows.[53]

Incubators.—The incubator capacity—an innovation for the Union—was estimated at 29 million eggs in 1939.[54]

[49] *Socialist Agriculture*, September 1945, p. 40.

[50] P. Esaulov, in *Socialist Agriculture*, January-February 1945, p. 46.

[51] Data for 1932 from *Socialist Agriculture USSR, 1938*, p. 74. Data for 1940 from S. F. Demidov, *Development of Agriculture in the Postwar Five-Year Period* (Moscow, 1946), p. 142.

[52] V. A. Dyakov, "The Organization of Poultry Fermy in Kolkhozy," *Socialist Agriculture*, August-September 1940, p. 81.

[53] *Socialist Agriculture*, September 1945, p. 29.

[54] Dyakov, *loc. cit.*

CHAPTER XXI

TOTAL CROP PRODUCTION

The correct title for this chapter would be "Vegetable Products," because the corresponding Russian term, *rastenievodstvo*, is wider than crops, including pasture as well. Although the term vegetable products is used here along with the term crops, the preferred employment of the latter is permissible because thus far total acreage is the only data on pasture made available in the USSR. When they speak of output of rastenievodstvo, they mean output of crops.

1ST PLAN PERIOD

Acreages planned.—The basic and maximum variants of the 1st Plan called for respective increases of 20.8 and 22.5 percent in total cropped plowland (Table 42). The principal changes planned for individual crop acreages consisted of huge increases in fibers, sugar beets, oilseeds, and sown grasses; large increases in potatoes and vegetables;[1] and an expansion of about 15 percent in grain—quite a substantial boost considering the preponderance of grain acreage.

The goals of the 1st Plan, however, were soon treated as greatly inadequate and were largely ignored. The expansion drive of those years was anything but a planned one. The following lengthy excerpts from *Directives for the Control Figures for Agriculture in 1930–31*[2] of the Commissariat of Agriculture are characteristic of the sentiments of those stormy days:

> An increase in grain acreages by 15 percent must be attained in 1930–31 [exactly the increase expected by the original plan for the whole five-year period] . . . . The grain acreage of the sovkhozy must increase from 2.5 million hectares this year to at least 6 to 7 million next year; that of the kolkhozy from 30 to 40 million this year to 85–95 million next year [the next year was 1930–31].

[1] The plan was noncommittal as to acreages in potatoes and vegetables, but large increases in output were planned which could hardly have been expected to come from increased yields alone.

[2] Quoted from A. Bodyako and S. Zaitsev, *Laws on Collectivization of Agriculture and the Struggle for the Harvest* (Moscow and Leningrad, 1930), pp. 213–14.

TABLE 42.—FIVE-YEAR PLANS: CROPPED PLOWLAND

Year, goal or actual	Total	Grain	Potatoes	Vegetables	Technical crops: Total	Technical crops: Sugar beets	Technical crops: Oilseeds: Total	Technical crops: Oilseeds: Sunflower	Technical crops: Cotton	Technical crops: Fiber-flax	Rotation-hay
	Million hectares										
1927–28, actual[a]	115.6	97.4	5.49[b]	2.01[c]	7.3	.67	5.80	2.82[b]	.75	1.23	2.8
1932–33, goals for 1st Plan[a]											
Basic variant	139.7	112.1	6.59[d]	....	11.1	.96	8.60	....	1.38	1.60	6.4
Maximum variant	141.3	111.4	6.86[d]	....	11.8	1.09	9.05	....	1.53	1.73	7.3
1932, actual[e]	134.4	99.7	6.11	3.10	14.9	1.63[f]	7.17[g]	5.31	2.17	2.51	8.3
1937, goals for 2d Plan[e]	139.7	104.8	6.63	2.94	13.1	1.45	6.00[g]	4.00	2.04	2.18	10.3
1937, actual[h]	135.3	104.4	6.90	2.10	11.2	1.19	....	3.25	2.09	2.13	10.6[i]
1942, goals for 3d Plan[h]	147.4	102.0	8.00	2.30	11.5	1.20	....	3.15	2.12	1.84	23.6[i]
1950, goals for 4th Plan (enlarged territory)[j]	158.6	105.7	12.6		11.9	1.37	....	3.70	1.68	2.00	21.4
	Percent										
Planned increases											
1927–28 to 1932–33											
Basic variant	20.8	15.0	...	...	52.1	44.0	48.3	...	82.4	30.0	130.0
Maximum variant	22.5	14.1	...	...	61.2	63.3	56.1	...	102.8	40.4	163.3
1932–37	3.9	5.1	8.6	—5.4	—11.9	—11.3	—16.4	—24.6	—6.1	—13.3	24.7
1937–42	9.0	—2.0	16.0	10.0	3.0	1.0	....	— 3.0	1.0	—13.0	100[k]

[a] *1st Plan*, II, Part 1, pp. 324–25, except as noted. The 1927 figures are given as stated in the source. They have been revised later as follows: total 112.4 million; grain, 94.7 million; cotton, 802,100; and flax, 1,204,300. See *Socialist Construction USSR, 1936*, Gosplan (Moscow, 1936), p. 280.

[b] *Statistical Handbook USSR, 1928*, Central Statistical Board (Moscow, 1929), pp. 204 and 208.

[c] Data for 1928; see *Cropped Plowland USSR, 1938*, Gosplan (Moscow, 1939), p. 11.

[d] Estimates; see chap. xxiv, p. 588.

[e] *2d Plan*, I, 468.

[f] Later revised to 1,537,800 hectares; see *Agriculture USSR, 1935*, p. 447.

[g] The composition is different from that in the *1st Plan*; see pp. 573–74.

[h] *3d Plan*, p. 219.

[i] Including feed roots and similar feed.

[j] *4th Plan*, Section II, p. 23. Data of the 4th Plan are for the enlarged territory.

[k] Approximate.

The corn acreage must amount in 1930–31 to at least 10 million hectares; that of soybeans to at least one million [corn and soybean acreages were part of the total grain acreage] . . . .

The cotton acreage next year must be equivalent to 2.5 million hectares as against 1.5 million this year; of the above at least 750,000 hectares must be in the new cotton regions. . . . .

The flax acreage must be increased from 2.4 million hectares this year to at least 4 million in 1930–31.

The mere issuing of such directives was enough to create extreme disorder. The efforts of local authorities to fulfill the directives led to even poorer cultivation than would have prevailed, with the little draft power available and under the disorganized conditions of the time.

Acreages attained.—It was claimed later that the expansion of cropped plowland from 112.4 million hectares in 1927 to 134.4 million in 1932 was according to plan (see Table 42 and Chart 25). Until 1931 it progressed, indeed, exactly according to plan, but in 1932 a setback occurred which could not be explained by any extraneous factors, such as widespread winter killings or lateness of spring. Large discrepancies could also be observed between the goals for individual crops and areas actually attained. The acreages in sugar beets, cotton, sunflower, and vegetables greatly exceeded the Plan goals, while the acreage in grain remained far behind the goal.

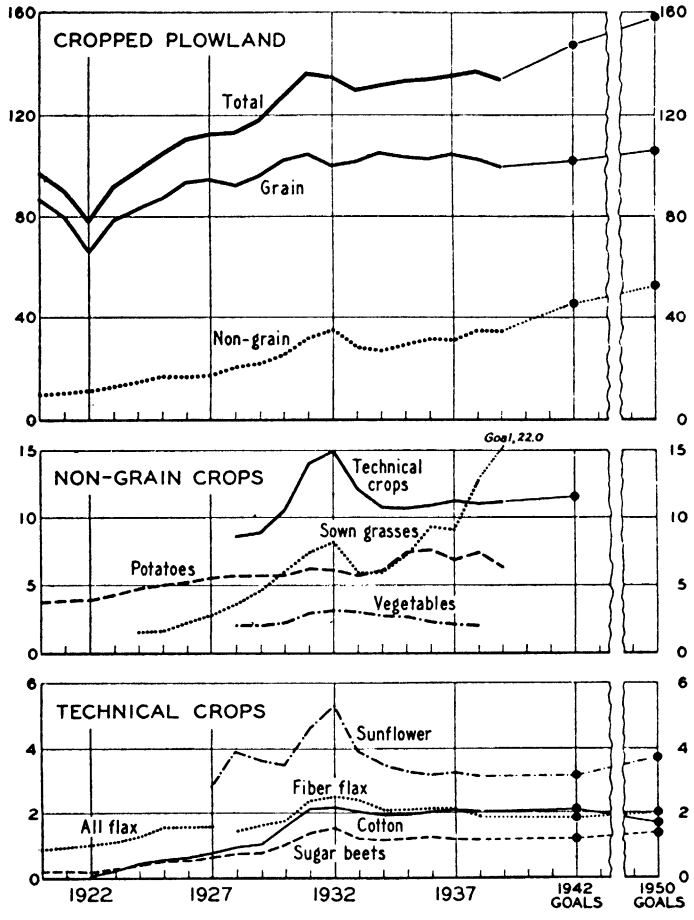
But all this is beside the point. The goals referred to are those of the 1st Plan, which were in due time abandoned. Actual accomplishments bore little resemblance to the goals of the Commissariat of Agriculture mentioned above, and of all other plans of that time intended to replace the "timid" goals of the 1st Plan. The fact that the kolkhoz grain area was 61 million hectares in 1931 instead of the specified 85–95 million implied that the goal for the total grain acreage, not disclosed in the cited order, was missed by a wide margin. The corn area, which was supposed to jump to 10 million hectares in one year, never reached even 4 million hectares. The area in soybeans remained at less than half of the one million hectares it was supposed to reach or exceed in a single season.[3]

Moreover, such expansion as did occur was of questionable

[3] An order of the Council for Labor and Defense of Nov. 1, 1929 even called for 1,500,000 hectares of soybeans in 1932.

CHART 25.—CROPPED PLOWLAND: MAJOR CROPS, 1920–39 AND GOALS FOR 1942 AND 1950*

(Million hectares)

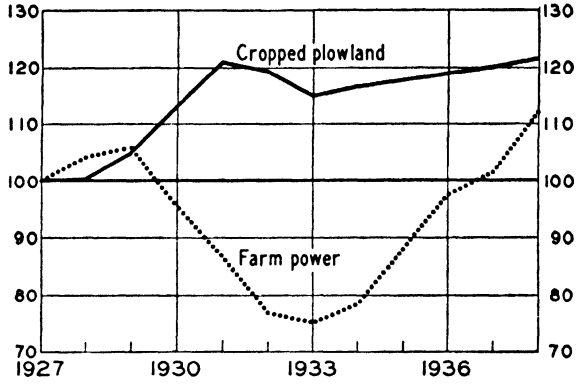


* Data in Chart Appendix. 1950 goals for enlarged territory.

value. The rapid increase in cropped plowland provided for in the 1st Plan was supposed to be accompanied by a similar increase in draft power (horses alone were to increase by 19.7 percent), but total draft power was actually reduced by almost 30 percent during the period (Chart 26). The added acreage could be of little use under such conditions, and a large part of the expansion was in fact harmful. The increase that did take place was attained simply by force. Part of the acreage reported as seeded and harvested was never seeded, while part was sown in unprepared ground, and part was never harvested.

All operations were critically delayed, and the weeds with which the fields were infested in those years had not been fully exterminated when the war came in 1941.[4] The decline in acreage in 1932, although moderate, represented a very significant reaction to all this wastefulness.

CHART 26.—CROPPED PLOWLAND *vs.* FARM POWER, 1927–38*
(*Percent of 1927*)



* Based on data in Chart Appendix.

Yields planned.—The increase in yields, provided by the 1st Plan in its maximum variant which became the law (Table 43), was in the realm of wishful thinking, especially since the Plan was not approved before the 1929 crop was already largely sown. There was no upward trend in yields from 1927 to 1929 (Chart 27, p. 508), and thus the five-year plan was in effect a three-year plan, so far as yields were concerned.

The yield of 9.5 quintals of grain projected for 1932 under the maximum variant would have meant an increase of almost 20 percent or over 6 percent a year.[5] No country has ever succeeded in boosting its level of grain yields at even approximately this rate, even through such rapidly acting stimulants as greatly increased applications of commercial fertilizer.[6]

The 9.5 quintals of grain per hectare were equivalent to

[4] See pp. 510 ff. for details of some of the techniques of that period.

[5] The trend value for the time immediately before the 1st Plan Period is here assumed to have been 8 quintals per hectare.

[6] In spite of the greatest efforts of the Hitler government, the level of grain yields in Germany did not increase by more than 2 percent per year between 1933 and 1939.

14.1 sixty-pound bushels per acre. The average yield of small grains in the United States for 1929–38 was 14.4 bushels. For the most part the farmers of the United States certainly employ modern techniques, and substantial quantities of small grains,

TABLE 43.—FIVE-YEAR PLANS: YIELDS OF SPECIFIED CROPS

Year, goal or actual	Grain	Potatoes	Sugar beets	Sunflower seed	Irrigated cotton,[a] unginned	Flax fiber	Hemp
	Quintals per hectare						
1909–13, actual	8.0[b]	....	155[c]	7.5[c]	11.7	3.6[c]	...
1927–28, actual	7.5[d]	75.1[e]	135[f]	7.6[e]	9.3[d]	2.3[d]	5.4[e]
1932, goals of the 1st Plan[d]							
Basic variant	8.9	....	172	...	12.2	3.0	...
Maximum variant	9.5	....	180	...	12.5	3.6	...
1932 (1928–32 average), actual[g]	7.5	78.1	120	5.5	7.5	2.3	2.8
1937, goals of the 2d Plan[c]	10.0	110.0	200	8.5	12.0	3.7	5.8
1937, actual[h]	11.5	95.6	183	6.4	14.8	2.7	3.9
1942, goals of the 3d Plan[h]	13.0	125.0	250	9.0	19.0	4.6	5.0
1950, goals of the 4th Plan (enlarged territory)[i]	12.0	....	190	10.0	19.9	4.0	...
	Percent						
Planned increases							
1927–28 to 1932							
Basic variant	17	....	27.4	....	31.2	30	...
Maximum variant	25	....	33.3	....	34.1	56.5	...
1932–37	33.3	40.9	66.6	54.6	60.0	63.7	107.0
1937–42	13.0	31.0	37.0	41.0	28.0	70.0	28.0

[a] No figures appear for unirrigated cotton until the *3d Plan*, which gives an actual yield of 4.6 quintals per hectare for 1937 and the goal for 1942 of 6.0 quintals, 30 percent higher.

[b] Estimate of the Gosplan prior to 1930.

[c] *2d Plan*, I, 467 (hemp data, p. 229).

[d] *1st Plan*, II, Part 1, pp. 324–25. Figure for flax fiber, 1927–28, probably an understatement.

[e] *Statistical Handbook USSR, 1928*, Central Statistical Board (Moscow, 1929), pp. 209 and 212–13.

[f] *Statistical Handbook USSR, 1928*, p. 206, gives 152 quintals.

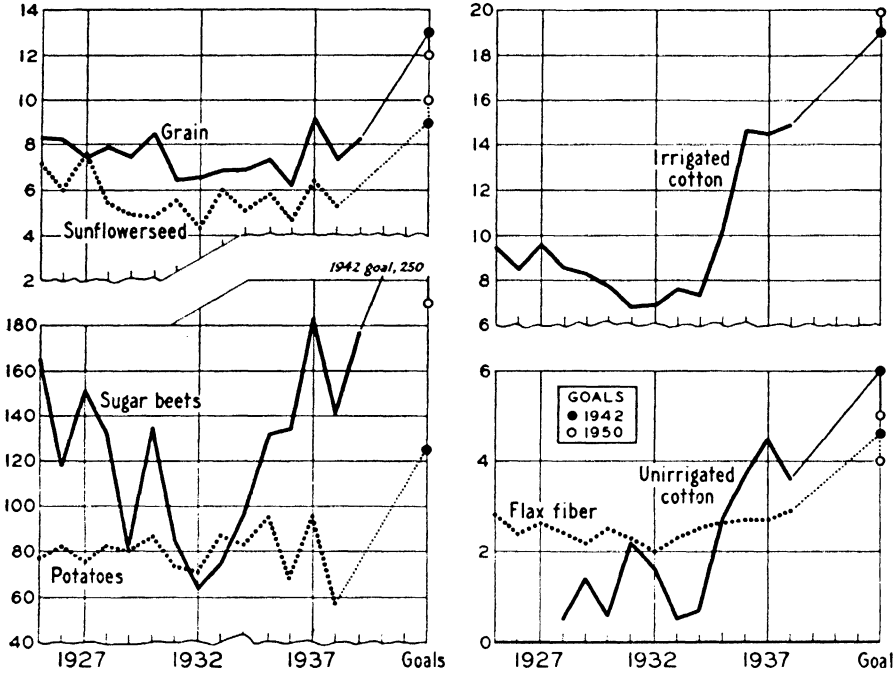
[g] In drafting the yield goals of the 2d Plan, averages of 1928–32 were used as the bases, rather than 1932 alone as in the case of acreages and production.

[h] *3d Plan*, pp. 219–20. On-the-root yields for grain.

[i] *4th Plan*, Section II. Data of the *4th Plan* are for on-the-root yields.

CHART 27.—YIELDS OF MAJOR CROPS, 1925–39 AND GOALS FOR 1942 AND 1950*

(Quintals per hectare)



* Data in Chart Appendix. Grain goal for 1942 and all goals for 1950 are on-the-root; 1950 goals for enlarged territory.

especially oats, are grown here under natural conditions considerably more favorable than those found in the USSR.

The fact that the Gosplan was bound by a government decree ordering a 35 percent increase in grain yields in the Plan Period[7] may partially explain the unfulfillable goals. By somewhat arbitrarily interpreting the order and fixing yearly increases, the planners succeeded in reducing the figure to somewhat less than 20 percent so far as the 1st Plan Period was concerned.[8]

[7] *1st Plan*, II Part 1, pp. 290–91. See also Y. A. Yakovlev's report to the IVth Session of the Central Executive Committee, USSR, in December 1928, in which he said: "We are discussing the problem of an increase in yields by practically six percent per year" (*Problems of Socialist Organization of Agriculture*, Moscow, 1931, p. 278). One year earlier Oganovskii, a real expert on Russian agriculture, had warned: "We cannot expect that the increase in grain yields in the whole Union will exceed 25 to 30 percent in 15 years, or 1.5 to 2 percent per year" (N. Oganovskii, "Reconstruction of Agriculture and the General Plan," *Socialist Economy*, V, 1927, 2d issue, p. 48). He emphasized, however, that the increase might be larger in areas with intensive agriculture.

[8] The Gosplan assumed that the ordered increase was to be the result of the functioning of the plan over the entire five years. Thus a fraction of the 35 percent increase could be reserved for the season following the goal year, that is, for the crop of 1933. The

The pressure of this decree also explains the obvious inconsistencies between the maximum-variant yield goals for grain and certain other crops (Table 43, p. 507). Since the plan provided for substantial applications of commercial fertilizer to the entire sugar-beet acreage, the maximum goal of 18 tons of beets per hectare[9] was more reasonable than a grain yield of 9.5 quintals. Still easier to attain was the 12.5 quintals planned for irrigated cotton in 1932.

The goals of the basic variant of the 1st Plan (in which the authors themselves probably believed) would not have been altogether unrealistic had economic conditions been favorable. There was, however, no prospect that those favorable economic conditions would materialize, and the authors of the plan either knew or should have known this. The planned grain yield of 8.9 quintals per hectare for 1932 was 11 percent above the 8 quintals here accepted as the normal yield for 1927. While not beyond the limits of possibility, such an increase would have been substantial, considering that much grain was grown in very dry regions, that little manure was used on it and only 5.0–6.5 percent of the grain area was scheduled to receive commercial fertilizer, and that knowledge, techniques, and skills were generally at a very low level.

The yields planned in the basic variant for other crops were reasonably consistent with the yield of 8.9 quintals for grain. The crops slated to receive much commercial fertilizer were naturally expected to show considerably greater increases in yields

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planners set this fraction at a full third, leaving a 24 percent increase to be achieved by 1932. (The Gosplan frequently resorted to this expedient in setting goals for the 1st Plan. Kolkhoz grain production, for example, was to increase 9.5 million tons between 1927 and 1932, and another 4.6 million in the following year. See *1st Plan*, II, Part 1, pp. 328–29.) Furthermore, the planners assumed a normal yield of 7.7 quintals per hectare for the base year 1927–28, instead of the 8.0 quintals clearly indicated by official statistics and, indeed, implied in their own acceptance of a total output, under normal weather conditions, of 75 million tons of grain in that year (*ibid.*, p. 291). This had the effect of reducing the required increase to only 20 percent; this increase, moreover, was to represent the maximum variant. Another and more striking example of this sort of handling of data in the 1st Plan was the Gosplan's estimate of the value of crop production in 1927–28 (see page 660). The lowered bases obviously made the goals appear much larger, in percentage terms, than they really were. The planners unquestionably met a problem in producing a semblance of compliance with the decree on grain yields to be attained. M. Wolf, who was primarily responsible for the agricultural part of the plan, though a good Party member, was handicapped in complying with Party orders by his knowledge of agriculture.

[9] The pre–World War I yield was 15.5 tons and the 1925–28 average 14.1 tons.

than grain. The scheduled increase in the yield of flax was actually not as large as indicated in Table 43, because the normal yield for 1927, upon which the increase was based, was at least 2.5 quintals instead of 2.3 quintals as stated in the Plan.[10] Moreover, the goal of 3 quintals per hectare of flax in the basic variant was still below the pre-1914 level.

The goals for 1933 were less realistic than those for 1932, even in the basic variant.[11] As against the increase in the grain yield of 11 percent from the time the Plan became effective through 1932 (actually three years), an increase of 6 percent was planned for the single year 1933.

Unrealistic as the maximum yield goals of the 1st Plan may seem, they were soon discarded as not taking into account the immense possibilities created by the socialization of agriculture.

Poor cultivation: poor yields.—Instead of showing the expected large increases, yields actually fell during the operation of the 1st Plan. For some crops the declines were more spectacular than the expected rises (see Chart 27, p. 508).

The great decreases in yields were the natural consequence of extremely poor cultural practices and disastrous delays in all operations. Only 14 and 16 percent of the spring crops were sown by May 1 in 1931 and 1932 respectively,[12] as against 38 percent in 1930, when sowings were also late. The great delays in seeding corn and sunflower are obvious from the following data (in percent of total acreage):[13]

Year	Corn sown before May 1	Sunflower sown before May 15
1930	33	86
1931	4	58
1932	8	46
1933	12	48
1934	59	72
1935	74	..

[10] According to *Control Figures of the National Economy USSR for 1928–29*, Gosplan (Moscow, 1929), pp. 409 and 474, the average yield was 2.55 quintals in 1925–28. The lower yields shown in *Statistical Handbook USSR, 1928*, Central Statistical Board (Moscow, 1929), p. 215, were obtained by dividing the output by the total flax acreage, including oil flax.

[11] *1st Plan*, II, Part 1, pp. 324–25.

[12] *Agriculture USSR, 1935*, Commissariat of Agriculture USSR (Moscow, 1935), p. 352.

[13] *Ibid.*, pp. 364 and 393.

In 1933, 30 percent of the corn acreage and 29 percent of the sunflower received no weeding at all, and only 34 and 19 percent respectively were weeded twice.[14] Thinning of sugar beets, an indispensable operation, was performed on the following percentages of acreages:[15]

	Percent
1930	91
1931	72
1932	54
1933	72
1934	79

The following figures illustrate the delays in various harvesting operations. In 1932, 1933, and 1934 respectively, 22, 15, and 21 percent of the small grain had not been cut by October 1.[16] In 1932, 71 percent of the corn acreage had not been harvested by November 1, and 53 percent of the sunflower area was unharvested on October 15. The normal finishing date for sugar-beet harvesting in the Ukraine is October 20. In 1930, 85 percent of the harvesting had been completed by this date, but only 59 percent in 1932,[17] when 34 percent of the sown acreage was completely lost. Abandonment of vegetables was also extensive (p. 598).

The poor cultivation and untimely seeding naturally resulted in poor growth, while a large proportion of what did mature was lost through delayed harvesting.[18] Soviet authors themselves reached the conclusion that a delay of ten days to one month in mowing results in the loss of about half the digestible protein in hay.[19] Yet delays of haying by several months were a common occurrence at that time.

A final bit of illuminating information is the fact that in 1932 only 22 million tons of manure were applied,[20] probably not more than 10 percent of normal.

Percentage declines in yields of major crops from the average

[14] *Ibid.*, pp. 378 and 396. Hand weeding is referred to; cultivation of those crops with machinery had not yet been introduced.

[15] *Ibid.*, p. 455.

[16] *Ibid.*, p. 381.

[17] *Ibid.*, p. 456.

[18] Data showing very large losses in harvesting grain in those years are presented in Appendix Note G, pp. 729–30.

[19] See, for example, *Agriculture USSR, 1935*, p. 154.

[20] *Socialist Construction USSR, 1936*, Gosplan (Moscow, 1936), p. 353.

of 1925–28 to the average of 1931 and 1932 were as follows:[21]

	Percent		Percent
Grain	14	Flax	14
Sunflower seed	27	Sugar beets	47
Potatoes	10	Hay, wild	23
Vegetables	40	Hay, rotation	31
Cotton, irrigated	24		

As the figures stand, the decline was relatively small for flax, grain, and potatoes. But the yield of flax was very low in the base period. Official grain yields in 1931 and 1932 were exaggerated, provided the unquestionable overestimates of output were not fully due to overestimated acreages (see pp. 539–40). The yields of potatoes in those years were probably also overstated, with the same reservation as in the case of grain (see pp. 588–89).

Output.—The official 1932 yield of grain was 12 percent below that in 1927 (about 16 percent below the trend value for that year). The increase in acreage, which was officially calculated at about 8 percent, was not sufficiently large to offset this decline. While the decline in grain production was officially estimated at about 5 percent (Table 44, Chart 28), it actually was larger.[22] The officially estimated yield of sugar beets in 1932 was less than half the pre-collectivization level, and the production from the greatly expanded acreage was only two-thirds of that level. As to potatoes, still grown chiefly by individual peasants and kolkhozniki in their own plots, official data indicate that expansion in acreage offset reduced yields but the output was probably moderately overestimated. Hay showed declines in acreage and (both wild and rotation hay) in yield, and consequently an even greater fall in output. Less straw, chaff, and other by-products were saved and the pastures were only partially utilized owing to shortage of livestock.

In sunflower seed, the decline in yield about offset the increase in acreage. Only in cotton, flax, and vegetables could the large expansion in acreages overcompensate the decline in yields (see Table 44).

[21] Official, except for vegetables. The yield in 1928 only was used in computing the percentage decline in hay.

[22] See the analysis of utilization on pp. 551–56 and in Appendix Note J.

TABLE 44.—FIVE-YEAR PLANS: OUTPUT OF VEGETABLE PRODUCTS

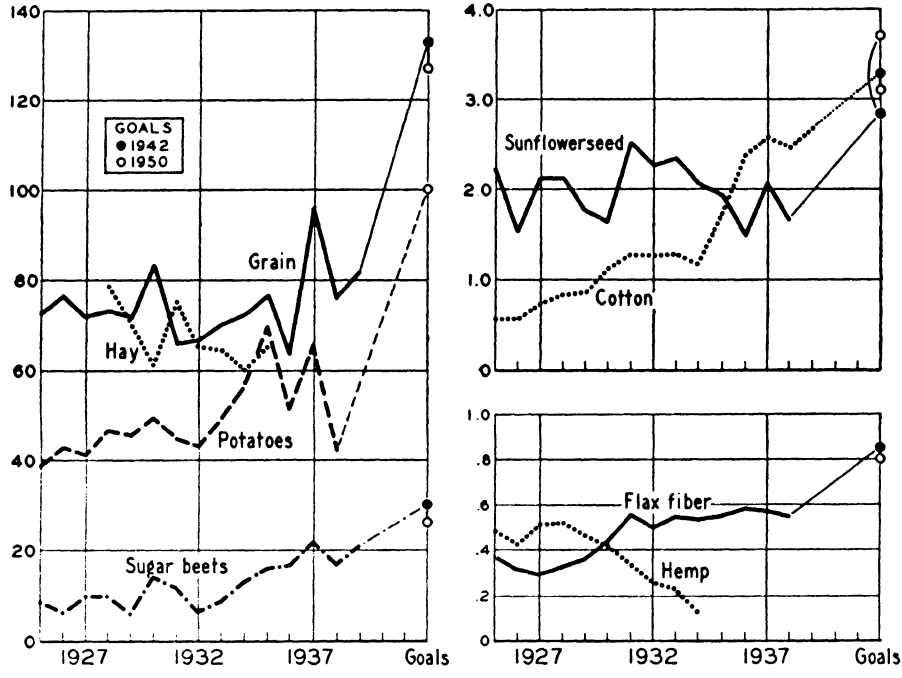
Year, goal or actual	Gross value	Grain	Potatoes	Vegetables	Sugar beets	Oilseeds		Fibers			Rotation hay
						Total	Sunflower seed	Cotton unginned	Flax fiber	Hemp	
	Million 1926–27 rubles	*Million tons*						*Thousand tons*			*Million tons*
1927–28, actual[a]	9,216	73.1	42.2	15.1	10.1	3.40	2.18	720	250	460	6.9
1932–33, goals for 1st Plan[a]											
Basic variant	13,232	99.7	60.0	21.6	16.8	5.94	3.67	1,680	480	530	18.8
Maximum variant	14,467	105.8	67.0	27.2	19.6	6.72	4.05	1,910	620	600	22.3
1932, actual[b]	9,779	69.9	43.1[c]	16.9[d]	6.6	....	2.27	1,270	500	262	....
1937, goals for 2d Plan[b]	18,133	104.8	73.0	28.1[d]	27.6	....	3.40	2,125	800	476	....
1937, actual[e]	15,070	120.0	65.6	....	21.9	3.22	2.08	2,580	570	...	....
1942, goals for 3d Plan[e]	20,600	133.0	100.0	....	30.0	4.80	2.83	3,290	850	...	....
1950, goals for 4th Plan (enlarged territory)[f]	.....	127.0	....	....	26.0	....	3.70	3,100	800	...	....
		Percent									
Planned increases											
1927–28 to 1932–33											
Basic variant	43.6	36.4	42.1	43.0	66.4	74.5	68.4	133.5	93.7	14.8	174.5
Maximum variant	57.0	44.7	58.5	79.8	93.6	97.6	85.9	165.5	150.4	29.1	224.9
1932–37	85.4	50.0	69.4[g]	66.4	320.7	....	50.4	67.3	60.0	81.6	....
1937–42	37.0	11.0	52.0	....	37.0	49.0	36.0	28.0	49.0	....	....

[a] *1st Plan*, II, Part 1, pp. 326–27 and 330–31.
[b] *2d Plan*, I, 225, 390, 432, 466, and 467–68. Potato goal, 1937 is product of planned acreages and yield.
[c] *Agriculture USSR, 1935*, p. 471; but the 1937 goal was probably based on a 1932 output of 47.7 million tons.
[d] Vegetables for human consumption.
[e] *3d Plan*, pp. 89 and 218.
[f] *4th Plan*, Section II. The data are for on-the-root production.
[g] Actually an increase of about 50 percent was expected; see note *c*.

Thus, to summarize, there were increases in the output of fibers, oilseeds, and vegetables during the 1st Plan Period, and declines in grain, sugar beets, and all kinds of roughage (hay, straw, pasture), with total output of crops likewise declining.[23]

CHART 28.—PRODUCTION OF MAJOR CROPS, 1925–39 AND GOALS FOR 1942 AND 1950*

(*Million tons*)



* Data in Chart Appendix. Grain goal for 1942 and all goals for 1950 are on-the-root; 1950 goals for enlarged territory.

A great deterioration in quality of produce accompanied this decline. For example, "from 135,000 tons of flax, procured for the industry of the country in 1932, only 7,500 tons were of good quality."[24]

When actual 1932 crops are compared with the basic and maximum goals of the 1st Plan, the following percentage deficits (—) or excesses (+) are obtained for individual commodities:[25]

[23] Official computations of the value of the production of vegetable products, which do not include pasture, indicate an increase, but they require corrections. See pp. 668–71.

[24] *Socialist Agriculture*, June 30, 1946.

[25] Official, except for the 1932 grain and potato crops for which the writer's estimates of 66.5 million and 40 million tons respectively are used.

Product	Basic	Maximum
Grain	−33.0	−37.9
Sunflower seed	−31.3	−38.1
Cotton	−24.4	−33.5
Flax	+ 1.7	−21.7
Hemp	−50.6	−56.3
Sugar beets	−61.0	−66.5
Potatoes	−33.3	−40.3
Vegetables	−23.2	−39.9
Sown grasses	−21.2	−34.9

Flax alone reached its goal, but only of the basic variant, while actual production of sugar beets amounted to but one-third of the maximum goal. The following tabulation compares the basic and maximum goals for total crop production set in the 1st Plan with official and corrected estimates of actual production in 1932 (in terms of 1926–27 rubles)—with deterioration in quality disregarded:[26]

	Million rubles	Percent below basic goal	Percent below maximum goal
Planned for 1932–33			
Basic goal	13,232	....	....
Maximum goal	14,469	....	....
Actual, 1932			
Official estimate	9,779	26.1	32.4
Corrected estimate	8,726	34.1	39.8

In its report to the World Economic Congress in Amsterdam, August 23–29, 1931, the Soviet-Russian Delegation made statements which appear at least premature in the light of those results. It said:

> In contrast to the course of agricultural evolution in other countries, agriculture of the Soviet Union has in recent years entered a period of unusually rapid growth.[27]

Soviet claims destined for domestic consumption were more modest. The resolution of the Party and government of January 10, 1933, on the results of the 1st Plan, while also stressing "the severe crisis and catastrophic fall of farm production in capitalist countries," was satisfied to point out "an advance in the agriculture of the USSR."[28]

[26] For details, see chapter xxviii.

[27] *Social Economic Planning in the Union of SSR* (New York, 1931), p. 106.

[28] *Summary of the Fulfillment of the 1st Five-Year Plan for the Development of the National Economy of the USSR*, Gosplan (English ed., Moscow, 1933), p. 22.

2D PLAN PERIOD

Acreages planned.—Although the big expansion of cropped plowland was hailed as a great success, and the large increase planned for farm draft power should have permitted further expansion, the following quotation reveals the decision to concentrate on obtaining better yields from acreages of reasonable proportions: "The attained successes [in extending the cropping to new land] permits directing the principal attention during the 2d Plan Period not to addition of new lands, but to improvements in cultivation of the land already under the plow."[29] The 2d Plan was therefore satisfied to establish as its target for 1937 an increase in cropped plowland of 3.9 percent (Table 42, p. 503).

The principal feature of the planned distribution of individual crops within the total cropped plowland was the contraction of technical crops, especially oilseeds. The greatly expanded area in vegetables of Type 1 (see page 597) was to be almost fully maintained, while grain and potato acreages were to be increased by 5.1 and 8.6 percent respectively.

Acreages attained.—The change in the development of cropped plowland began as early as 1931 (Chart 26, p. 506). Moreover, discontinuation of the pressure toward expansion at all costs resulted not merely in a greatly reduced rate of increase, as planned, but in a decline. Since the break occurred in 1931, even the "timid" goals of the 1st Plan for 1932 and 1933 were never reached.

From a peak of 136.3 million hectares in 1931, the total cropped plowland dropped to 129.7 million hectares in 1933. The decline was almost made up later, but only gradually, and the seemingly moderate goal of 139.7 million hectares of the 2d Plan, a simple reaffirmation of the basic goal of the 1st Plan, was missed by 4.4 million hectares.

The deviation from the Plan was even greater in individual crops. The acreage in technical crops (fibers, oilseeds, sugar beets, tobacco, rubber plants), slated to decline 1.8 million hectares from the 1932 level, fell by twice as much. The area in

[29] *2d Plan*, Draft, I, 208.

vegetables, which was to be approximately maintained, dropped to two-thirds of the level reached in 1932.[30]

Yields and output planned.—While hopes for fantastic expansions of acreages had been abandoned, optimism with reference to high yields, made possible by socialization, continued in full bloom. The yields of pre-collectivization years, which the 1st Plan had designed to exceed by substantial margins, appeared large compared with those realized in 1931 and 1932. In spite of this failure, the 2d Plan was not satisfied simply to restate the goals even of the maximum variant of the 1st Plan (Table 43, p. 507). An exception was made only for irrigated cotton, the new goal for which (12 quintals, unginned, per hectare) was slightly below the previous goal.

The 2d Plan called for a yield of 10.0 quintals per hectare of grain in 1937, equivalent to 14.9 sixty-pound bushels per acre. This goal was 25 percent above the pre-collectivization level, and exceeded the average prewar yield of small grain in the United States. It was certainly unattainable, as the planners unquestionably knew. They must have known that draft power would still be short in 1937, that weed infestation could not be controlled for years, and that not even as moderate an amount of manure as was used before collectivization would be available in 1937; nor were they planning large allocations of commercial fertilizer to grain to offset this shortage.

The 10.0 quintals per hectare of grain planned for 1937 would not have been unreasonable if calculated in the new terms of biological yield, as it may have been. At the time the Plan was set up, the change in the method of estimating grain crops had already gone into effect with the 1933 crop. Under the new system, yield and output were determined in the field some time

[30] Both the goals and the rate of their fulfillment appear in a somewhat different light if the 1933 acreage instead of the 1932 is used as the basis of comparison. (The 1933 crop had already been harvested when the 2d Plan was prepared.) The total cropped plowland was 129.7 million hectares in 1933 as against 131.4 million in 1932. Hence the goal of the 2d Plan implied an increase of 7.7 percent rather than 3.9 percent, and the actual 1937 acreage of 135.3 million hectares represented a 56 percent fulfillment of the planned increase rather than one of 17 percent. The change of base considerably alters the picture for technical crops as well. These crops occupied 12.0 million hectares in 1933 as against 14.9 million in 1932. The 1937 goal, 13.1 million hectares, was 1.8 million below the 1932 area, but 1.1 million above 1933. While on the basis of the 1932 figure a planned decline in the acreages in technical crops was fulfilled in part, on the basis of the 1933 figure those acreages moved during the 2d Plan Period in a direction opposite that provided by the Plan.

prior to harvest, with a very inadequate 10-percent discount allowed for subsequent loss.[31] The 1937 goal for the grain yield expressed in the new terms could therefore be higher than if expressed as a barn crop—the actual quantity brought in from the fields.

Technical factors played some role in the change of method of estimating grain crops, but political considerations were probably decisive. One must realize the desperate position in which circumstances placed the Party in the early 'thirties. At the cost of millions of human lives and the good will of almost all peasants, collectivization had been whipped through with prosperity for everybody as the promised goal. Greatly increased productivity of the land was expected to bring this about, so far as agriculture was concerned. But productivity did not increase. Rather, it declined to a point in comparison with which the pre-collectivization level of yield of the small peasant, working with an undersized horse and to some extent with an antiquated plow, appeared quite favorable. This deplorable state of productivity could not be changed overnight, but the method of registering yield and output could readily be altered. The new system was to perform the trick of proving the fulfillment of plans and the achievement of success and prosperity.

Because of the overwhelming importance of grain in the USSR, the grain crops were the first and, for some time, the only ones to which the new method of estimation was applied. This inevitably distorted the normal yield relationships between grain and other crops. The yields of other crops, estimated in the old way as barn crops, became a good clue to actual barn-crop grain yields. But the planners were in no position to think of such fine points.[32]

The fact that the new system of estimating the grain crops had already been introduced when the 2d Plan was approved is, however, the only circumstance which suggests that the goal for the grain yield in 1937 might have been in "biological" terms. The comparison of this goal with those for other crops is enough to induce one to abandon the idea.

[31] See Appendix Note G and pp. 541 ff.

[32] The yields of non-grain crops as a check on official estimates of grain yields since 1933 are used for the first time in this study (see Appendix Note I).

The goals of the 2d Plan for most crops other than grain must be considered fantastic, especially if one remembers that the 2d Plan was not released until November 1934. It is indeed impossible to say which of the goals was most exaggerated—20 tons of sugar beets per hectare, 11 tons of potatoes, 8.5 quintals of sunflower seed, or 3.7 quintals of flax. These impossibly high goals indeed leave no doubt that the goal of 10 quintals for grain was in the old terms of barn yield.

With such abundant yields in prospect, the 2d Plan was able to project a 1932–37 increase in the gross-production value of vegetable products of no less than 85.4 percent—from 9,779 million to 18,133 million 1926–27 rubles. This in turn permitted a relatively favorable projection of the food supplies that were just around the corner.

Yields and output attained.—Cotton continued to yield poorly during the first two years of the 2d Plan Period (Chart 27, p. 508). The turn came when resort was had to the ever effective expedient of paying the producers at least moderately adequate prices. Greatly increased deliveries of commercial fertilizer to cotton producers helped considerably. After 1935, the yield of irrigated cotton skyrocketed; in 1937 it was 23 percent above the goal and about 60 percent above the pre-collectivization yield. Russia's huge and even inexhaustible reserves of everything have been endlessly proclaimed, yet the real potentialities in cotton production based on increased yields were overlooked.

Grain is another crop of which the yield goal was claimed to have been exceeded (official yield 11.5 quintals per hectare, as against a goal of 10). But the barn yield was only about 9.5 quintals in that year. Another thing to be considered is the exceptionally favorable weather in 1937; with normal weather the yield would probably have been below 8.5 quintals or almost negligibly above the pre-collectivization level.

Characteristically, the new method of estimating yields introduced in 1933 and the favorable weather in 1937 were not sufficient to produce the 15 percent "excess" over the goal. A further change in the method of estimating was required. This consisted of eliminating, from the estimates made in the field,

the very inadequate discounts for loss (see pages 518 and 730–31). The need for this later change, which came only four years after the major shift in method, was less pressing than the first, but deviating from the straight road tends to become a habit.

In spite of the very favorable growing conditions of 1937, the yields of sugar beets and potatoes were 8.5 and 13 percent below their respective goals. From 1936 through 1939, sugar-beet yields averaged 15.9 tons per hectare, or less than 10 percent above the 1927 level, and fully 20 percent below the 1937 goal. The showing was even worse in most other crops. The yields of both wild and rotation hay at the end of the 2d Plan Period were not only substantially below the goal, but below the pre-collectivization level as well.

Although acreages remained practically unchanged, the recovery of yields during the 2d Plan Period, with certain crops producing above pre-collectivization levels, resulted in a substantial increase in crop production. But the increase fell far short of expectations. The value of gross crop production, computed in 1926–27 prices, was intended to increase 85.4 percent between 1932 and 1937. Instead, according to official data, it rose 54 percent, in spite of the very favorable growing conditions and the helpful change in the method of calculating grain output. In 1938, the volume of crop production, according to the writer's computation (based on normal weather conditions, with adjustment for change in statistical method), was less than 40 percent above the corrected value for 1932, and 26 percent above the 1928 level (see pages 669–71, and especially Table 53).

3D PLAN PERIOD

Acreages.—The 3d Plan aimed at a total cropped plowland of 147.4 million hectares—a 9.0 percent increase during the five-year period (Table 42, p. 503). This may seem a moderate goal in view of the great increase planned for draft power and draft work (see pp. 453–54), but there was little suitable land into which the acreage could expand.

In 1939, the second year of the Plan, before the war could

have affected agricultural operations, cropped plowland was one percent less than in 1937.[33] Even if the war had not come, the planned expansion for 1942 very likely would not have materialized.

Yields and output.—While the planners did not believe it practicable to schedule more than a moderate expansion of acreages, the 3d Plan continued to be very enthusiastic with reference to increases in yields. In this respect it even went beyond the 2d Plan, the goals of which implied, to a large extent, only the restoration of yield levels achieved twice before—in 1913 and 1928. The 3d Plan, however, had to improve on the 2d Plan's achievements which, except for the still lagging yields of flax, sunflower seed, hay, and possibly vegetables, represented the highest yields ever reached in Russia (Table 43, p. 507). Thus the increases stipulated in the 3d Plan, though relatively smaller, were much more ambitious than those of the 2d Plan. The 3d Plan, indeed, stressed the drive for high yields.

The goal of 13 quintals per hectare (19.3 sixty-pound bushels per acre) for grain was excessive even if it actually had meant a barn yield of only 10.4 quintals (15.5 sixty-pound bushels). A yield of 25 tons of sugar beets would certainly be too high for Russia with the moisture limitations of its sugar-beet areas. Goals of 12.5 tons of potatoes and 9 quintals of sunflower seed must likewise be classed as wishful thinking.[34]

In spite of the unfulfillable goals for acreages and especially yields, the officially computed increase in total crop production during the 3d Plan Period was only 37 percent, a moderate figure for a Soviet plan. The figure would have been higher if

[33] D. Rybalka, "A Powerful Way of Raising Yields," *Socialist Agriculture*, March 1940, p. 30.

[34] The yield goals for grain and certain other crops may have been set at unreasonably high levels partly because the planners felt it necessary to use the abnormally high 1937 yields as the bases and to provide "adequate" increases over these. Furthermore, they may not have realized how far the weather was responsible for the level of yields in 1937, although the low yields of 1938, harvested long before the 3d Plan was approved, were a convincing demonstration that favorable weather had a great deal to do with the relatively high 1937 yields.

It is noteworthy that the low yields of 1932 were replaced by 1928–32 averages as the bases for establishing goals of the 2d Plan (see Table 43, p. 507). With 1937 sufficiently distant, the 1933–37 averages are now used in place of the single year (1937) as the bases vis-à-vis the yield goals of the 3d Plan. The correct procedure would have been to use the *levels* reached by 1932 and 1937, respectively, as the bases both for planning for the future and for appraising the results of the plans.

allowance were made for the favorable weather conditions in the base year.

Evidence on what happened in yields and output after 1937 is scant. If the rising trend of yields continued, it was only at a greatly diminished rate. Soon after the 3d Plan was approved, it became obvious that its yield goals would not be met by wide margins. A way of showing large increases was, however, readily available in the biological-crop estimates, which were now extended from grain to most other crops. The change probably occurred with the 1940 crop, although it may have been made as early as 1939.[35]

A leader in *Socialist Agriculture* claimed: "In one year only, 1940, the production of sugar beets increased by 18.6 percent, of sunflower by 13.2 percent, and of potatoes by 35.6 percent."[36] The writer was too conservative. The time needed to effect this increase was not a year, but the few minutes taken up in using a pen to change the method of crop estimating.

WAR

With all resources already being used to the utmost (see pp. 457–59 on draft power and pp. 388–400 on man power), Soviet agriculture was hit severely by the war. The declines were inevitably large in areas overrun by the enemy, but the setback in territories never occupied also was immense. Indeed, the rate of decline in the never-occupied territory is probably without precedent in history. In only two years, by 1943, it fell nearly or fully 40 percent.

In 1945 the grain acreage of the Union in postwar boundaries was only 85.5 million hectares as against approximately 112 million before the war.[37] The biological grain yield was 7.8 quintals per hectare in the same year, compared with prewar yields of over 10 quintals within the old boundaries, and even more in the added territories. The above figures imply a disastrously low output in 1945 of only 67 million tons (biological

[35] See pp. 731–34.

[36] "The Triumph of Lenin-Stalin Principles of Kolkhoz Organization," *Socialist Agriculture*, January-February, 1945, p. 4.

[37] All data in this section are (directly or by implication) from the *4th Plan* or from the Party decision on restoration of agriculture and Andreev's report, both of February 1947.

crop) or 53.5 million tons (barn crop)—little more than half as much as the present Soviet territory had before the war.[38] Such an output undoubtedly spelled starvation for the people. It certainly did not permit the beginning of the rehabilitation of livestock through substantial feeding of concentrates. It even necessitated economizing heavily on seed, at the expense of the following crop.

The output of sugar beets was down to less than a quarter of prewar in 1945. Output of all fibers was substantially less than half the prewar level, with the cotton situation relatively best and hemp the worst. Excepting vegetables, and possibly potatoes, oilseeds grown for seed only made relatively the best showing. The acreage in potatoes was down 20 percent from the 1938 level, while the output was not much above two-thirds of the prewar level. Only the production of vegetables may have been maintained.

4TH PLAN PERIOD

Acreages.—Except for certain not unimportant changes, the 4th Plan goals for cropped plowland in 1950 repeat those of the 3d Plan (Tables 42 [p. 503] and 45). The 1938 acreage in the pre-1939 territory amounted to 137 million hectares and the added territory had slightly over 15 million hectares, a total of 152–153 million hectares. The 4th Plan calls for 158.6 million—an increase by about 6 million hectares. With the acreage in the new territories retained at the 1938 level, the 3d Plan's goal would have been 163 million hectares. The curtailment of the goal in the 4th Plan is much more likely to have been the result of the experience in 1938–40, when cropped plowland was slowly declining, than an aftermath of war destruction (Table 45). The Plan calls only for a moderate increase of cropped plowland in the East, the main area of expansion. Since all or most of the scheduled increase had already occurred by 1940, the goals of the 4th Plan may be taken as an indication that the expansion of acreages in the East had come to a stop.

[38] The conversion of the biological to barn yield was made on the basis of prewar experience; but it is not improbable that the producers succeeded in concealing part of the crop and that the discount from the biological yield in 1945 did not need to be quite as large as before the war (see pp. 549–50).

TABLE 45.—CROPPED PLOWLAND BY REGIONS, ACTUAL 1938 AND GOAL 1950*

(*Thousand hectares*)

Republic	All crops		Grain		Technical Crops		Potatoes and vegetables		Feed crops	
	1938	1950	1938	1950	1938	1950	1938	1950	1938	1950
USSR total	136,943	158,600	102,411	105,700	10,959	11,900	9,385	12,600	14,102	28,400
RSFSR	94,321	99,400	72,232	68,000	6,225	6,200	6,210	7,400	9,626	17,800
Ukraine	25,601	30,500	17,767	19,600	2,401	2,600	2,101	2,800	3,300	5,400
White Russia	3,337	5,300	2,073	3,200	246	344	670	1,060	324	690
Kazakhstan	6,106	7,286	5,329	5,336	346	340	161	280	270	1,330
Kirghiz	1,022	1,102	799	704	113	108	20	36	89	254
Uzbek	2,832	3,313	1,453	1,371	1,002	1,131	84	112	294	685
Tadjik	800	935	576	633	162	181	21	29	41	92
Turkmen	410	433	189	158	166	161	18	29	38	95
Azerbaidzhan	1,092	1,216	783	825	217	184	39	54	52	153
Georgia	986	937	849	746	51	48	42	44	43	99
Armenia	437	512	362	332	31	40	18	41	26	98
Lithuania	2,332	2,500	1,478	1,600	86	122	212	234	554	550
Latvia	1,945	1,966	1,072	1,105	80	66	195	155	592	640
Estonia	916	981	548	585	23	25	86	109	227	262
Moldavia	...	2,020	...	1,535	...	273	...	82	...	130
Karelo-Finlandia	...	134	...	62	...	...	...	21	...	51

* The 1950 data for the Union as a whole, the Ukraine, White Russia, and, to a smaller extent, the RSFSR, are not comparable with those of 1938 owing to enlargement of the territory. Data for 1938 from *Cropped Plowland USSR, 1938*, various pages, except the Baltic States figures which are from statistics of the respective countries. Data for 1950 from *4th Plan*, except for USSR totals, which are from T. Koval, *To a New Upswing of Grain Production* (Moscow, 1947), p. 9.

The principal changes in the goals of the 4th Plan as compared with the prewar status is in grain and rotation-hay acreages. The 3d Plan called for 102.0 million hectares in grain; the new territories had about 10.5 million before the war—a total of about 112.5 million. The goal of the 4th Plan, however, is only 105.8 million hectares. The reduction in the grain acreage is particularly pronounced in the RSFSR; while the total cropped plowland in 1950 is expected to be 5.1 million hectares greater than in 1938, a cut of 4.2 million hectares in the grain area has been decreed. In Kazakhstan, no part of the additional 1.2 million hectares in crops is to be devoted to grain.

The goals of the 4th Plan for acreages in technical crops are about unchanged from the prewar status. Most of the unprofitable unirrigated cotton had to be omitted; but the acreages in sugar beets, flax, and some minor crops are increased by small amounts.

A moderate increase in the acreage of potatoes and vegetables is planned for 1950, but in substance the projected shifts in acreages will be toward feed; the expansion in total cropped plowland and the acreage taken from grain will go mainly into rotation (especially perennial) grass. This same move was observable in the 3d Plan.

Yields.—So far as concerns the yields of the 4th Plan, one must remember that all of them are definitely expressed in "biological" or—to use the more recent expression—"on-the-root" terms. The goal of the 4th Plan for grain is the only one comparable with yields of the last prewar years, after the prewar yields of the new Soviet territories are expressed in those terms.

The goals of the 4th Plan for yields represent more or less substantial retreats from those of the 3d Plan. All or most of those reductions must be explained by the effects of war. Although the barn yields in the added territories average higher than in the USSR, the goal for grain was reduced from 13 to 12 quintals per hectare—both on the root. The goal for sugar-beet yields was cut from 25 barn tons to 19 tons on the root, and that of flax from 4.6 barn quintals to 4.0 quintals on the root. The goals for the yields of irrigated cotton and for sunflower seed were raised from 19 to 20 quintals and from 9 to 10 quintals,

respectively, but the new yields, properly adjusted for the difference between the barn level of the 3d Plan and the on-the-root level of the 4th Plan, also imply reductions. The goal of the 4th Plan for sugar output applied to the goal for the sugar-beet acreage implies a barn yield of sugar beets of only 14 tons (see page 585), i.e., one ton below the prewar yield. The discounts from on-the-root to barn yields implied in the goals of the 4th Plan for other crops are not to be found. But assuming that they are approximately the same as for grain in prewar years, all known yields, except that of sugar beets, appear higher than the prewar yields, about as follows (in quintals per hectare):

Crop	Goal 1950	Prewar
Grain	9.6	Below 9
Flax fiber	3.2	About 2.8
Irrigated cotton	16.0	15
Sunflower seed	8.0	6 or below

Cotton has the greatest chance of reaching its goal; the chance for sunflower seed is about zero, if present policies are preserved, and the same is largely true of the yield of grain.

No figure has ever been released for the scheduled total crop production in 1950 in either absolute or relative terms. But the expected percentage increases from the 1940 and 1937 levels cannot differ very much from those projected for the total gross agricultural production, namely 27 and 47 percent respectively (see page 674), and like those they cannot be taken seriously. Even the restoration of the prewar level is unlikely.

CHANGES IN REGIONAL DISTRIBUTION OF CROPPED PLOWLAND

1st Plan Period.—The unnatural character of the large increase in cropped plowland during the 1st Plan Period (1927–32) is apparent from the changes in its regional distribution. The cropped plowland increased in 1928–32 as follows (in million hectares):[39]

Northern and Central Russia	5.0
Urals and Bashkiria	2.9
Ukraine	1.5

[39] *Agriculture USSR, 1935*, pp. 213–48. Comparable data for 1927 are not at hand, but no substantial changes occurred from 1927 to 1928.

Middle and Lower Volga	5.7
North Caucasus and Crimea	3.4
West Siberia	−0.7
Kazakhstan	1.1
Central Asia	1.3

In West Siberia cropped plowland actually declined, and the increase was small in Kazakhstan, the other region relatively best supplied with reserve land. Practically all new cropped plowland was in European Russia. A large part of the expansion was in the relatively thinly populated Southeast, which, moreover, by 1928 had not fully recovered from the recession of the war and civil war years. The regions of old habitation also had a large share in the expansion of cropped plowland.

Meliorations were responsible for only minor additions to cropped plowland during the period. Permanent meadows and pastures, a major source of the new land, were plowed up, without making sufficient provision for hay production on arable land. Part of the pasture land that was plowed up in the southeast was submarginal to a high degree. Reduction in fallowing without the accessories that make such change beneficial, was another significant source of acreage expansion.[40]

Changes from 1928 to 1938.—Some of the land taken into cultivation in the turbulent 1st Plan Period was later returned to its former use. Some new land was brought under cultivation. In the aggregate, rather substantial regional shifts in cropped plowland occurred during the 2d Plan Period. But it seems more useful to recapitulate the regional changes in cropped plowland over the years 1928 to 1938 (Table 46).

During this decade, the East emerged as the principal, although not the dominant source of new cropped plowland, with an increase of 8.3 million hectares in the Urals, West Siberia, and Kazakhstan. The expansion of 1.7 million hectares in Central Asia was based on restoration of old and construction of new irrigation facilities. Eastern Siberia also added 0.9 million hectares; one may doubt that people who sowed the additional acreage in this God-forsaken territory went there of their own choice. In the Far East the cropped plowland declined by

[40] See for details V. P. Timoshenko, "Soviet Agricultural Reorganization and the Bread-Grain Situation," *Wheat Studies of the Food Research Institute*, April 1937, XIII, 329–30.

0.3 million hectares (a full quarter of the total), in spite of all efforts to foster agriculture there.

European Russia accounted for more than half of the increase in cropped plowland over the decade, the expansion there being primarily in the Southeast. Part of the increase in this area represented merely the recovery to the 1913 acreage level, which had not been reached by 1928. Some added acreage was submarginal. The rest came from regular meadows and pastures.

TABLE 46.—CROPPED PLOWLAND BY REGIONS, 1928 AND 1938*

(*Million hectares*)

Region	1928	1938
European North	1.4	1.6
Northwest	5.0	5.9
Central	12.2	13.8
Central Chernozem	10.1	10.7
Upper Volga	6.5	8.0
Volga	8.8	12.7
North Caucasus	10.2	13.7
Ural	9.1	13.0
West Siberia	7.8	10.3
East Siberia	2.7	3.7
Far East	1.2	0.9
Ukraine	24.9	25.6
White Russia	3.4	3.3
South Caucasus	2.1	2.5
Central Asia	3.4	5.1
Kazakhstan	4.2	6.1

* From I. D. Laptev, *Location of the Soviet Grain Production* (Moscow, 1940), p. 61. Most of these "regions" represent non-administrative groupings of oblasti, kraya, or republics.

The Ukraine shows a slight increase in cropped plowland only because the 1928 acreage was reduced by extensive winterkilling not fully resown. Actually, cropped plowland there was overexpanded before 1928.

That Central and Northern European Russia, the previously neglected areas of old settlement, had to be looked upon more and more as a source of new arable land, is attested by the following statement:

Whereas the increase of cropped plowland in the 1st Plan Period occurred mainly in the southern and eastern areas, in the 2d Plan Period the principal expansion is expected in northern and central areas and in Siberia.

From the whole increase in cropped plowland 67.8 percent occurs in the consuming zone.[41]

Of course, the limited land resources in Central and Northern European Russia did not permit spectacular expansion. Still, the cropped plowland of those regions and South Caucasus showed an increase of 3.0 million hectares in the decade; the increase in the Upper Volga region of 23 percent—if this figure of Laptev's in Table 46 is correct—must be recognized as very large for such an old territory.

3d and 4th Plan Periods.—With the ever-increasing stabilization of the total cropped-plowland area, the interregional shifts and changes within individual regions are greatly diminishing. The RSFSR includes West and East Siberia and the Far East, as well as most of Central and Northern European Russia. The 4th Plan projects for this vast territory a cropped plowland in 1950 only 5.1 million hectares larger than in 1938 (Table 45, p. 524).[42] The increase planned specifically for West Siberia, formerly the principal area of colonization, cannot be large. Even in Kazakhstan, the last resort for colonization,[43] cropped plowland in 1950 is not expected to exceed the 1938 area by more than 1.2 million hectares, and probably all of this increase had occurred by 1941. The entire south and southeast has reached a stabilization point.

Since the universal shortages will greatly limit any large-scale land improvements during the 4th Plan Period, little new cropped plowland will be added in this way. The principal areas with irrigated land are expected to have 869,000 hectares more cropped plowland in 1950 than in 1938; of this, 719,000 hectares are in Central Asia and 150,000 hectares in South Caucasus. Some expansion is probably expected in Northern and Central European Russia through forest clearance and swamp drainage.

CROPPED PLOWLAND BY CROP GROUPS: RECAPITULATION

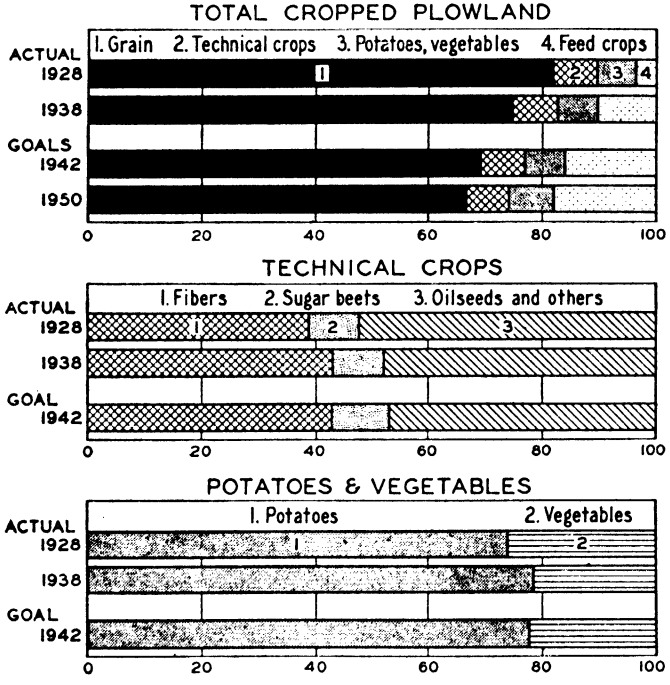
After having considered the regional changes in cropped plowland, it may be useful to recapitulate the changes in the

[41] *Draft of 2d Plan*, I, 208–09.
[42] A small portion of this increase is accounted for by territory added to the RSFSR.
[43] Except for the limited area under irrigation, Kazakhstan has no good land.

distribution of cropped plowland among individual crops (Chart 29). Substantial improvements were affected in this respect during the period 1928–38, although the significance of the changes is not so great as the official commentators try to make it appear.

CHART 29.—CROPPED PLOWLAND BY GROUPS OF CROPS AND BY MAJOR CROPS, 1928, 1938, AND GOALS FOR 1942 AND 1950*

(Percent of specified group total)



* Data in Chart Appendix. 1950 goals for enlarged territory.

One of the principal improvements was the decline in the proportion of plowland in grain, from 81.9 percent in 1928 to 74.8 percent in 1938.[44] Fully two-thirds of this decrease was reflected in the great expansion of rotation grass, from 3.6 million hectares in 1928 to 12.7 million in 1938 (Chart 25, p. 505).

The crops other than grain and rotation grass occupied 21.8

[44] The decline would have been somewhat larger if heavy winterkilling of the 1928 crop had not reduced the grain area of that year to a subnormal percentage of total cropped plowland.

million hectares in 1938 as against 17.2 million in 1928. Of the increase of almost 5 million hectares in these crops, 2.3 million were accounted for by technical crops, 1.7 million by potatoes and vegetables, and one million by feed roots and silage crops.

Significant changes occurred, furthermore, within the group of technical crops, and in potatoes and vegetables. The increase in the fiber acreage was as large as that in all technical crops. The sugar-beet area was expanded by half a million hectares, and there were also increases in certain minor crops such as tobacco. The failure of the plans for oilseeds was a great disappointment, blasting, as it did, the goals for food fat, soap, and so on. However, the large decline in the oilseed acreage could be considered a serious disadvantage only in an economy striving for self-sufficiency. Vegetable oil can be imported at reasonable prices, and from an agricultural standpoint oilseeds are not valuable crops under Russian conditions. The return per acre is small, and the USSR's principal oilseed, the sunflower, is hard on the soil and adversely affects the yields of crops grown after it in rotation. Fibers and sugar beets, whose acreages did expand, are certainly more valuable than oilseeds.

The potato acreage expanded, but the acreage in vegetables remained unchanged—the vast expansion goals notwithstanding. There was, however, a substantial shift from low-yielding to high-yielding vegetables.

The 3d and 4th Plans specified changes in the distribution of cropped plowland in directions taken before. The share of grain in the total acreage is expected to decline to 66.7 percent in 1950 as against 74.8 percent in 1938, 70 percent of the released land going into rotation grass. Potatoes and vegetables are the only other group scheduled to increase their share in total acreage.

CHAPTER XXII

GRAIN

Bread is the only material good mentioned in the Lord's Prayer. In a broad sense, the degree of importance of bread or bread grain in the life of a people is a good indicator of the cultural or, at least, economic level of the country. The higher that level the less is bread aptly termed the staff of life. To 99 out of 100 Americans the thought never occurs that "Give us this day our daily bread" could be a literal request. In the USSR, the share of grain in the output of all goods declined considerably during the 'thirties, though its share in agricultural output remained about unchanged. But as a literal object in the daily thought and prayer of the Soviet people, bread rose sharply in importance over the period. At the end of the war and through the 1946–47 crop year bread was as scarce as in the worst years of Russian history. Yet bread is still of prime importance in the Russian diet, and prospects for a lesser role for it are not promising.

ACREAGES

Grain acreages expanded from 92.2 million hectares in 1928 to 104.7 million in 1934.[1] This has proved the peak thus far, and it will continue to be for some years, probably forever (Chart 30). The shift of crop raising to the Southeast and into Asia was naturally more pronounced in grain acreages than in all cropped plowland.

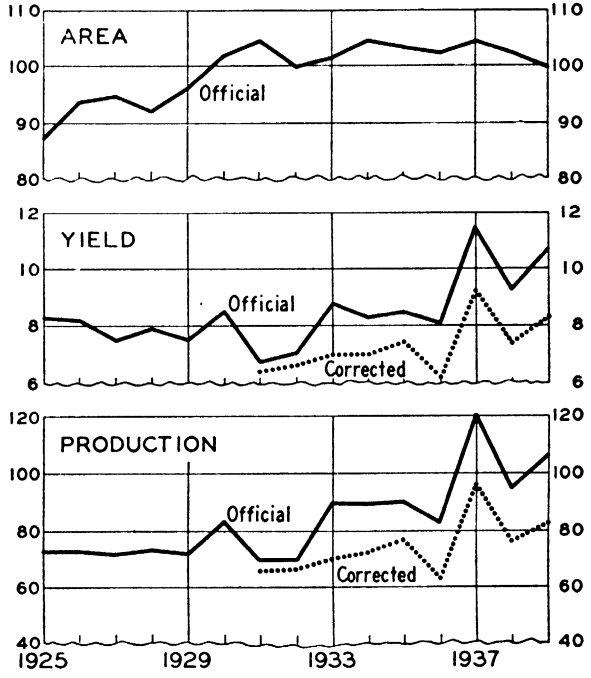
In 1938 the land in grain amounted to only 102.4 million hectares, and the 3d Plan, prepared in that year, provided for stabilization at that level. But the area fell slightly below 100 million in 1939[2] and 1940. It amounted to around 85 million hectares in the enlarged territory in 1945, and the 4th Plan calls

[1] See below on the possibility that the acreages of the early 'thirties were overestimated.

[2] It was 99,653,000 hectares in 1939, according to D. Rybalka, "A Powerful Way for Raising Yields," *Socialist Agriculture*, March 1940, p. 30.

for 105.7 million hectares in grain for 1950.[3] This implies about 95 million within the 1938 boundaries—a decline from even the 1939 and 1940 levels. This reduction of the grain acreage is due not to an expected shortage of draft and man power, but to the desire to divert more land to rotation grass (see p. 525).

CHART 30.—GRAIN: AREA, YIELD, AND PRODUCTION, 1925–39*
(*Million hectares; quintals per hectare; million tons*)



* Data in Chart Appendix.

Wheat and rye.—The principal change in the distribution of the various grains in the 1928–38 decade was the large increase in the wheat acreage from 30 to 40.5 percent of the total grain acreage (Chart 31). This development was at first a continuation of recovery to the status reached by 1914, but the expansion went beyond that level.

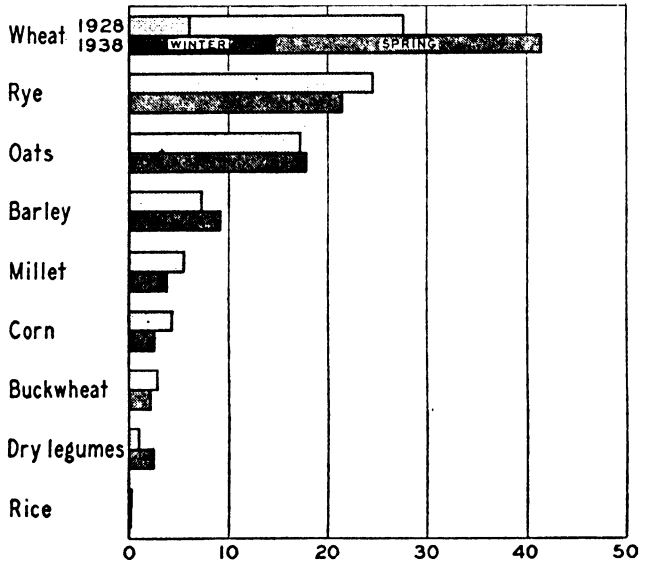
The continued increase of cropped plowland in the Southeast and in Siberia—areas particularly adapted to wheat—was the

[3] *4th Plan*; A. A. Andreev, "On Measures to Raise Agriculture in the Postwar Period": Report to the Central Committee of the Party, February 1947 (see *Socialist Agriculture*, Mar. 7, 1947); and *Socialist Agriculture*, Apr. 15, 1947.

principal factor in the further expansion of wheat acreages. The replacement of rye by wheat in southern European Russia also continued a process that had been in progress for decades.[4] The penetration of wheat into the non-Chernozem zone of northern and central European Russia—a Soviet innovation of which the Communists are very proud—accounted for about one-sixth of the total increase in the wheat acreage from 1928 to 1938.

CHART 31.—GRAIN AREAS, 1928 AND 1938*

(Million hectares)



* Data in Chart Appendix.

The great efforts to expand wheat growing in the non-Chernozem zone are largely the result of the fact that the natural wheat areas, the chernozem and chestnut soils, cannot be relied upon to cover the need for this grain. The policy directed toward regional self-sufficiency in food may also have been a factor. The efforts will not be crowned with real success, however, until much more of the soil of the non-Chernozem zone is made suitable for wheat by liming and large humus accumulation (see Appendix Note F).

[4] For a much more detailed analysis of the shifts from rye to wheat, see the two studies by V. P. Timoshenko, *Agricultural Russia and the Wheat Problem* (Stanford University, Calif., 1932), chap. viii, and "Soviet Agricultural Reorganization and the Bread-Grain Situation," *Wheat Studies of the Food Research Institute*, April 1937, XIII, 334–37.

A significant feature of the 3d Plan was that it put an end to the rapid expansion of wheat acreage in the USSR. It called for an increase of less than one million hectares—from 41.4 million to 42.3 million. The area in spring wheat—the crop that dominated in the eastward movement of colonization and grain production—was even marked for a decline of one million hectares,[5] a circumstance that certainly denies the existence of vast stretches of virgin land adapted to wheat or any other plowed crop.

In pre-Revolutionary times the durum wheats of the Southeast were famous. While keenly sought by Italy for macaroni, they enjoyed a high standing in Russia itself as material for breadmaking.[6] Conditions after the Revolution, and especially during the collectivization drive, were not favorable for this crop; it is rather exacting, owing to specific properties this wheat must possess to yield the desired results. The 1940 area has been estimated at only "above 4 million hectares."[7]

Perhaps three-quarters of the decline in grain acreage between 1940 and 1945 was in wheat. Winter wheat, practically all of it grown in enemy-occupied territory, naturally suffered a great setback. But the acreage in spring wheat also declined sharply, partly through replacement by the inferior millet and by winter rye. Special campaigns have been inaugurated to bring about a rapid recovery of the spring-wheat acreage.

Oats, corn, buckwheat, and millet.—The fact that the oat acreage remained unchanged during the 'thirties (Chart 31), in spite of the great decline in numbers of horses for which oats is the preferred feed, is a feature that can be observed in other countries, including the United States. Oats is very difficult to replace on certain widely distributed soils and in many widespread rotations.

The corn area fell from 4.4 million hectares in 1928 to 2.6 million in 1938, instead of increasing to at least 10 million as provided by a directive of the Commissariat of Agriculture in 1930–31 (see pp. 503–04). This reversal was not so much the

[5] *3d Plan*, p. 219.

[6] See Naum Jasny, "Der Russische Weizen," *Landwirtschaftliche Jahrbücher*, 1926, LXIII, 411–61.

[7] *Socialist Agriculture*, Aug. 7, 1946.

result of the overestimation of the adaptability of corn to Russian conditions in the 'twenties[8] as of the failure of socialized agriculture to master the techniques of corn growing (see page 428).

Buckwheat, a rather low-yielding crop, occupied a smaller acreage in 1938 than in 1928. Under normal conditions the decline of the acreage in buckwheat would be hailed as a definite improvement, for it represents a lower scale of culture and diet than most other grains. The crop is grown chiefly because it is satisfied with the poorest land and may be sown later in the spring, thus allowing more time for preparation of the soil. The decline, however, was extremely regretted under the conditions that prevailed in the USSR in the 'thirties. The shortage of all kinds of food brought about a great and urgent demand for porridge grains, especially buckwheat, long the Russians' favorite. The 2d Plan aimed at an increase in buckwheat from 1,662,000 hectares in 1932 to 2,000,000 hectares in 1937.[9] To encourage this expansion, the price paid for buckwheat was raised considerably, relative to prices of other grains (see page 375). An even greater expansion of the acreage in buckwheat, because of a large decline during the war (probably to around one million hectares), was urged by the decision of the Party of February 1947.

Millet, a crop that is inversely sensitive to reduction of draft power, crop failures, and other cultural difficulties, responded to the troubled conditions of the 1st Plan Period with an upswing from 5.7 million hectares in 1928 to 8.9 million in 1933. It dropped afterwards to 3.9 million hectares in 1938, below the pre-collectivization level but above that of 1913. As in the case of buckwheat, the decline in output of millet was deprecated, but enlarged production was sought primarily through increased yields.[10] The area in millet expanded so greatly in the war years

[8] The writer in due time warned against this overestimation. See *Encyclopedia of Russian Exports* (1st ed., Berlin, 1924), I, 260 ff.

[9] *2d Plan*, I, 468.

[10] T. D. Lysenko, the leading Soviet plant breeder, advanced the theory that millet was the most prolific grain crop. The reason given was that the plant carries the kernels in a panicle rather than in a head. (One would think that the fact that each millet plant produces many times as many kernels as a wheat plant, for example, is sufficiently reflected in the low seeding rate of millet.) The fact that the millet kernels are enclosed in a thick hull and have therefore a small nutritive value is ignored. No new developments in breeding

that the Soviet press strongly avoids revealing its size. In 1945 and 1946, millet may have occupied over 10 million hectares.

Rice.—The USSR has no such abundance of water for irrigation that rice would have a comparative advantage for a large share in irrigated land. Of the 230,000 hectares in rice in 1927, 144,000 hectares were in Central Asia, 55,000 in Azerbaidzhan, and 16,500 in the Far East.

The acreage in rice declined by almost one-half (to 122,300 hectares) in 1932. The usual complaints of harmful activities by enemies of the country were made in explanation.[11] The situation remained very unfavorable until 1936,[12] and later recovery was small. Only 156,200 hectares were in rice in 1937, though the goal of the 2d Plan was 270,000 hectares. While the 3d Plan stipulated a return to the pre-collectivization acreage, only 10,600 hectares were added to the rice acreage in the first two years of the 3d Plan Period.[13]

A noteworthy development in rice in recent years has been its northward movement, although on a small scale, into North Caucasus and even into southern Ukraine. For the first time, rice growing in North Caucasus was registered in the statistics in 1931; by 1939 it had reached 8,800 hectares. The Ukrainian statistics showed no rice before 1937, but 1,600 hectares were reported in 1939. A preliminary plan for 1942 projected a rice area of 58,600 hectares in those two regions. The planned expansion in the new rice areas obviously implied that the 3d Plan did not expect the acreage in the old rice areas, Central Asia and Azerbaidzhan, to reach the pre-collectivization level.

Since the total area in rice in 1946 is reported as 135,000

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are claimed. The whole of Lysenko's secret—one thousand years old—is to seed millet in wide rows permitting repeated and thorough weeding, which, under Russian conditions, must be done primarily or exclusively by hand. Special millet acreages were sown under the auspices (involving a kind of supervision) of the All-Union Academy of Agricultural Sciences, of which Lysenko is president, in 1939 and 1940. In the desperate postwar conditions the same measure must be conducted on an expanded scale (one million hectares in 1947). See Academician T. D. Lysenko, "To Raise Sharply the Yield of Millet," *Socialist Agriculture*, Apr. 15, 1947.

[11] G. Barsukov, "The Problem of Rice Growing in the USSR," *Socialist Agriculture*, April 1940, p. 90.

[12] On the situation in rice sovkhozy, see *Agriculture USSR, 1935*, pp. 1101–02. On the average in 1932, the sovkhozy delivered to the state only 7.5 quintals per hectare; their rice acreage declined from 15,600 hectares in 1932 to 5,945 hectares in 1935.

[13] *Socialist Agriculture*, March 1940, p. 31.

hectares, the decline during the war years is revealed as relatively moderate.

Dry legumes.—The area in dry legumes increased from 891,000 hectares in 1928 to 2,128,000 in 1932 and to 2,891,400 in 1937, the goal for 1937 having been 3,575,000.[14] The large increase represented the replacement of output by areas lost after World War I to Poland; those areas had been the chief producers of dry legumes in Czarist Russia. A special reason for promoting the expansion of these crops was the realization that the plans to provide the population with large quantities of animal proteins had little chance of fulfillment, and that it would be wise to have a substitute at least in the inferior dry legumes. Although the former dry-legume areas were regained and more such areas added, only one million hectares were in dry legumes in 1946.[15]

YIELDS AND OUTPUTS

While the official figures on grain acreages in the early 'thirties are open to question (see p. 539), they may at least be used as the basis of discussion. In the case of yields and outputs, on the other hand, one must take the unpleasant plunge into a mass of checking and estimating, including analysis of technicalities of crop estimating, and arrive as best one can at something approximating the truth. While the bulk of the technical discussion has been relegated to Appendix Notes, the material which, in the writer's estimation, was too pertinent to be omitted from the text is still unavoidably lengthy and involved.

Official estimates, 1929 to 1932.—The tabulation on page 539 shows yields and production of grain during the 1st Plan Period, compared with goals and years immediately preceding. The below-average yield of 1929 was due to somewhat unsatisfactory weather conditions. The weather, however, was favorable in 1930, and this fact overcompensated for the adverse effects of the collectivization drive, which, moreover, did not appear all at once. Whether it was enough to boost the grain yield to 8.5 quintals may be doubted. The kolkhozy are sup-

[14] *2d Plan*, I, 468.

[15] *Socialist Agriculture*, Apr. 15, 1947.

posed to have averaged 8.3 quintals in what was for most of them the first year of their existence.

Year	Yield (*quintals per hectare*)	Production (*million tons*)
1925	8.3	72.7
1926	8.2	76.6
1927	7.5	71.7
1928	7.9	73.3
1925–28 average	8.0	73.6
Goal of the 1st Plan for 1932		
Basic	8.9	99.7
Maximum	9.5	105.9
1929	7.5	71.7
1930	8.5	83.5
1931	6.7	69.5
1932	7.0	69.9

The 1931 season was slightly below average climatically, and the sowings of the kolkhozy were more than doubled in one year. The results were—even according to official computations—a yield of only 6.7 quintals per hectare, about 16 percent below the pre-collectivization level. The 1932 season had about average weather, but the yield was reported to have improved only to 7.0 quintals per hectare—12.5 percent below average. Since an expansion of about 10 percent in area was officially indicated, the crops of those years were estimated at only about 5 percent below the pre-collectivization level—69.5 million tons in 1931 and 69.9 million tons in 1932. Such a moderate decline, however, is inconsistent with the catastrophic food situation and the great contraction in the use of grain for feeding the decimated livestock herds in those years.

The utilization of grain for all purposes (other than increase of carryover, which certainly did not occur) in 1932 is here estimated at 64.5 million tons (Chart 32, p. 551; for details see Appendix Note J). Evidence presented later in this chapter makes it very probable that 64.5 million is an overestimate. Writing in 1932, my colleague expressed the belief that the grain acreages of both 1930 and 1931 were overestimated, but in a later study he was much less positive on this score.[16]

[16] V. P. Timoshenko, *Agricultural Russia and the Wheat Problem*, p. 174, and "Soviet Agricultural Reorganization . . . . ," p. 328.

The borderline between overestimation of acreages and yields is difficult to place exactly under conditions such as prevailed in 1932. How, for example, should one treat fields sown only *pro forma* in order that fulfillment of plan might be reported? The present writer prefers to leave the question open as to whether the overestimation was in acreages, yields or both.

A discount of 5 percent from the official production figures for 1931 and 1932 is accepted here (Chart 30, p. 533), although the necessity of a 10 percent discount is very probable.[17] So estimated, the 1932 grain output was around 10 percent below that of 1927–28.

Yields of the socialized and private sectors, 1931 and 1932.— So far as an overestimation of the grain output in the early 'thirties occurred, the socialized sector is likely to have been the one mainly or exclusively involved. To check the accuracy of acreages officially assigned to each of the two sectors is impossible; hence it would be useless to present the figures here. However, the comparative data on yields merit examination. The officially reported yields of grain obtained by the several producer groups in 1931 and 1932 are shown below, compared with the respective goals set by the 1st Plan (quintals per hectare):

Producer category	1931[a]	1932[a]	Goal for 1932[b]	
			Basic	Maximum
All producers	6.7	7.0	8.9	9.5
Kolkhozy	6.3	6.8	10.1	11.3
Sovkhozy	5.9	7.2	11.1	12.5
Individual and kolkhoz peasants	7.5	7.7	8.7	9.2

[a] *Agriculture USSR, 1935*, pp. 267 and 269.
[b] *1st Plan*, II, Part 1, pp. 328–29.

The early 'thirties were not a propitious time for the private sector—the individual peasants and kolkhozniki—to raise their yields. The liquidated kulaki and well-to-do peasants had generally obtained the highest yields. Many peasants still operating as individual producers had less draft power than before the collectivization drive started, having liquidated part of their

[17] Otto Schiller, *Die Landwirtschaftspolitik der Sowjets und ihre Ergebnisse* (Berlin, 1943), p. 119, estimated the 1932 crop at only 50 to 55 million tons, i.e., at 21.3 to 28.5 percent below the official estimate. Schiller was in Moscow as Germany's agricultural attaché in those years.

stock rather than surrender it to the kolkhoz in case they were compelled to join. As shown by the above tabulation, the yields obtained by the private sector in 1931 and 1932 were about 25 percent below the maximum goal of the 1st Plan but were close to the normal pre-collectivization yields of eight quintals per hectare. The registered decline of about 5 percent from that level is probably an adequate reflection of the deterioration of production conditions for that sector of producers.

The kolkhoz and sovkhoz economy, on the other hand, was in a state of complete confusion. While most of the peasants joining the kolkhozy did not have horses, the horses taken from the kulaki were dying from lack of food and care. Since there were only a few tractors, the total supply of draft power was greatly inadequate (Chart 26, p. 506). Poor cultivation of the kolkhoz and sovkhoz land and serious delays in seeding and harvesting are a matter of record (see pp. 510–12). The yields obtained by the socialized sector may well have been substantially smaller than indicated above, for the government must have been extremely reluctant to admit much lower yields from socialized than from private enterprises.

Biological-crop estimates, 1933–36.—Whether the discounts needed to correct the official estimates of grain production in the early 'thirties were 5 or 10 percent, they were moderate as compared to what followed. As a Russian saying goes, those were the flowers, the berries had yet to come. It was shown in the preceding chapter that the desperate situation in which the USSR was plunged by the socialization of agriculture led to the introduction in 1933 of a system of estimating grain yields and crops which gave higher figures than would have resulted from the old system of estimates. The new system is discussed in detail in Appendix Note G, but a brief summary is appropriate here.

Until 1933 the Union had the usual system of crop estimating, which aimed at determining the amounts actually harvested. The results were customarily referred to as barn crops. The final determination occurred after the crops had been harvested. The preliminary estimates, made before the start of harvesting or before threshing was finished, merely attempted to anticipate

the forthcoming barn crops. But from 1933 on, this system, as applied to grain, was replaced by the determination of the crop available in the field before harvest. The crop thus estimated was referred to as the biological crop; its official designation now is "crop on the root." From 1933 through 1936, discounts for losses before and during harvest, not exceeding 10 percent, were permitted and probably made in all or most cases. The fact that the discounts have apparently been discontinued since the 1937 crop makes it advisable to discuss the period 1933–36 separately.

The officially announced yields and outputs of grain in 1933 through 1936, as compared with those of the preceding years, and the goals for 1937 were as follows:

Year	Weather	Quintals per hectare	Million tons
Old system			
1925–29 average.....	.....	7.8	73.6
1930	Favorable	8.5	83.5
1931	Below medium	6.7	69.5
1932	About medium	7.0	69.9
1931–32 average.....	Almost medium	6.85	69.7
New system			
1933	Favorable	8.8	89.8
1934	Medium	8.5	89.4
1935	Favorable	8.7	90.1
1936	Very poor	8.1	83.0
1933–36 average.....	.....	8.5	88.1
Goal of 2d Plan, 1937..	.....	10.0	104.8

The great jump in yields immediately after the change in method of estimating is unmistakable. Instead of being substantially below the pre-collectivization level, as in 1931 and 1932, the yields turned out to be higher in every year beginning in 1933, although it is by no means certain that the disorganization had reached its worst before 1933. After recovery began, it proceeded slowly. Draft power was not restored to the pre-collectivization level before 1937 (Chart 26, p. 506). Weeds continued to infest the fields until the war came.

Although growing conditions were more favorable for the 1933 crop than for 1931 and 1932, the difference could have

been responsible for only a small increase in yield—certainly not the two quintals per hectare indicated by the official data. Also, the barn crop in such a poor year as 1936 could not possibly have exceeded the pre-collectivization level.

The necessity of a discount from the official estimates of the grain crops of 1933 and later years had been recognized by all independent observers such as S. N. Prokopovicz, Murray Ross, V. P. Timoshenko, and Lazar Volin. The discount most frequently suggested was 10 percent.[18] The writer believes that the truth would be more closely approximated if this percentage were doubled. This is shown by the following analysis.

Barn crops, 1933–36.—Three different approaches (the so-called mixed approach, reconstruction method, and utilization) were employed by the writer to ascertain the barn crops of 1933–36 and those of 1937–39 as well. As an additional check, the average barn yields of grain in those years, as here computed, are compared with the yields of other products also estimated in barn-crop terms. The details of the analysis are presented in Appendix Notes H, I, and J. In this work the writer followed in the footsteps of the statisticians of the Gosplan of the period up to the publication of the *1st Plan*, and is reasonably confident that the conclusions reached here would be accepted by them.

The "mixed" approach consists of adding reported government procurements of grain from the kolkhozy and the quantities distributed by the kolkhozy to the kolkhozniki to the estimated quantities used by the kolkhozy for other needs. To the total thus obtained—the kolkhoz crop—is added the estimated non-kolkhoz crop (Table 61, p. 745). By this procedure, estimates of the four crops, 1933–36, are secured.

The second approach utilizes statements of Soviet officials who know the barn crops of the kolkhozy from the accounts of the kolkhozy themselves. By reconstruction, these statements reveal the kolkhoz barn crops of 1937 through 1939. Other statements of the same sort make it possible to carry the series back to 1935. To the kolkhoz crops thus obtained are again added the non-kolkhoz crops (Appendix Note H).

[18] S. N. Prokopovicz, *Russlands Volkswirtschaft unter den Sowjets* (Zürich, 1944), pp. 358–59; V. P. Timoshenko, "Soviet Agricultural Reorganization . . . . ," pp. 343–44.

The third approach makes use of the writer's estimate of probable average utilization during the period 1933–34 to 1936–37 and 1938 (Appendix Note J). It must be noted that, unlike the computation of utilization, the estimates obtained by the mixed approach do not need a special provision for increases in carryover, because these took place exclusively or mainly in government stocks, obtained from supplies considered in the computation. Neither do the crop figures obtained by reconstruction need such adjustment.

Official estimates of grain acreages for appropriate years are applied to the various output figures to obtain yields per hectare. The following tabulation compares the findings for 1933–36 with official crop and yield estimates:

Year	Official estimates	Mixed approach	Reconstruction approach	Utilization approach
	Production (million tons)			
1933	89.8	68.2	....	....
1934	89.4	74.4	....	....
1935	90.1	77.1	75.2	....
1936	83.0	65.5	59.8	....
1933–36 average	88.1	71.3	....	70.5
	Yield (quintals per hectare)			
1933	8.8	6.7	...	...
1934	8.5	7.1	...	...
1935	8.7	7.5	7.3	...
1936	8.1	6.4	5.8	...
1933–36 average	8.5	6.9	...	6.8

The different approaches provide checks upon one another in 1935, 1936, and the 1933–36 average. In the first and last of these the results are close, and even in 1936 the discrepancy between the derived figures does not appear large in comparison with the great differences between these figures and the official estimates.

The data tabulated above lead to the inference that the barn crops of 1933–36 were on the average around 20 percent below

the official estimates, with a variation of the necessary discount from around 15 percent (1935 crop) to around 25 percent (1936 crop).[19]

Provided the official estimates of acreages are correct, the computed discounts from the official crop data apply also to yields. In Chart 30 (p. 533) the barn yields were assumed to have been 6.9 quintals in 1933 and 1934, 7.4 quintals in 1935, and 6.2 quintals in 1936.

The outputs and yields computed here for 1933–36 on the average amounted to 70.6 million tons and 6.85 quintals per hectare respectively (see Chart-Table 30, p. 793). The former figure is a few percent below the pre-collectivization level, the second about 15 percent below it. The figure for output is almost exactly that obtained by analysis of utilization.

In view of the deterioration in production techniques discussed on pages 510–12, a decline in yield by 15 percent from the pre-collectivization level seems reasonable. By contrast, the assumption of a needed discount from the official yield figures of only 10 percent (suggested by some other writers; see above, p. 543) implies that in 1933–36 the yield averaged only 5 percent below the pre-collectivization level—an obviously inadequate allowance for the observed deterioration in production techniques. In Appendix Note I, the computed decline of the 1933–36 yields from the pre-collectivization level is compared with similar declines in the yields of certain other crops in the same period, determined in the old way. The result of the comparison is that the revised grain yields are in close agreement with the official yields of the other crops.

It was mentioned that discounts of 10 percent from the official estimates in the field were permitted and, in most cases, probably made. It is found that a further average discount of about 20 percent is needed to bring the official yields down to the barn level. Hence the total needed discounts from the estimates in the field are likely to exceed 25 percent. Evidence on harvesting losses (see pages 729–30) suggests that the losses were not as large as this. If so, the crops were overestimated

[19] Schiller (*op. cit.*, p. 119) gives production estimates considerably below the writer's for 1933 to 1935: 60–65 million tons for 1933, 65–70 million for 1934, and 72 million for 1935.

even in the field. This finding is not surprising in view of the uncertainties inevitable in the determination of unharvested crops and the general tendency toward overestimation that prevails in the Soviet statistics.

A significant yet easily neglected feature of the findings in Appendix Note H is that the discount from the official estimates needed to arrive at barn yields was much larger for the poor 1936 crop than for the relatively good 1935 crop (26 percent as against 16). By the simple expedient of overestimating the poor crop more than the good one, the large year-to-year variations inevitable under Russian climatic conditions were eliminated to a considerable degree, and the claim was made that the socialist economy does away with the hazards that weather imposes.

Official estimates, 1937–39.—The mixed method of determining the barn crops described above indicates that the average yield of grain in 1935 and 1936 was about the same as the average for 1933 and 1934 (p. 545). This was the result of exceptionally unfavorable weather for the 1936 crop. With similar weather conditions, the barn yields of 1935 and 1936 would certainly have shown a measurable or even marked improvement over those of the preceding two years.

The trend toward improved yields continued also after 1936. The system of crop estimating used in 1933–36, however, was such that the improvements actually attained could not be fully reflected in the official estimates. Had the method of estimating remained unchanged, the official estimates could have registered only the improvements resulting from better cultivation, and not the reductions in harvesting losses brought about by more timely harvesting and increased use of the combine. These would show up only in the barn yields and crops. This was prob-

Year	Weather	Yield (*quintals per hectare*)	Production (*million tons*)
1933–36 average	....	8.5	88.1
Goal of the 2d Plan for 1937	....	10.0	104.8
1937	Excellent	11.5	120.3
1938	Poor	9.3	94.9
1939	Below medium	10.7	106.5
1937–39 average	....	10.5	107.2

ably the reason that the system of estimating grain crops was changed again. The tabulation below, which shows the official estimates of yields and crops in 1937–39 compared with the 1933–36 average and the goal of the 2d Plan for 1937, indicates that this change most probably occurred in 1937.

Owing to the rising trend of yields, an increase of 24 percent between the periods 1933–36 and 1937–39 would not have been impossible, especially in view of excellent weather conditions in 1937. But an increase of this magnitude could have occurred only in the actual or barn yields. The existing crop-estimating system could not have shown so large an increase, owing to its failure to reflect the decline in harvesting losses. The writer infers that 1937, like 1933, started a series of yields that are on a new and higher plane than those of the preceding period. Had the 1937 yield been estimated in the same way as in 1935—another year of climatically favorable weather—no such increase as the 32 percent indicated by the official estimate would have been possible.

Some time before July 21, 1939 all discounts from the estimates of the grain crops in the field were eliminated. After that change the estimated crops are supposed to include every actual loss that may have occurred to the crop—indeed, to represent the total crop available in the field some time prior to the start of the harvest (see pages 730–31). The jump in official yields in 1937, obviously in excess of any increase that good weather and improved techniques alone could have caused, with great probability establishes that crop as the first to be estimated without any discounts from the appraisals in the field.

The first change in the method of estimating grain crops occurred in 1933, the first year of the 2d Plan Period—too late to enhance the achievements of the 1st Plan Period. The second change in statistical method was made early enough to demonstrate the success of the 2d Plan.[20]

[20] The fact that two high officials, S. F. Demidov (*Development of Agriculture in the Postwar Five-Year Period*, Moscow, 1946, p. 14) and N. I. Anisimov (*Victory of Socialist Agriculture*, Moscow, 1947, p. 56), used 9.1 quintals as the average yield of grain in 1933–37 indicates that 120 million tons still stood as the official estimate of the 1937 grain crop. Then another high-ranking person, T. L. Basyuk, in the 3d edition of his *Organization of Socialist Agriculture* (Moscow, 1947), pp. 251 and 252, came out with an average yield for that period of 8.9 quintals and itemized grain-production estimates for 1937 totaling

Barn crops, 1937–39.—Actual grain crops and yields as reconstructed from statements of Soviet writers (see Appendix Note H) compare as follows with official figures:

Year	Official data	Reconstructed data	Implied percentage discount
	Production (million tons)		
1937	120.3	96	20
1938	94.9	76	20
1939	106.5	82	23
Average	107.2	85	21
	Yield (quintals per hectare)		
1937	11.5	9.2	20
1938	9.3	7.4	20
1939	10.7	8.2	23
Average	10.5	8.3	21

The barn yields thus obtained are moderately above the pre-collectivization level. The same result is reached by the analysis of grain utilization in Appendix Note J. The computation made for 1938, but broadly applicable to the period 1937–38 to 1939–40, indicates an annual utilization, other than for increase in carryover, of around 80 million tons. Since the grain acreage was around 100 million hectares in those years, a yield of exactly 8 quintals per hectare—the average pre-collectivization yield—was needed to provide for the current utilization. The carryover increased greatly from the beginning of the crop year 1937–38 to the end of the crop year 1940–41. However, if this large increase were divided among the four years, the annual increase probably would represent only a small percentage of the average crop. Consequently, it is only by this small percentage that the grain yields of 1937 to 1939 or to 1940 exceeded the pre-collectivization level. By comparison, the official yield figures imply an increase of 30 percent.

The crop data obtained by the reconstruction method, though very close to those based on utilization, are consistently lower.

only 114 million tons. One can only wonder how, after 10 years, a figure can be revised that was based on the stand in the field at a given date. Simply, *der Mohr hat seine Schuldigkeit getan, der Mohr kann gehen.* The downward revision of the 1937 crop affects only the necessary discount from the official crop made here. The determination of the 1937 barn crop by the writer is entirely independent from the official estimate.

This indicates that the writer has not underestimated the amounts of grain utilized for each specific purpose.

The crops of 1937–39 obtained by the reconstruction method imply the necessity of discounting official estimates by fully 20 percent. A check in Appendix Note I indicates a close agreement between the revised yields of grain and the official barn yields of the other important crops.

The round figure of 8.5 quintals per hectare is accepted here as the prewar yield of grain as against 8.0 quintals for the pre-collectivization period. Since the area was slightly below 100 million hectares, an output of 83–84 million tons is indicated. In estimating the output directly, the writer prefers the round figure of 85 million tons, which exceeds the pre-collectivization level by about 15 percent.

The results of the analysis indicate the need of roughly the same discount (about 20 percent) from the official estimates for the 1937–39 crops as for those of 1933–36. The fact that these discounts remain the same in spite of the fact that harvesting losses were unquestionably reduced, supports the conclusion that the 10 percent permissive discounts were abolished with the estimation of the 1937 crop.

Since a discount of fully 20 percent was needed to bring the official crop estimates of 1937–39 down to the barn-crop status, and since a reduction of harvesting losses to below that level is likely to have occurred, it is reasonable to believe that the determinations of the grain yields and crops continued to be overestimates even as determinations of the yields and crop on the root (see pp. 730–31).

Wartime.—Andreev, in his report of February 1947, stated that the grain yield is to increase 54 percent during the 4th Plan Period. Since the yield planned for 1950 is 12 quintals, the yield in 1945 may be taken as 7.8 quintals. The yield of 1946 is officially declared to have been substantially worse than that of 1945. Both yields are, of course, in on-the-root terms. Together with Andreev's information on the grain acreage, the yield stated for 1945 indicates an output of 66.7 million tons on the root. This compares with over 100 million tons (on the root) before the war in the old territory alone.

During the war and postwar years the critical food situation and especially the fact that delivery obligations to the state were fully maintained vis-à-vis a great decline in output greatly strengthened the tendency toward concealment, very pronounced from the start of the collectivization drive. The local government and Party officials either could not restrain it or participated in it themselves. The fundamental reorganization of the crop-estimating setup since the 1947 crop, which took the estimating out of the hands of local officials, leaves no doubt on this score (see pages 736–37). It is therefore quite possible that the needed discount from the official estimates of the 1945 and 1946 crops was smaller than the 20 percent, firmly established for the 1933–39 crops. Moreover, the 1946 grain crop may have been underestimated relative to that of 1945. With discounts of, say, 15 and 10 percent for the 1945 and 1946 crops respectively, the barn crops of those years work out to around 57 million tons each, as against little less than 100 million tons—the average prewar output of the present territory.

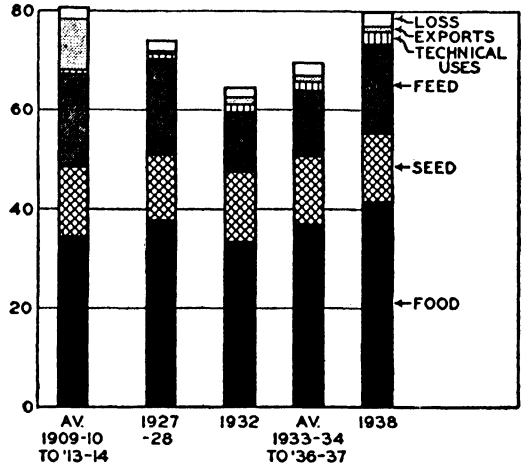
4th Plan.—The goal of the 4th Plan for 1950—12 quintals per hectare on the root—corresponds to perhaps 9.6 quintals barn yield, provided the needed discount from the on-the-root yield is not larger than it was before the war. It compares with less than 9 quintals in the present territory before the war. A yield of little more than 10 quintals on the root in 1950 (normal weather assumed) seems more likely. With this yield, the planned acreage would return a barn crop of little more than 85 million tons or perhaps 10 percent below the prewar level. But with the new crop-estimating setup operating, the goal may well be reached—statistically.

UTILIZATION

Utilization of grain has been analyzed in detail for 1927–28, 1932, the average of 1933–34 to 1936–37, and 1938 (Chart 32). Most of the details are in Appendix Note J.

[21] The relative underestimation of the 1945 and 1946 crops is confirmed by the official claims that the 1947 crop exceeded that of 1946 by 58 percent. A large part of this increase must have been purely statistical. It seems certain that, while the needed discount from the official estimates of the 1945 and 1946 grain crops was below the discount established for prewar years, the discount needed for the 1947 crop was higher than the latter.

CHART 32.—GRAIN UTILIZATION BY ITEMS IN SPECIFIED PERIODS AND YEARS*
(*Million tons*)



* Data in Chart Appendix.

1927–28.—Russia is typically a bread-eating country. Not only can the population afford little of animal products and fats, but even such cheap substitutes as potatoes and dry legumes play only a modest role in the diet. With a per-capita consumption of approximately 250 kilograms of grain (including dry legumes) in the year 1927–28, the USSR topped practically all the countries of the world. As much as 64.5 percent of the total utilization (ex-seed and ex-waste) was so used. The percentage rises to 80 if one excludes grain fed to draft animals, which like seed, is only a factor of production. The utilization of grain for productive livestock ranked next to food consumption, but amounted to less than 20 percent of the latter. Industrial uses (almost exclusively for alcohol) and exports were minor items.

Food, 1932.—Bread rationing was restored as early as the spring of 1929. Thereafter the food situation deteriorated rapidly until, in 1932–33, the country was plunged into one of the worst famines in its history. Since weather conditions were normal for the 1932 crop, the famine was correctly characterized as man-made.

Human consumption of grain in 1932 was officially put at 37.26 million tons.[22] In proper statistics the two decimal places

[22] *2d Plan*, I, 390.

would imply a reasonable degree of precision. For some years the writer accepted this figure as correct; indeed, its availability was the reason for including the calendar year 1932 in the analysis of total grain utilization (Appendix Note J). Ultimately, however, the official estimate had to be dropped.

The Soviet population was officially estimated at 165.7 million at the end of 1932,[23] from which a figure of 164.7 million for mid-1932 may reasonably be assumed. Divided by this population, the consumption of 37.26 million tons gives a per capita figure of 226 kilograms for the year. Even this is much too high for the calamitous conditions of 1932, yet the population could not have been so large as the official estimate indicates,[24] even if all the loss of life from starvation occurred in the latter half of 1932–33.

Lorimer's tentative estimates of the population at the beginning of 1932 and 1933 are 158.1 and 158.2 million respectively.[25] For this population the 37.26 million tons would have provided a per capita consumption of 235.6 kilograms as against roughly 250 accepted as the average for 1927–28 (see Appendix Note J, p. 751). However, since the extraction rates of flour were increased materially after 1927–28,[26] the 37.26 million tons of grain claimed to have been available for food in 1932 would have implied about the same per capita amount of grain products (flour, groats, and dry legumes) as was available in 1927–28.

Certain other developments in the years following 1927–28 affected the per capita consumption of grain and grain products. The increase in the proportion of urban dwellers tended to diminish the average per capita consumption of grain products, while the great curtailment in the supplies of other food (except potatoes and vegetables) had the opposite effect. But those were minor factors in the face of the extreme shortage of grain and grain products.

The year 1932–33 certainly was a disastrous one. The fact

[23] *2d Plan*, I, 427.

[24] The population on January 1, 1939 was only 170.5 million.

[25] Frank Lorimer, *The Population of the Soviet Union, History and Prospects*, League of Nations (Geneva, 1946), p. 135.

[26] Only 7.8 percent of the wheat and rye flour produced by government controlled mills in 1932 was extracted at a rate of 75 percent or less (*2d Plan*, I, 188).

that the price of bread in the free market had increased almost thirty times in a few years, in spite of the aim of the 1st Plan to lower prices, testifies to this. Unfortunately the subject of the disaster of 1932–33 was and still is taboo in the Soviet Union. Even the population statistics of those years were withheld or distorted to conceal the heavy loss of life. Foreign correspondents were strictly forbidden to visit hunger-stricken areas. In the absence of reasonably dependable surveys, one is forced to rely on testimony of later visitors and on inexact computations from very incomplete population data. It would appear on the basis of that evidence that in the years centered around 1932–33 at least 5.5 million people died in excess of normal mortality. A large part of the excess deaths occurred in the rural areas in the disastrous winter of 1932–33.[27]

The analogy with 1921–22, the starvation year closest to 1932–33, presses itself on the observer. A preliminary estimate of the Central Statistical Board put the decline of the population in the hunger-stricken areas at 5.2 million in 1921–22, but this figure included those who emigrated from these areas.[28] In using these data for whatever conclusions they permit, it is necessary to bear in mind that the situation in 1932–33 was particularly unfavorable for the preservation of life in the crop-failure areas. Under a system of private economy and free prices, a great rise in prices in the areas suffering from crop failure would have prevented removal of grain in the fall of 1932. Government procurements in the suffering areas, however, proceeded as if it

[27] W. H. Chamberlin (*Russia's Iron Age*, Boston, 1934, p. 88), who visited different places in the starvation area after the prohibition of such visits was lifted, wrote: "The number of people who lived in famine areas was in the neighborhood of sixty million; the excess of deaths over a normal mortality rate can scarcely have been less than three or four million."

According to Otto Schiller (*op. cit.*, pp. 78–79), who was Germany's agricultural attaché in Russia for many years and also visited several starvation areas, "The whole area south of the forest-steppe zone of European Russia, stretching to the autonomous republics, parts of Kazakhstan and Central Asia, was involved in the starvation." Schiller said, furthermore, "The figure of 5 to 10 million victim deaths mentioned by another writer is unlikely to be excessive."

Lorimer (*op. cit.*, p. 134) counted the Soviet population from the 1926 census forward to January 1, 1934, and from the 1939 census backward to the same date. The figure obtained by the forward count turned out to be 5,522,000 persons higher than the population obtained for the same date by the backward count. These 5.5 million disappeared, although Lorimer's figure obtained by the forward count implies a probably exaggerated decline in the birth rate from 45.0 per 1,000 in 1927 to 30.1 in 1934.

[28] V. G. Groman in *National Economy of Russia for 1921–22*, Yearbook of *Economic Life* (Moscow, 1923), p. xiii.

were a normal crop year, and most of the procured grain was actually shipped out. The previous liquidation of the well-to-do peasants added to the death toll. One well-known statistician drew attention to the fact that, although on very harsh terms, the well-to-do peasants functioned as a substitute for crop insurance of the poor peasants.[29]

Although the analogy with 1921–22 cannot lead to exact conclusions, a brief review of the dietary situation in that year may offer a rough suggestion of the probable grain consumption in 1932. Fortunately, in 1921–22 the Soviet government made, or at least did not prevent, extensive studies of the diet in the hunger-stricken areas.[30] According to the winter (February) surveys of the Central Statistical Board,[31] the average annual per capita consumption of all grain products by the rural population in the deficit and, normally, surplus zones of the RSFSR was as follows (in kilograms):

February survey	Deficit zone	Surplus zone: slightly affected by crop failures	Surplus zone: starving
1920	192	264	...
1921	193	216	142
1922	193	141	84
1923	237	279	...

Since the normal grain consumption in the deficit and surplus rural zones was equivalent to about 240 and 270 kilograms respectively,[32] the 1921–22 consumption was about 20 percent below normal in the deficit zone and about 40 percent in the surplus zone. The weighted average consumption of the whole population was probably slightly below 70 percent of normal in that year.

The total food situation paralleled that of grain. The total daily calorie intake per adult male of the rural population was estimated from surveys as follows:[33]

[29] N. S. Chetverikov, "Variability of Harvests as a Factor Affecting the Stability of Agriculture in Russia," *On the New Path* (Moscow, 1923), V, Part 1, p. 96.

[30] A. I. Lositskii, "Feeding the Rural Population in Areas with Crop Failure," *Agriculture on the Path to Recovery* (Moscow, 1925), pp. 853–910, and other publications by the same author.

[31] A. I. Lositskii in *National Economy USSR for 1922–23.* Yearbook of *Economic Life*, 3d issue (Moscow, 1924), p. 115.

[32] *Ibid.*, p. 105, and other sources.

[33] *Statistical Handbook USSR, 1928*, Central Statistical Board (Moscow, 1929), pp. 848–49.

Survey	Deficit zone	Entire surplus zone	Surplus zone affected by crop failures
1919–20 January–February	3,365	3,856	...
1920–21 November–December	3,330	3,598	2,886
February	3,229	3,320	2,428
1921–22 October	3,705	3,093	2,516
February	3,571	2,453	1,958
1922–23 October	3,949	3,844	...
February	3,797	3,757	...

The surveys of 1923–24 to 1927 rarely showed a calorie intake per rural adult male of less than 4,000. Hence in the fall of 1921 the rural population of the areas affected by crop failures (a minor crop failure had already occurred in 1920) consumed about 60 percent of the normal quantity of food; by February 1922 its intake went down to about half of normal. The food intake of the whole rural population was slightly over 80 percent of normal in February and October 1921 but fell to about 70 percent by February 1922. The above percentages would be changed little if the urban population were included.

The per capita consumption of grain in 1932 was perhaps 20 percent smaller than the official estimate.[34] To be on the safe side, the consumption of grain for food in 1932 is accepted at 10 percent below the official estimate, or 209 kilograms per capita.

Other uses and total utilization, 1932.—When supplies are short, livestock are sacrificed before men, although the peasants are very reluctant to part with their last cow and especially their last horse. Although the livestock herds had been considerably reduced before the summer of 1931, an additional 15 percent of the cattle, 33 percent of the sheep, 19 percent of the hogs, and one-fourth of the horses disappeared during the crop year 1931–32. Most of the emergency slaughter occurred before the beginning of 1932, thus releasing more grain for food use in 1932. Like the humans, the surviving livestock had to do with reduced rations. In Appendix Note J, the use of grain for feed in 1932 is estimated at 12 million as against 19 million tons in 1927–28; the supply of millfeed is assumed to have de-

[34] For the crop year 1932–33, per capita consumption may well have been 25 percent below the estimate for 1932.

clined about 3.5 million tons. Even the estimate of 12 million tons may be somewhat too high.

Out of its greatly enlarged procurements the government saw fit to export considerably more grain in 1932 than in 1927–28. It also used more grain in distilling. The total grain utilization of 1932, arrived at on the basis of the preceding considerations, was almost 10 million tons below that of 1927–28 (see Chart 32, p. 551, and pp. 759–60). As previously stated, however, the accepted reduction of 10 percent applied to the official estimate of food use is probably too small.

The fact was mentioned that the analysis of utilization leaves no doubt that official estimates for the 1931 and 1932 crops of 69.5 and 69.9 million tons were too high. The more one thinks of these estimates, the more one becomes certain of this fact, and the larger becomes the amount one is confident to accept as the minimum amount of overestimation.

Food, 1933–34 to 1936–37.—The climax of starvation was not reached until the spring of 1933. The livestock herd also was then at its smallest, and total grain utilization was at the lowest point.

With the harvest of 1933 a recovery in grain consumption began, but it was slow. Not only did prices in markets and government commercial stores remain at exorbitant levels, but the government also considerably increased the prices of rationed goods. Rye bread, which had sold at 8 kopeks per kilogram in 1928 and on ration cost 12.5 kopeks in 1932, was 50 kopeks on ration in 1934. The extraction rates continued to be high, and white bread was practically unobtainable even for those few who could pay the high prices.[35]

Bread rationing was abolished on January 1, 1935. But this action was accompanied by a large price increase in government regular stores. Grain products had to be sold uniformly at prices about half-way between the former prices of rationed food and those of unrationed food in private markets and government commercial stores (on these stores see pp. 387–88). The new prices were about ten times those of 1928 even for

[35] Data in *National Economic Plan for 1935*, Cosplan (2d ed., Moscow, 1935), pp. 548–49, indicate an average extraction in government-controlled mills of 91 percent in 1934 and a still slightly higher one in 1933.

coarse bread, which rose least. The consumption of better bread was discouraged by disproportionately large price margins. The prices of groats (buckwheat and millet), rice, farina, and macaroni also were established at much higher levels than those of coarse bread. The price of farina was five and a half, macaroni four and a half times that of coarse wheat bread. Buckwheat cost as much as macaroni and at least fifty times as much as in 1928.[86]

The 230 kilograms of grain assumed as the per capita annual consumption in 1933–34 through 1936–37 (see Appendix Note J) is likely to be an overestimate.

Other uses and total utilization, 1933–34 to 1936–37.—The utilization of grain for feed was very low in 1933–34 and 1934–35, and the slight improvement that followed was arrested by the poor 1936 crop. Hogs were increasing rapidly in those years, but horses, the principal consumers of feed grain, continued to decline slowly.

The computation in Appendix Note J (see also Chart 32, p. 551) arrives at 69.5 million tons as the average utilization of grain (other than for the increase in carryover) in 1933–34 to 1936–37, a level about half-way between those of 1927–28 and 1932. No official appraisal of changes in carryover from the summer of 1933 to the summer of 1937 is available. The carryover in government hands certainly increased considerably from the low point of mid-1933. However, since the 1936 crop was very poor and distributions to the kolkhozniki were below their minimum requirements, the peasants probably had little more grain in stock by the summer of 1937 than they had had at the end of the crop year 1932–33. The increase in total carryover, distributed over four years, raises the computed yearly utilization by possibly one million tons or only slightly more per year.

Food, 1938.—A new era seemed to have started in 1937. The grain crop of that year—even the barn crop—may have been an all-time record. The distribution of grain to the kolkhozniki increased two and a half times, from about 12.4 million tons in

[86] See prices in Appendix Note K. The note points out the unfair manner in which the monopoly rights of the state are used to support the state-owned bakeries. The peasants are those most injured by this policy.

1936 to about 30 million in 1937. The ever-growing inflation, accompanied by rising wages, somewhat reduced the restraining effect on bread consumption of the very high bread prices established on January 1, 1935. While supplies of other foodstuffs increased, all except potatoes, vegetables, sugar, and fruits remained considerably below the level of 1927–28. Thus the consumption of *grain products* may well have exceeded the 1927–28 level. But this was probably not true of *grain*, for extraction rates were reduced but little during the 2d Plan Period. The goal, which specifically emphasized substantial improvement in the quality of bread,[37] remained largely unfulfilled.[38]

The per capita food consumption of grain in 1938 is here assumed to have been 245 kilograms, almost the same as in 1927–28 (see pp. 750–51), but 15 kilograms less than the 2d Plan's goal for 1937. The accepted per capita consumption of grain implies a moderate increase in consumption in terms of grain products.[39]

Feed, 1938.—The utilization of grain for feed rose sharply as a result of the abundant harvest of 1937. Moreover, a development was in progress which tended to raise the feed consumption of grain. It had started before 1937 and was rapidly growing in importance.

The principal feature of the sovkhozy (state farms) is their very high overhead cost and consequent very high unit cost of production. Persons in authority became aware that unit costs of livestock products could be cut considerably by feeding concentrates and thus increasing the output per animal unit. Even if the unit cost remained high, a great improvement would be

[37] *2d Plan*, I, 188.

[38] The *3d Plan* (p. 62), which again stressed the need of improving the quality of the bread, stated that 60 percent of all flour, wheat or rye, was whole-grain in 1937.

[39] There was an additional increase in terms of bread. The Soviet Union can claim the achievement of having increased the water content of bread far beyond the proportions customary in other countries. Government regulations establish *minimum* rather than maximum yields of bread per unit of flour. According to a government order of 1939, the minimum yield of whole rye bread is 152 percent (batch) and 156 percent (tin bread). The corresponding yields of whole-wheat bread are 145 and 148 percent. See S. A. Ermilov and others, *Commercial Food Products* (Moscow, 1945), p. 124. V. I. Petrov, *Commercial Food Products* (Moscow, 1947), p. 66, mentions maximum rather than minimum water-content standards but his figures are correspondingly higher. For whole rye bread he gives a maximum water content of 49 percent, implying a yield of bread of 160 percent. For years there has been mention of premiums to workers for each additional percent of water retained in bread. On similar practices with reference to sausages, see chapter xxvii.

shown. With an overhead as large as that common among the sovkhozy, even an otherwise uneconomical utilization of concentrates was indicated. A sovkhoz may have had a cost of production of milk three times its real value; by the use of large quantities of concentrates it might cut this unit cost to perhaps double the normal value of milk.

The all-penetrating control of the kolkhoz economy by the state, premiums to kolkhoz chairmen (actually bribes) and the like, created the same tendency in kolkhoz fermy as in the sovkhozy—a tendency to utilize larger quantities of concentrates per cow, per sow, and especially per chicken than was common in the pre-collectivization peasant economy. The tendency was much milder, however, in the kolkhozy than in the sovkhozy. Thus, while the government could not make up its mind to supply white bread at a price in any way commensurate to the price of coarse bread, and little millfeed therefore was available, livestock were wastefully consuming ever-increasing quantities of whole kernels of grain.

These are the considerations which lead one to accept almost the same figure for the utilization of grain for feed in 1938 as in 1927–28 (18 million tons compared with 19 million), although the number of horses—the principal feed-grain consumers in Russia—was down to less than half, and the poor state in which animals were slaughtered for meat (pp. 639–42) does not indicate heavy feeding of concentrates. The above figure for the feed use of grain must, however, be accepted on the basis of existing statistical evidence on feed use in kolkhozy.[40]

Other items and total utilization, 1938.—All other items, except seed, required more grain in 1938 than in 1927–28, and total utilization (except for the change in carryover) in 1938 works out to almost exactly 80 million tons, or around 8 percent more than in 1927–28.

In the absence of adequate data, the computed utilization of grain is also assumed for succeeding peacetime years. It can be stated with considerable assurance that if there was a change it was in the direction of diminishing utilization.

[40] A certain amount of the grain reported by the kolkhozy as fed is stolen by the kolkhozniki. But most of this grain is probably still used for feed.

A year-to-year analysis of the changes in carryover stocks from the harvesting of the 1937 crop to the Union's entrance into the war indicates that the producers are likely to have been about as bare of stocks at the end of the period as they were at its beginning. Whatever they succeeded in saving from the 1937 crop[41] had to be used up in following years. The government managed to increase its stockpiles considerably. Crop and utilization data indicate an increase by over 10 million tons, but the apparent absence of large storage-space construction, and the lack of German claims or Soviet complaints that the Nazis grabbed such quantities of grain as could only have been found in stockpiles, make the conclusion uncertain.

1945 and 1946.—The official estimates of the 1945 and 1946 grain crops indicate an extremely precarious condition, even if the needed discounts from on-the-root crops are smaller than those firmly established for prewar years (see pp. 545–49). Workhorses have to be fed grain. The feeding of grain to productive livestock was not entirely stopped, owing to large regional and social variations in supplies. Siberia, for example, had a good crop in 1946 and its hog herd may even have been increased. Many a tractor driver, even in poor-harvest areas, is able to afford feed for a pig. To economize on seed, the acreage in millet may have had to be increased even more in 1947 and the seeding rates of all grains may have been cut below minimum requirements. If, for 1946–47, one assumes 11 million tons for seed, 10 million for feed, and 5 million tons for technical uses, exports, and waste, a total crop of 57 million tons (see above, p. 550) leaves only 31 million tons for human food, or roughly 165 kilograms per capita. This would be grossly inadequate under Russian conditions even if full equalization were possible. Nobody knows whether or not the government had reserves to fall back on, or whether, with the political situation as it was, the government would have been willing to

[41] While carryover data had been a forgotten type of statistics in the USSR for a considerable period, they suddenly came to life with the statement that in July 1938, before harvesting began (probably July 1), "the stocks in the hands of kolkhoz members were equivalent to 9.3 poods [152 kilograms] per capita" (*Socialist Agriculture USSR, 1938*, p. 96). That figure works out to a little less than 12 million tons. This is a very large amount, even when it is realized that the utilization of the new crop does not begin for some time after July 1. The source failed to say how the figure was reached. It is very probably much too high.

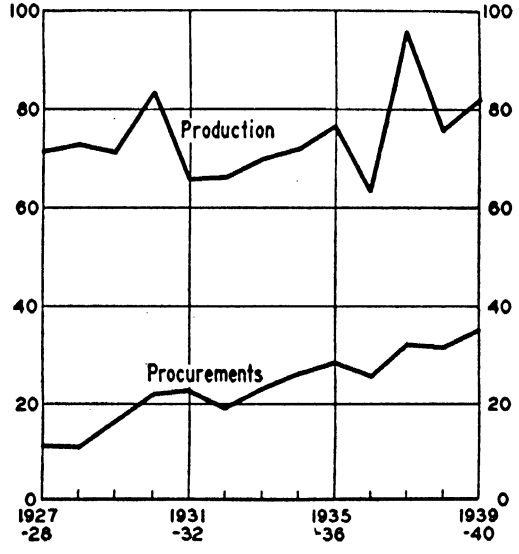
part with any of the reserves it may have had. The situation is not likely to have been relieved substantially from this source.

PROCUREMENTS

The great increases in government procurements of grain and other products during the 'thirties have been mentioned repeatedly. Since grain production first declined, and subsequently exceeded the pre-collectivization level only moderately, the greatly increased procurements made up a much greater proportion of the output than formerly. Chart 33 recapitulates

CHART 33.—PRODUCTION AND GOVERNMENT PROCUREMENTS OF GRAIN, 1927–28 TO 1939–40*

(Million tons)



* Data in Chart Appendix.

this pertinent development, which is untiringly proclaimed a big success in the Union. Its implication was, of course, that less remained for the producers to eat in the form of bread and animal products so far as these are produced from grain.

How many years will pass before the procurements in 1945–46 or 1946–47 are made known?

CHAPTER XXIII

TECHNICAL CROPS

The output of technical[1] crops, comprising fibers, oilseeds, sugar beets, tobacco, and rubber plants, almost doubled in the decade 1928–38. This result was, however, almost trifling as compared with the ambitious goals and was not uniform. Oilseeds, instead of expanding, declined greatly. Lack of uniformity can also be observed among the individual fibers. The Soviets can claim great success with cotton. A large increase in fiber-flax acreage was attained, but the failure even to approach the pre-1914 yields deprived this expansion of a large part of its significance. The results were completely negative in the case of coarse fibers. The output of sugar beets and tobacco was greatly enlarged. Plants raised for rubber were introduced, but their culture is still in its infancy and may never stand up against the competition of synthetic rubber.

During the 3d Plan Period, technical crops, instead of expanding further, merely held their own. The 4th Plan in essence is concerned with restoring the prewar status.

FIBERS

COTTON

Irrigated and unirrigated cotton are properly considered separately in the USSR.[2] After several trials in Czarist times, unirrigated cotton became a regular crop in the late 'twenties, and its rapid expansion was coincident with the collectivization drive. Though occupying a large acreage, unirrigated cotton was re-

[1] The literal translation of the Russian term. Since this group of crops includes some which, though they receive technical processing, are not used in industry, the Russian term is retained in preference to the more common "industrial" crops.

[2] The distinction is made between regions of irrigated and unirrigated cotton rather than between irrigated and unirrigated plantings, and the regions of unirrigated cotton are also referred to as the new cotton areas. A very small proportion of the cotton in North Caucasus, which belongs in the new and unirrigated areas, is actually grown under irrigation.

sponsible for only a small part of the total production, even in the best years. It was the high-yielding irrigated crop that made the USSR an exporter of cotton—though on a moderate scale and in disregard of the urgent needs of its own population for cotton goods. More important than the introduction of unirrigated cotton was the introduction of the long-staple Egyptian cotton in the prewar decade. In 1937 it accounted for about 8 percent of the cotton grown in irrigated areas.

Unirrigated cotton.—The new or unirrigated cotton regions comprise the southernmost portion of the Ukraine, the Crimea, and North Caucasus and an area immediately north of this. Cotton penetrates here farther north (to the 47th parallel) than anywhere else in the world—to the great pride of Soviet writers.[3] Moreover, the unirrigated cotton receives less moisture (down to or below 14 inches annual precipitation) than is available to cotton in any other major country.

Even though the planting goals for unirrigated cotton were not entirely fulfilled, a remarkable increase was attained—from 2,300 hectares in 1928 to 354,000 hectares in 1931 and 508,000 hectares in 1937 (Chart 34). The 3d Plan projected a further moderate expansion to 560,000 hectares in 1942.

Large yields cannot be expected in the new cotton regions with the small amount of moisture available for the crop. But the main obstacle is inadequacy of warmth. The seed will not germinate at temperatures below 60° Fahrenheit. If the temperature drops below this point after germination, the growth of the plant is virtually stopped. With the time needed for the harvesting of the crop included, even the earliest varieties known outside Russia need about 180 days with a temperature of 60° Fahrenheit or more to produce a fair crop. The season in the new cotton regions falls short of this by 20 percent or more. Yet the introduction of cotton occurred without the development of varieties which can do with less total warmth. Consequently, a substantial part of the cotton crop is frost-damaged every year, and in some years part of the plantings produce no crop at all. The average harvest is small. Furthermore, owing to

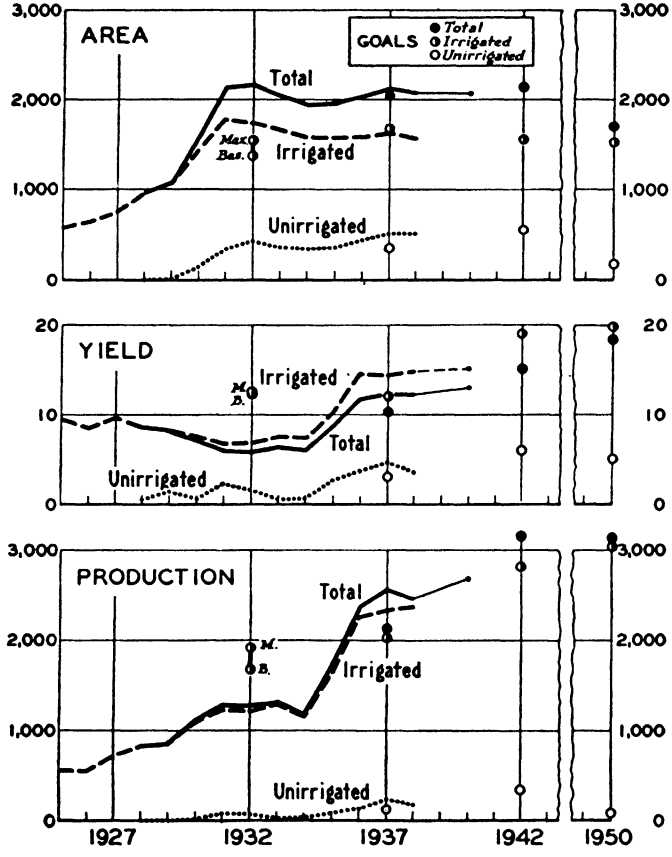
[3] G. Morozov, "The Reserves of Soviet Cotton Growing," *Socialist Agriculture*, November 1939, p. 51.

the climatic conditions, only the less valuable short-staple cotton can be grown in the new cotton regions.

On the average in 1928–34 exactly one quintal of unginned cotton was obtained per hectare. This is equivalent to about 28

CHART 34.—COTTON: AREA, YIELD, AND OUTPUT, 1925–38 AND GOALS OF THE FOUR PLANS*

(Thousand hectares; quintals per hectare; thousand tons)



* Data in Chart Appendix. Yield and production for 1940, and goals for 1950 are in on-the-root terms; 1950 goals for the enlarged territory.

pounds of lint per acre. The practical failure of the crop in those years can be attributed largely to unfamiliarity of growers with the techniques of cotton cultivation, and to prevailing general disorganization. It demonstrated the folly of introducing a new and doubtful crop in such a turbulent time and wasting badly needed draft power and labor on it. The yield of unirri-

gated cotton improved substantially in succeeding years, but the improvement was large only as compared with the crop failures of the earlier years. In five prewar years, the average yield was 3.5 quintals of unginned cotton, or about 100 pounds of short-staple, partly frost-damaged lint per acre.[4]

These results appear even more unfavorable in the light of the large amount of labor expended in achieving them. According to the United States Department of Agriculture,[5] Oklahoma farms devote 58 hours' labor per acre to cotton, or one hour per 2.3 pounds of lint. An official survey of collective farms in the USSR in 1937 disclosed an average of 81.76 days per sown hectare of unirrigated cotton—about 34 *days* per acre. This covered only the direct labor involved. It did not include the work of chairmen, bookkeepers, storekeepers, and guards connected with the management of the collectives, or time spent in the care of workstock, or the labor of MTS. The investigated farms averaged 586 kilograms of unginned cotton per harvested hectare.[6] With an allowance for indirect labor, about 4 pounds of lint per labor day, or less than half a pound of lint per labor hour were produced. The average input of labor per pound of lint on all farms was considerably larger, because the normal yield of unirrigated cotton was 3.5 quintals (unginned) per hectare as against 5.86 quintals on the investigated farms in 1937.[7] In spite of the fact that much higher prices were paid for unirrigated cotton than for Central-Asiatic cotton, and that producers received other important subsidies, it is probable that little unirrigated cotton would have been grown had its cultivation by the kolkhozy not been compulsory.

The new cotton regions were almost entirely overrun by the Germans, and cotton growing was practically discontinued there. With the shortage of labor that is likely to prevail on Soviet farms for years, it will be impossible to continue fully the enor-

[4] *Socialist Agriculture*, Apr. 2, 1946. The lowest average yield observed in any state in the United States in the decade 1930–39 was 136 pounds of substantially better lint per acre in Oklahoma.

[5] M. R. Cooper and others, *Labor Requirements for Crops and Livestock* (U.S. Dept. Agr., 1943), p. 116.

[6] *Productivity and Utilization of Labor in the Kolkhozy in the 2d Five-Year Period*, Gosplan (Moscow, 1939), pp. 16, 131. The unusual statement in the source, that the yield was per unit of *harvested* area, clearly suggests that part of the planted acreage remained unharvested.

[7] See pp. 429–30.

mous expenditure of labor that cotton requires under the extremely adverse conditions in the regions concerned. The 4th Plan set the goal for unirrigated cotton at 183,000 hectares, approximately one-third of the goal of the 3d Plan.[8]

Irrigated cotton: 1st Plan Period.—The acreage in irrigated cotton increased from 754,000 and 969,000 hectares in 1927 and 1928 to 1,783,000 hectares in 1931 (Chart 34, p. 564). As with many other crops, however, such large plantings proved unprofitable, especially because of the scarcity of draft power and fertilizer, and the chaos of the initial years of the collectivization drive. Much of the cotton was grown year after year on the same land without fertilization, and little or none of it was cultivated properly. From an average of around 9 quintals per hectare in 1925–28, the yield fell to less than 7 quintals in 1931 and 1932; thus, more than half of the large increase in acreage was offset by the decline in yields.

Irrigated cotton: 2d Plan Period.—By the time the 2d Plan was prepared, Soviet authorities had begun to realize the necessity of growing cotton in rotation. It was decided to stabilize the acreage in irrigated cotton at the 1933 level of 1,677,000 hectares. Actually it declined to 1,570,000 hectares in 1937, but even this reduced area was more than 60 percent above that reached before collectivization.

The Uzbek Republic retained its leading role in cotton with 917,000 hectares in 1938; the total for the four republics of Central Asia was 1,245,000 hectares. Adjacent Kazakhstan had 110,000 hectares in that year. The second region of irrigated cotton, South Caucasus, had 214,000 hectares in cotton in 1938, of which 195,000 hectares were in Azerbaidzhan.

The 2d Plan called for 12 quintals of unginned cotton per hectare of irrigated cotton in 1937. This represented an increase of 66 percent over the yields of 1931 and 1932. Until 1934 the yields improved barely enough to offset the decline in acreage. The price improvements beginning with the 1935 crop (p. 382) —Stalin himself took part in the proceedings—brought about a doubling of yields in two years. The 2d Plan Period ended with

[8] Details in Naum Jasny, "Unirrigated Cotton in Southern Russia and the Danubian Countries," *Foreign Agriculture*, January 1947, XI, 1–14.

a yield of 14.3 quintals of irrigated cotton per hectare, nearly 20 percent above the goal and slightly more than 20 percent above the pre-1914 level.

With a yield of fiber equivalent to 32 percent of unginned cotton,[9] a yield of irrigated cotton of 14.5 quintals per hectare (the 1936–38 average) was equivalent to about 420 pounds of fiber per acre. With only a fraction of the labor used in the USSR, the areas of irrigated cotton in the United States—New Mexico, Arizona, and California—averaged 479 pounds in 1930–39, and considerably more than that in the latest prewar years.

The sharp rise in yields of irrigated cotton represented mainly the fuller exploitation of possibilities long present. Commercial cotton growing on a large scale had been a late development in Czarist Russia. Both acreage and yields were increasing before the Revolution, in spite of the fact that it was grown in regions populated by backward and, in many cases, semi-independent tribes. The short-staple cotton which had been grown in Central Asia previously, was replaced by good-quality American upland cotton—an improvement that Great Britain failed to effect in India over a much longer period. A great deal remained to be done, however, before all possibilities were exploited, specifically before yields corresponding to the natural conditions of those areas could be achieved.

As a result of the great expansion in acreages and the increased yields, irrigated-cotton production around 1938 was almost three times as large as in 1928, and almost double the output of 1931 or 1932. The goal of the 2d Plan for the production of all cotton was exceeded by 18 percent. In 1937, the USSR was able to show a net export of 42,700 tons—after having been a heavy importer in Czarist and pre-collectivization times. In subsequent peaceful years it stockpiled considerable quantities.

Irrigated cotton: 3d and 4th Plan Periods.—The 3d Plan specified an area in irrigated cotton of 1,532,000 hectares in 1942—3.2 percent less than the actual area of 1937 and 7.5 percent less than the goal of the 2d Plan. The decrease had to

[9] *Socialist Construction USSR, 1936*, Gosplan (Moscow, 1936), p. 193.

come even though irrigated land was expected to increase by 600,000 hectares. Expanded acreages in such crops as sugar beets, which competed with cotton for land, had little to do with the scheduled decline. The realization of the need for more grass in rotation was responsible. This was learned the hard way. Actually, only 1,485,000 hectares of cotton were planted in irrigated areas in 1940.[10]

A plan supplementing the 3d Plan called for an increase of 233,000 hectares between 1939 and 1945 in the cotton area in Central Asia and Kazakhstan, the main cotton regions.[11]

The 3d Plan set 19 quintals per hectare (equivalent to 557 pounds of fiber per acre) as the 1942 goal for the yield of irrigated cotton, as against 14.3 quintals harvested in 1937. Although the goal seemed attainable, the increase, if any, in 1938–40 is not likely to have exceeded 5 percent (see Appendix Note G, p. 733).

Shortage of draft power and labor during World War II brought about a decline in the irrigated-cotton acreage. It was impossible to operate all the irrigation facilities and to handle all the irrigable land. Diversion to grain, which, besides being a food crop, requires only a fraction of the labor, was an additional reason. Another, though minor, factor was the diversion to sugar beets in Uzbekistan of several ten thousands of hectares. In 1945 the irrigated cotton acreage was about 20 percent below prewar.[12]

Poor cultivation, accompanied by a large decline in alfalfa acreage and the virtual discontinuation of deliveries of commercial fertilizer during the war, led to a decline in the yield of irrigated cotton to less than 11 quintals of unginned cotton per hectare on the root in 1945.[13] Output of all cotton in that year was substantially less than half the prewar.

The 4th Plan seeks merely to restore the prewar acreage in

[10] *Soviet Cotton*, October 1940, p. 2.

[11] *Socialist Agriculture*, October 1940, p. 25.

[12] According to N. A. Skvortsov, Minister of Technical Crops, the total cotton acreage was 1,212,000 hectares. See *Socialist Agriculture*, May 1, 1946.

[13] A. A. Andreev, "On Measures to Raise Agriculture in the Postwar Period": Report to the Central Committee of the Party, February 1947. See *Socialist Agriculture*, Mar. 7, 1947. Andreev's data pertain to all cotton, but virtually no unirrigated cotton was grown in 1945. The same is true of Skvortsov's data in note 12.

irrigated cotton (the goal for 1950 is 1,517,000 hectares), postponing the expansion scheduled by the supplement to the 3d Plan.

The goal of the 4th Plan for the yield of irrigated cotton is 19.9 quintals per hectare. This is one quintal higher than the 3d-Plan goal, although the total provision for fertilizer deliveries is reduced from that of the 3d Plan (see chapter xx, p. 495). But the goal of the 4th Plan is expressed in on-the-root terms (see pages 731 ff.), and the barn yield expected in 1950 is certainly less than that of the 3d Plan for 1942 and not much above the prewar level.

FLAX

Fiber flax is grown all over central and northern Russia. Kalinin, Smolensk, and Pskov oblasti are its center.

Acreages.—The 1st Plan scheduled an increase of 30 percent in the fiber-flax acreage in its basic variant, and of 40 percent in its maximum. Actually, the acreage was almost doubled during the 1st Plan Period (see Table 42, p. 503). One may read on this score: "The sowings of fiber-flax in 1932 were more than double those of prewar. This alone attests the immense advantages of the Soviet system, those inexhaustible reserves which we have."[14] The area in fiber flax declined from 2,510,000 hectares in 1932 to 2,110,000 hectares in 1934, and an only slightly larger area, 2,180,000 hectares, was set as the goal of the 2d Plan. By that time the planners realized that, in spite of some mechanization of flax processing, the growing of flax and the processing of its straw does not fit well into large-scale farming. Even the planned small increase of the acreage from 1934 to 1937 did not materialize.

A renewed decline lowered the fiber-flax area from 2,126,000 hectares in 1937 to 1,882,000 hectares in 1938. The 3d Plan was satisfied to be guided by reality, and made the latter figure the goal for 1942.[15] In 1940 the fiber-flax area was slightly

[14] *Sovkhozy at the XVth Anniversary of the October Revolution*, ed. by Krilov, Commissariat of Agriculture USSR (Moscow, 1932), p. 131.

[15] It is quite commendable to accept the facts and the inevitable in general, but Groman and many others of various degrees of prominence who had participated in the drafting of the 1st Plan lost their positions, and most of them their freedom, for just such a display of realism.

below the 1942 goal—1,801,000 hectares[16] as against 1,850,000.

During World War II, the fiber-flax acreage declined by more than one-half. In 1946 it was still only 934,000 hectares[17] as compared with Anisimov's figure of 2,108,800 hectares in 1940.[18] The cuts in flax acreage were severe not only in the occupied territories but in other regions as well. There was a strong all-round shift from non-food to food crops in the whole Union during the war. Cuts in fiber acreages, moreover, meant great savings in labor.

The goal of the 4th Plan for fiber flax in 1950 is 2 million hectares, implying a decline by around 100,000 hectares from the 1940 level. But the shortage of farm labor in the next few years may prevent the realization of even this goal.

Yield and output.—The real weakness in the flax situation during the Plan Periods was not in acreage. After all, even the greatly reduced 1938 area of 1,881,900 hectares was 38 percent above that of 1928. The supply of farm labor was gradually tightening, and flax requires a great deal of labor. A flax acreage greater than that of 1938 could hardly be maintained.

The 1st Plan set the goal for flax yields at 3.0 quintals per hectare (basic variant) or 3.6 quintals (maximum variant); the latter was merely the pre-1914 yield. Actually the yield declined from about 2.5 quintals per hectare to an average of 2.2 quintals in 1931–33.[19] The 2d Plan fixed its goal at 3.7 quintals per hectare, just 0.1 quintal higher than the maximum variant of the 1st Plan, but the yield in 1937 was only 2.7 quintals. Flax production in that year amounted to 570,000 tons as against the goal of 800,000 tons.

The 3d Plan called for an increase in the yield of flax fiber from 2.7 to 4.6 quintals, or by not less than 63 percent. The yield was given at 2.9 quintals for 1938; the increase this represented did not quite offset the decline in acreage. No data are available on the yield of flax in 1939. In 1940 it was

[16] *Socialist Agriculture*, Dec. 3, 1946. N. Anisimov (*Agriculture in the New Stalin Five-Year Period*, Moscow, 1946, p. 46) gives it at 2,108,800 hectares, but this figure apparently applies to the enlarged territory.

[17] Party decision of February 1947.

[18] See note 16.

[19] Table 43 (p. 507) shows a yield of 2.3 quintals for 1927, but the average of 1925 to 1928 was about 2.5 quintals (see p. 510 n. 10). The moderate degree of the decline in 1927–32 is attributable to the relatively slow rate of collectivization in the main flax areas.

only 2.7 quintals, possibly on the root.[20] The failure even to approach the pre-1914 yield of 3.6 quintals led to corresponding failures to fulfill the programs for the production of linen goods and for flax exports.

At the beginning of the war, flax production in the 1938 territory was around 500,000 tons, about two-thirds above that of 1928 but only slightly higher than before World War I.

Some idea of the decline in the yield and output of flax during World War II can be formed from the fact that, whereas the government procured 274,000 tons in 1937, the procurement plan for 1946 was only 120,000 tons of fiber[21] in the enlarged territory, i.e. 1.3 quintals of fiber per hectare. Only .75 quintal of fiber was procured per hectare in 1945.[22]

The 4th Plan realistically reduced the goal for flax yields from the 4.6 quintals (barn estimate) of the 3d Plan to 4.0 quintals on the root, although the newly acquired territories had higher yields before the war than the old territories of the Soviet Union. But the realistic attitude was not carried far enough, unless the foreseen difference between barn and on-the-root yields is very large.

COARSE FIBERS

Hemp.—Hemp growing is located south of the main fiber-flax areas. Orel and Kursk oblasti are its center. The 1927 hemp area of 912,700 hectares was barely maintained during the 1st Plan Period, when the acreages in flax and other technical crops skyrocketed. Yet hemp participated in the succeeding decline in plantings, decreasing from 920,000 hectares in 1932 to 654,000 hectares in 1938 and 597,700 hectares in 1940.[23] Moreover, while practically all hemp was grown for the fiber in 1928, part of the 1938 and 1940 acreage was in hemp grown for seed only (see below).

Before collectivization, hemp was grown chiefly by the peasants in vegetable gardens which were well fertilized and culti-

[20] The figure is implied in data in Anisimov, *op. cit.*, p. 46. See pp. 731 ff. on the shift from barn yields to on-the-root yields for crops other than grain.

[21] Government order, "On Measures to Restore and Further Expand the Growing of Flax and Hemp," May 17, 1946.

[22] N. A. Skvortsov in *Socialist Agriculture*, May 1, 1946.

[23] The 1940 figure is from Anisimov, *op. cit.*, p. 48.

vated. The transfer to kolkhoz fields was detrimental to yields. While hemp averaged 5.0 quintals per hectare in 1925–28,[24] the average yield was only 3.4 quintals in 1931–33.[25] In 1937, the most favorable crop year of the collectivization era, the yield was 3.9 quintals.[26] The 3d Plan was satisfied to ask for a restoration of the pre-collectivization level of 5 quintals per hectare, but had little prospect of attaining it.

Marketings clearly reflect the disappointing results in hemp in prewar years (Table 3, pp. 78–79). In 1927–28, 80,000 tons of hemp fiber were marketed, according to one source; according to another, the total was 95,160 tons, of which the government procured 65,370 tons.[27] The 1st Plan expected marketings of 210,000 tons (basic variant) or 270,000 tons (maximum variant) in 1932–33, but only 40,000 tons were procured in the calendar year 1932. The procurement goal of the 2d Plan was 295,000 tons in 1937; only 48,800 tons were obtained.[28] The 3d Plan sought only to increase this last figure about two and a half times, setting a goal approximately half as high as the maximum variant of the 1st Plan and less than 40 percent of the 2d Plan goal.

The hemp area shrank to 275,500 hectares in 1945. Judging from the procurement plan for 1946 of only 15,100 tons of fiber hemp for 1946,[29] there was also a marked decline in yield during the war (to perhaps 2.0 quintals of fiber per hectare). The 4th Plan goal for 1950 is 608,000 hectares in the enlarged territory, implying restoration to the prewar level.[30] The 4th Plan takes over the goal of 5 quintals per hectare from the 3d Plan, but this time it is on the root.

Other coarse fibers.—The unfavorable results with hemp made it necessary to look for substitute coarse-fiber plants, but success was meager. The so-called southern hemp, mainly of Italian origin, is the most important of the new fibers and apparently the only one to stay. Even for the fiber, southern hemp is

[24] *Statistical Handbook USSR, 1928*, Central Statistical Board (Moscow, 1929), p. 212.
[25] *Agriculture USSR, 1935*, Commissariat of Agriculture USSR (Moscow, 1935), p. 440.
[26] *3d Plan*, p. 220.
[27] *1st Plan*, II, Part 1, p. 332; *Statistical Handbook USSR, 1928*, pp. 280–81 and 706–07.
[28] *2d Plan*, I, 528; *3d Plan*, p. 232.
[29] Government order, "On Measures to Restore and Expand the Growing of Flax and Hemp," May 17, 1946.
[30] Anisimov, *op. cit.*, p. 48.

grown farther south than the so-called central-Russian hemp, the standard type, and this may justify its inclusion with the new fibers. But it is shown statistically under total hemp, the figures for which were given above.

From practically nothing in 1930, the area in southern hemp reached 230,500 hectares in 1938 and 322,100 hectares in 1940; part of the acreage was grown for seed only. Southern hemp is supposed to be much superior to the central-Russian hemp in the yield of fiber.[31] If this is true, the decline in yield of the central-Russian hemp was even greater than the average figures cited above imply.

Kenaph (*Hibiscus cannabinus*), mainly from India and introduced before the period here analyzed, was already losing ground in the 'thirties. The acreage in that crop was 53,400 hectares in 1930 and 40,300 hectares in 1940. Kenaph proved a low-yielding crop. According to Tollochko,[32] the average yield of stalk is 1.5–2.5 tons per hectare, with a fiber content of 12 percent.

The acreage in kanatnik (*Abutilon avicennae*) also declined, from 10,900 hectares in 1932 to 4,000 hectares in 1940.[33]

The acreage in all new coarse fibers, excluding southern hemp, was only 145,000 hectares in 1937, and the 3d Plan called for 160,000 hectares in 1942.[34] This means that the fight with Nature for new coarse fibers had been practically given up, except for the partial substitution of new hemp varieties for old.

The acreages in new coarse fibers, including southern hemp, declined during World War II to one-sixth of prewar. The goals of the 4th Plan are below the levels reached in 1940.[35]

OILSEEDS

ALL OILSEEDS

Soviet crop statistics are peculiar in their reporting of oilseeds. For the most part they ignore cottonseed, possibly because the peasants sell their cotton unginned. The acreage figures for fiber-flax and hemp are sometimes included with the

[31] M. M. Lapin, *Crops* (Moscow, 1947), p. 486.
[32] M. Tollochko, *New Developments in Processing Coarse Fibers* (Moscow, 1941), p. 15.
[33] *Ibid.*, p. 20.
[34] *3d Plan*, p. 219. [35] Implied in Anisimov, *op. cit.*, p. 48.

acreages in plants grown exclusively for seed, as in the *1st Plan*,[36] or excluded as in the *2d Plan*.[37]

The Gosplan reported 5.8 million hectares in oilseeds in 1927; 2.0 million hectares of this were in fiber flax and hemp. Of the 3.8 million hectares grown exclusively for seed, 2.8 million were in sunflower. Almost half of the balance consisted of seed flax. In addition, small quantities of castor beans, mustard, rape, soybeans, sesame, and several others were grown. The combined area in these unimportant crops totaled 297,000 hectares in 1928 (see Table 47 for details).

TABLE 47.—ACREAGES IN PLANTS GROWN FOR OIL ONLY, IN SPECIFIED YEARS*

(Thousand hectares)

Crop	1928	1932	1937	1938
Sunflower seeds	3,905	5,306	3,250	3,144
Oil-flax	372	645	334	352
Mustard	83	318	334	344
Soybeans	48	300	173	194
Ryzhik	50	60	...[a]	...[a]
Rape	54	78	53	70
Sesame	19	76	45	61
Peanuts	...	5	14	23
Castor beans	42	220	238	229
All others	1	71	...[a]	...[a]
Total	4,574	7,079	4,441[b]	4,416[b]

* *Agriculture USSR, 1935*, p. 397, and *Cropped Plowland USSR, 1938*, p. 21, and *Cropped Plowland USSR (Dynamics for 1928, 1932–38 in Comparison with 1913)*, Moscow, 1939, various pages.

[a] Included under "other technical crops."

[b] Incomplete to the extent of roughly 5 percent.

The basic and maximum variants of the 1st Plan called for an increase in oilseeds from 5.8 million hectares in 1927 to 8.6 and 9.1 million hectares respectively in 1932. With the areas in fiber flax and hemp[38] subtracted, the planned increase in plants grown for seed only was from 3.8 million hectares in 1927 to 5.9 million in 1932.[39] The goal was exceeded by fully one million hectares (Table 47).

[36] *1st Plan*, II, Part 1, p. 324, and *Control Figures of the National Economy USSR for 1928–29*, Gosplan (Moscow, 1929), p. 474.

[37] *2d Plan*, I, 468.

[38] The planned figures for hemp were not given. They are assumed to have been 1,100,000 and 1,173,000 hectares for the basic and maximum variants respectively.

[39] Possibly excluding castor beans.

As in the case of several other technical crops, the acreage in oilseeds was already far below the 1932 level when the 2d Plan was prepared. The draft of the 2d Plan sought to enforce a strong reversal of this setback, fixing a goal for 1937 only 800,000 hectares below the 1932 area. The goal of the final version of the 2d Plan was an oilseed area 1,800,000 hectares below that of 1932. Actually a decline of 2.6 million hectares occurred during the period, bringing the oilseed area down to a level slightly above that of 1927, but below 1928, which was still a pre-collectivization year.

The discrepancy between plan and fulfillment in the 2d Plan Period certainly provided a lesson. But the planners were reluctant to acknowledge failure and did not state the goal for all oilseeds in the 3d Plan—only the expected sunflower acreage.

The yields of oilseeds grown solely for seed declined over the first two Five-Year Periods, and around 1938 the total production of these oilseeds was materially less than it had been around 1928. The output of all oilseeds (including those obtained in the production of cotton, fiber flax, and hemp) increased from about 3.9 million tons in 1928 to 5.1 million in 1937 and 4.7 million in 1938.[40] But the average fat content declined since the proportion of the low-yielding cottonseed increased greatly, and all plants grown for the fiber, furthermore, need large quantities of seed. The total supplies of vegetable oil out of domestic production of oilseeds increased only slightly from 1928 to 1938.[41]

While only small acreages in oilseeds grown for seed were specified for the 3d Plan Period, fantastically high yields and a corresponding increase in output (from 3,224,000 tons in 1937 to 4,800,000 tons in 1942) were projected.[42]

[40] *Statistical Handbook USSR, 1928*, p. 255, gave the 1928 output at 3.4 million tons; 0.5 million are added for cottonseed and castor beans. The figures for 1937 and 1938, which obviously included all oilseeds, were given by Stalin in his report to the XVIIIth Party Congress. Here quoted from S. V. Sholts, *Course of Agricultural Statistics* (Moscow, 1945), p. 59.

[41] On the assumption that all seed not used for planting is processed, and that, moreover, all of it is processed in commercial mills, the total output of oil, excluding castor oil, in both years works out to around one million tons. The actual output was substantially smaller, because part of the seed is used for food directly and the custom mills, which process the seed for the growers, for the most part obtain materially smaller yields of oil than the commercial mills.

[42] *3d Plan*, p. 89.

Although the decline in oilseeds grown for seed during World War II was considerable, it was probably smaller than in any crop other than potatoes and vegetables. The 4th Plan seeks to have the prewar level moderately exceeded.

SUNFLOWER SEED

Acreages.—Sunflower, Russia's principal plant grown for seed only, is a crop which is hard on the soil without being prolific. The 1st Plan projected a continuation of the upward trend in sunflower acreages of Czarist and especially pre-collectivization times. The trend did continue very strongly until 1932, when the acreage was 87 percent above that of 1927. But the sunflower area dropped from the 1932 peak of 5,306,000 hectares to 3,897,000 hectares in 1933 and 3,500,000 hectares in 1934. The 2d Plan scheduled its restoration to 4,000,000 hectares in 1937, but only 3,250,000 hectares in sunflower were counted in that year.

The 3d Plan set 3,150,000 hectares—practically the acreage of 1938—as the 1942 goal. Statements of official writers, however, imply an increase by 1940 of at least 250,000 hectares over the goal. According to one source, the sunflower acreage was 3,542,800 hectares in that year.[43] Bessarabia, the only new territory growing the sunflower, had an acreage of only about 150,000 hectares before the war.

The 1945 sunflower area was 2,890,000 hectares,[44] reflecting one of the smallest declines in acreage of any crop from prewar levels. The 4th Plan goal is 3,700,000 hectares in sunflower in 1950, an increase by about 5 percent over Anisimov's figure for 1940.

A shift of the sunflower to the east, to less favorable areas, occurred during the operation of the first two Plans. More profitable crops to some extent replaced the sunflower in Krasnodar, the oblast with the highest sunflower-seed yields. There was also a large decline in the Ukraine—from 1,269,100 hectares in 1928 to 668,000 hectares in 1938—where growing conditions are about medium for this crop (the sunflower is grown in the

[43] Anisimov, *op. cit.*, p. 48. S. F. Demidov's figure (*The Development of Agriculture in the Postwar Five-Year Period*, Moscow, 1946, p. 46) is close to this.

[44] Implied in Andreev's report, February 1947.

drier southern Ukraine). On the other hand, Kazakhstan with its low yields showed an increase in sunflower from 76,400 hectares in 1928 to 149,100 in 1938; in West Siberia the sunflower was grown on 66,000 hectares in 1928 and 120,000 hectares in 1938. The rather dry Chkalov oblast had 173,000 hectares in sunflower in 1938. The 3d Plan sought a continuation of this movement.

The decline in total sunflower acreage during the operation of the first two Plans was to an undefinable extent connected with the large deliveries demanded from the old sunflower regions (see pages 375–77). The relatively low charges for the services of the MTS could not offset this disadvantage.[45] The increase in the price paid for obligatory deliveries of sunflower seed from 15 to 20 rubles per quintal, ordered May 22, 1946, (page 377) is not likely to make the growing of the sunflower attractive to those areas.

Obligatory deliveries and the charges for the services of the MTS had a considerable part also in the eastward shift of the sunflower. To encourage this shift, the obligatory deliveries of sunflower seed in the eastern areas were set at a fraction of those in the principal sunflower regions. In this way the sunflower in those areas was greatly favored over grain in the matter of obligatory deliveries (page 376), while enjoying the advantage of the relatively low charges for the services of the MTS.

Yields.—The yields of sunflower seed in the two unfavorable years, 1936 and 1938, have never been released. In spite of this incompleteness, no doubt exists that the slump in yields in the early 'thirties was not fully made up in succeeding years. The year 1937 was exceptionally favorable climatically. Grain, largely grown under conditions similar to the sunflower, produced an unprecedented harvest. The yield of potatoes was also a record. Yet the 1937 sunflower-seed yield of 6.4 quintals per hectare hardly reached the 1925–28 average (6.5 quintals) and was 15 percent below the yield obtained before World War I. The failure of the sunflower-seed yield to regain the

[45] The charges were such that less had to be paid for a hectare of sunflower with an average yield than for a hectare of grain with an average yield (see pp. 289–91).

pre-collectivization level was to some extent brought about by the eastward shift.

The curtailment of the sunflower acreage from 1928 to 1938 by almost 20 percent, accompanied by a certain decline in yield, brought about a reduction in the output of sunflower seed by over 25 percent. This was the principal reason for the failure of the ambitious plans to provide adequate quantities of vegetable oil for food, to boost soap production, and to supply the needs of other industries for oil.

While the 3d Plan sought a further shift of the sunflower to less productive areas, it specified 9 quintals of sunflower seed per hectare against an actual yield of 6.4 quintals in the favorable year 1937 and a normal yield for that year of less than 6 quintals. A yield of 9 quintals of sunflower seed per hectare in the areas where it was expected to be grown in 1942 would make sense only if it represented the "biological" yield. This idea must, however, be dismissed because the Plan called for an increase in the government procurements of sunflower seed from 1,075,800 tons in 1937 to 1,650,000 tons in 1942, or to more than 5 quintals per hectare.

The on-the-root yield of sunflower seed in 1945 was 6.9 quintals per hectare.[46] If a 20 percent discount from this leads to the actual barn yield, the indicated 5.5 quintals was not poor under the circumstances, and the output of around 1,500,000 tons of seed represented a relatively good result. The 10 quintals of sunflower seed per hectare scheduled for 1950 in the 4th Plan are unattainable even as a biological yield, unless the difference between the two types of estimates is much larger than the 20 percent observed with reference to grain in the last few prewar years.

The output of sunflower seed expected by the 4th Plan is 3,700,000 tons on the root. A more realistic goal would be slightly more than 2,000,000 tons in the barn.

OTHER OILSEEDS GROWN FOR OIL

In view of the disappointing results with sunflower, great efforts were made to push the secondary plants grown for oil,

[46] Implied in Andreev's report, February 1947.

including some new ones, but the results were almost negligible. The 3d Plan still continued to emphasize the need for expanding them.[47] Their procurements were scheduled to increase from 237,000 tons in 1937 to 607,000 tons in 1942—a fantastic goal.

As we have noted, seed flax was the principal crop among the secondary plants grown for oil in 1928. Though yielding poorly, this crop needs little labor. It fitted well into the disorganized state of affairs in the first years of the collectivization drive. The acreage sown in 1932 exceeded that of 1928 by 73 percent, but it declined with the return of more normal conditions to somewhat less than the initial status (Table 47, p. 574). During the war the acreage in this crop was cut to about one-half.

A large expansion in mustard seed was attained during the 'thirties (Table 47). But the crop proved well-adapted only to a limited region—Stalingrad oblast and adjacent areas with very low precipitation. After some expansion elsewhere, the share of this region was still 79 percent of the total in 1940 as against 92 percent in 1928.[48]

Ryzhik (*Camelina sativa*), an oilseed of the mustard family, was vigorously pushed in the last prewar years and during the war (Table 47). A very early and drought-resistant crop, it proved useful as a catch crop when spring drought occurred. It is grown mainly in Siberia. The 1935 area was given as 82,000 hectares.[49] The Party resolution of February 1947 calls for 223,000 hectares in 1947, suggesting an area of perhaps 150,000 hectares in 1946 and a substantial increase over the prewar level.

The soybean would have proved very useful had it been even moderately well adapted to the natural conditions. Plans to have one million hectares in soybeans in 1931 or 1.5 million in 1932 have already been mentioned (page 504). Actually the soybean area was raised from 48,500 hectares in 1928 to 467,800 hectares in 1934, but amounted to only 193,800 hectares in 1938. In 1945, 186,900 hectares were in soybeans,[50] but this figure includes sowings in Bessarabia which had about

[47] *3d Plan*, p. 90.

[48] I. Konyukov, "The Regions of Oilseed Growing in the New Five-Year Period," *Socialist Agriculture*, March 1947, p. 25.

[49] *Socialist Agriculture*, Feb. 11, 1942.

[50] Anisimov, *op. cit.*, p. 49.

65,000 hectares before the war. Soybeans yielded 4.6 quintals per hectare in 1945. The 4th Plan calls for 306,000 hectares with a yield of 8.5 quintals in 1950—a moderate acreage but a high yield.

Almost half of the total 1938 soybean acreage was in the Far East, where the crop was old. Little came of the plan to grow it on a large scale in southern European Russia. There is some cultivation in Krasnodar oblast and in the northern part of Western Ukraine, adjacent to Bessarabia, where the soybean has recently been grown with some success by the Moldavians on German initiative.

Unless ryzhik is considered a new oilseed, the castor bean is the only new source of oil that is grown in relatively large quantities. Its area increased from 42,400 hectares in 1928 to 220,200 hectares in 1932, and remained at this level until 1938. Data on the yield of castor beans are insufficient to ascertain whether this crop is adapted to the areas where it is grown, or should be placed in the same category with unirrigated cotton in southern European Russia (pp. 563–65) or unirrigated sugar beets in the Altai oblast (Appendix Note L), sponsored for political reasons. The areas where the castor bean is grown coincide with the new areas of the soybean, but Krasnodar oblast is more important for it relatively than western Ukraine. Only 64,500 hectares were in castor beans in 1946.[51]

The Soviet Union at some future time may have some sesame of its own production for sweets and some peanuts for eating as such, but neither crop promises to become a source of oil.

SUGAR BEETS

Acreages.—Sugar beets in the early 'thirties followed the trend of several other technical crops in jumping from 666,000 and 770,000 hectares in 1927 and 1928 to 1,537,800 hectares in 1932 and thus greatly exceeding even the maximum goal of the 1st Plan, 1,087,000 hectares (Chart 35).

From the 1932 level, sugar beets dropped to 1,211,000 hectares in 1933 and to 1,183,000 in 1934. The aim of the 2d Plan to restore the sugar-beet area to 1,450,000 hectares failed,

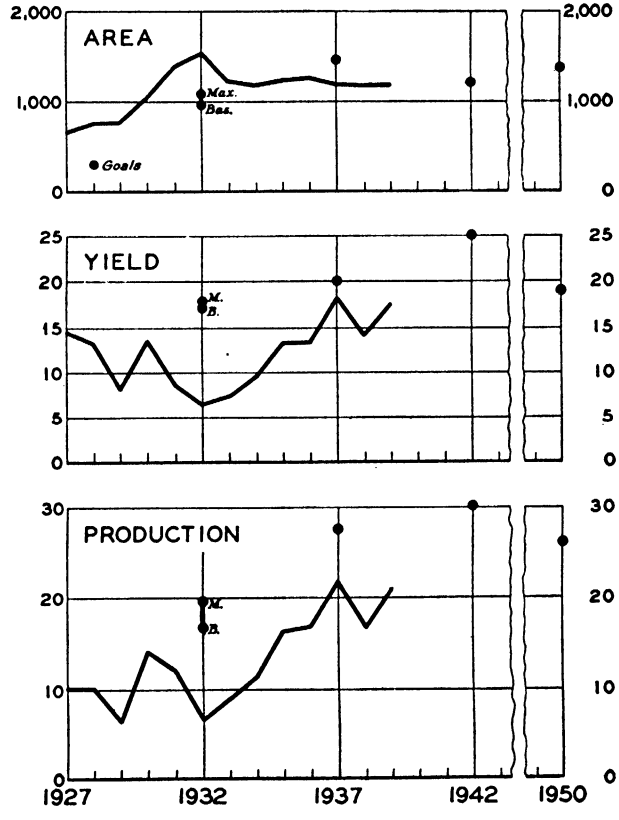
[51] Party resolution of February 1947.

and the 1937 total was only 1,193,000 hectares. The 3d Plan was satisfied to let this figure stand as its goal.

In 1945, sugar beets occupied 838,000 hectares in the enlarged territory,[52] representing a contraction of about one-third

CHART 35.—SUGAR BEETS: AREA, YIELD, AND OUTPUT, 1927–39 AND GOALS OF THE FOUR PLANS*

(Thousand hectares; tons per hectare; million tons)



* Data in Chart Appendix. Yield and production goals for 1950 are in on-the-root terms and for the enlarged territory. Dots represent goals.

from the 1939 level.[53] The 4th Plan goal of 1,368,000 hectares implies an expansion of roughly 10 percent beyond the prewar area, probably to make up for the low yields expected.

The eastward move.—A noteworthy feature in sugar-beet growing during the 'thirties was its expansion into eastern Euro-

[52] Implied in Andreev's report of February 1947.

[53] The total 1939 sugar-beet area was about 1,235,000 hectares, including approximately 48,000 hectares in territories subsequently added.

pean Russia and even into Asia. All plantings in and east of Kuibyshev and Saratov oblasti are referred to as the "new sugar-beet areas." The saving on transportation of sugar involved in this shift is a minor factor. Military considerations made it desirable to have at least a small part of the sugar production outside of the natural sugar-beet areas which are located close to the western USSR border. There were 73,100 hectares in sugar beets in the new areas in 1937, or 6.1 percent of the total, but the acreage was expanded further during the war.

Kazakhstan and Kirghiz, where sugar beets are grown under irrigation, had a total of 26,400 hectares in 1937. The areas are not warm enough to produce as satisfactory yields of cotton as are obtained farther south; cotton otherwise would have had the first claim on the irrigated land before the war. Temperature conditions, however, are favorable for sugar beets and good yields are obtained.[54]

Cultivation of sugar beets in other parts of the new areas was carried on under unfavorable to extremely unfavorable climatic conditions. The growing season, rather short even in the Soviet Union's natural sugar-beet areas, is definitely too brief for this crop in the new areas other than Kazakhstan and Kirghiz, and moisture is quite inadequate. Even the areas immediately west of the new areas, such as Tambov and even Voronezh, are poorly adapted to sugar beets.[55]

A large part of the unirrigated sugar-beet acreage of the new areas, 21,100 hectares, was in Altai krai in 1937. Growing conditions are extremely unsatisfactory there, and the yields are very low, out of any proportion to the labor input. Sugar-beet growing in Altai, which had started before Hitler came to power, is a striking example of misuse of the dictatorial power of the state.[56]

During the war sugar beets were extended into Uzbek, where growing conditions were favorable. About 40,000 hectares were

[54] See P. Sokolovskii and N. Burkov, "Sugar-Beet Growing in Kirghiz SSR," *Socialist Reconstruction of Agriculture*, May 1938, pp. 69–78.

[55] It is not clear why little attention is given to Krasnodar oblast, the southern portion of which is fairly well adapted to sugar beets. In 1938, Voronezh oblast had 90,600 hectares in sugar beets, Tambov 19,300 hectares, and Krasnodar oblast only 18,200 hectares.

[56] A short discussion of the growing of sugar beets in Altai krai may be found in Appendix Note L.

sown each year. As in Kirghiz and Kazakhstan, the growing of sugar beets there is merely a problem of taking irrigated land away from cotton.

Sugar-beet growing in the various regions as planned for 1950 compares as follows with 1940 (in thousand hectares):[57]

Region	1940	1950
South	824	838
Center	280	286
Volga	4	17
Ural	1	12
North Caucasus and Crimea	18	18
West Siberia	28	34
East Siberia	None	5
Far East	4	9
Central Asia and Kazakhstan	30	81
South Caucasus	7	10

The irrigated area in Kazakhstan and Central Asia is apparently scheduled to insure close to 25 percent of the crop.

Yields and production.—Sugar beets suffered more than any other major crop from the disorder of the collectivization drive and the accompanying inordinate expansion of acreages. In 1932 the yield per hectare was less than half the pre-collectivization average and only one-third of the maximum goal of the 1st Plan (Chart 35, p. 581). Of that year's total area, 518,000 hectares or exactly one-third remained unharvested.[58] The output of sugar beets in 1932 was only two-thirds of the pre-collectivization level and one-third of the goal for the maximum variant of the 1st Plan (Table 44, p. 513).

Gradually improving, the yield of sugar beets averaged 15.9 tons in 1936–39. This was 10 percent above the pre-collectivization level and 3 percent more than the yield before World War I, but it was 20 percent below the goal of the 2d Plan for 1937. It is true that the period 1936–39 included two bad years. The trend values were probably about 16 tons for 1937, 16.5 tons for 1938, and 17.0 tons for 1939. The figure thus computed for 1938 exceeds the pre-collectivization level by 14

[57] Demidov, *op. cit.*, p. 50.

[58] Computed from the figures on total production and the yield from the harvested acreages in *Agriculture USSR, 1935*, pp. 448–50.

percent.[59] The much heavier application of fertilizer in the late 'thirties sufficiently accounts for this increase.[60]

Thanks to a considerably larger acreage, accompanied by a moderate increase in yield, sugar-beet and sugar production nearly doubled during the decade 1928–38.

The trend value for 1939, the second year of the 3d Plan Period, was accepted above at 17 tons per hectare and the yearly increase at half a ton, though these figures are probably too high. At this rate the average yield of sugar beets in 1942 would have been 18.5 tons rather than the 25 tons projected by the 3d Plan. The latter figure would have been close to the yields obtained in 1933–37 in Austria and Czechoslovakia, where sugar-beet growing is highly efficient and climatic conditions are more favorable than in the USSR. Poland and Hungary, also more favored climatically, had average yields of 21.6 and 20.7 tons respectively in 1934–38. An average yield of 25 tons per hectare, unless on the root, is possibly too close to the precipitation ceiling of the Soviet sugar-beet areas, and could not be obtained even with the greatest applications of fertilizer.

The on-the-root yield of sugar beets in 1945 was only 10.6 tons[61]—one of the worst showings among the crops. The barn yield may have been less than half the prewar level. The Minister of Technical Crops said in 1946: "This year we have to procure 92.8 million quintals of sugar beets—more than twice the 1945 procurements."[62] The 1945 procurements were apparently at most equal to one-quarter of prewar.

The 4th Plan calls for a yield of 19 tons per hectare and an output of 26 million tons. But the goal for sugar production in 1950 is only 2.4 million tons,[63] as against 2,421,000 and 2,519,500 tons produced in 1937 and 1938 respectively in the old territory. About 18.5 million tons of beets are needed to

[59] The low yields in part of the so-called new areas were about offset by high yields under irrigation in Kazakhstan and Kirghiz.

[60] The estimates in the text were made before the yield of 17.1 tons on the root in 1940 was published (see Table 59, p. 733, and accompanying text). It was also assumed then that the 17.7 tons given as the yield of sugar beets in 1939 by the *International Yearbook of Agricultural Statistics, 1940–41*, p. 44, was an actual rather than an on-the-root yield. Somewhat lower figures than those in the text would probably be more nearly correct.

[61] Implied in Andreev's report of February 1947.

[62] N. A. Skvortsov in *Socialist Agriculture*, May 1, 1946.

[63] *Socialist Agriculture*, Apr. 25, 1946.

produce that much sugar. With the planned acreage, an actual yield of only 15 tons of beets per hectare would be needed for this, as against 19 tons on the root specified by the 4th Plan.[64]

The expectation that sugar-beet yields in 1950 will be below prewar is realistic. The desire to conceal this would be understandable. But the handling of such "statistics" is very confusing. The discount from the on-the-root to actual yield and output, indicated as necessary by the goals of the 4th Plan for sugar beets and sugar, is over 28 percent. This raises the puzzling question: what about all other yield and output figures given in the same Plan, for which a check by way of output of processed product is impossible?

TOBACCO

More than three-quarters of the Soviet tobacco output consists of makhorka (*Nicotiana rustica*), a low-grade variety used in other European countries only as an insecticide because of its high nicotine content. The usual tobacco (*N. tabacum*) is frequently referred to as yellow tobacco. Krasnodar oblast, Georgia, and Crimea are the centers of its production. Makhorka, which yields more than three times as much as regular tobacco, is grown farther north, Chernigov oblast in northern Ukraine being its center. The two varieties participated equally in the large acreage expansion in 1928–38, yellow tobacco increasing from 29,600 to 96,700 hectares, and makhorka from 32,900 to 104,500 hectares. The same yield, ten quintals per hectare, was reported for tobacco in 1940 as was normal before collectivization.[65]

A noteworthy feature of the 4th Plan is that sales of cigarette tobacco to consumers in 1950 must amount to only 40 percent of those in 1940, with a corresponding increase in sales of cigarettes.[66] This is the same policy that is followed with reference to all products: to compel the consumer to cover his needs with

[64] The writer searched carefully for an indication that some beets may be intended for feed; this would not be a bad idea, but he is confident that such use is not contemplated.

[65] On the yield in 1940 see V. P. Zotov, *Development of the Food Industry in the New Five-Year Period* (Moscow, 1947), pp. 56–57. The yields of 1925–28 are implied in the data of *Control Figures . . . . for 1929–30*, pp. 528–32. The yield averaged 9.5 quintals in 1925–28 according to *Statistical Handbook USSR, 1928*, pp. 216–17.

[66] Zotov, *op. cit.*, p. 43.

products in the final form of processing (see Appendix Note K on bread and page 642 on sausage).

RUBBER

In 1937, the Union started commercial growing of rubber plants, principally kok-sagyz of the dandelion family.[67] The rubber obtained from the roots of this plant is considered comparable in quality to natural rubber. The cultivation of kok-sagyz, however, is still in its infancy; Sacharov compares its present stage of development with that of the sugar beet more than a hundred years ago, when its sugar content was only a fraction of what it is now. The roots of the kok-sagyz weigh only one to two grams each; indeed, a root crop has yet to be developed. Even the several varieties of the plant have not been segregated; the seed now used represents a mixture of many varieties with differing contents and qualities of rubber.[68] The plant, very exacting in its soil requirements, is grown mainly in the Ukraine and White Russia. Three hundred to four hundred labor days a year are used per hectare.[69] While statistics on yields are not available, scattered data imply that some eight workdays are used per pound of rubber, worth about 20 cents in the United States.[70]

The 3d Plan stated: "To give the Soviet socialist industry natural rubber in considerable quantities as early as 1942 is an all-important task . . . ."[71] In 1940, 66,500 hectares were in rubber-bearing plants, of which 61,900 hectares were in kok-sagyz. The 4th Plan, the Party resolution of February 1947, and similar documents are silent about what happened to the acreages in rubber plants during World War II.

The notable improvements in the production of synthetic rubber in recent years have not thus far altered the Soviet attitude toward the creation of their own supply of natural rubber. The 4th Plan stresses this as well as the development of the synthetic rubber industry.

[67] L. Sacharov, "The Cultivation of Rubber Plants in the USSR," *Socialist Agriculture*, November-December 1940, p. 92. [68] *Ibid.*, p. 95. [69] *Ibid.*, p. 97.

[70] See F. Bragina and T. Tarasova, "Achievements of Advanced Rubber-Producers in Vladimar Oblast," *Socialist Agriculture*, July-August 1945, p. 58, and I. Polovenko, "Location of Rubber Plants and Specialization of Kolkhozy on Them," *Socialist Agriculture*, July 1947, pp. 49–53. [71] *3d Plan*, p. 77.

CHAPTER XXIV

POTATOES, VEGETABLES, AND FRUITS

POTATOES

In spite of the great increase in potato output in 1913–28,[1] there was a good prospect for further expansion. In 1928, the share of potatoes in cropped plowland ranged from 14.0 percent in White Russia to zero in Tadzhik, clearly reflecting the varying adaptability of natural conditions to this crop. The observed variations were, however, also the result of the fact that the potato penetrated into Russia from the northwest and had not yet concluded its conquests. Central Asia, Kazakhstan, and South Caucasus could easily have grown multiples of their respective 8,100, 55,200, and 32,100 hectares if the dietary advantages of the potato had been recognized. The potato was far from its natural saturation point also in many areas where it may have a certain future even as feed; in the Urals, for example, only 1.8 percent of the cropped plowland was in potatoes in 1928. The Union will have to rely more and more on all of northern and central Russia, its natural potato areas, for its supply of carbohydrates for food and feed—by way of expanded acreages and, even more, increased yields. The potato has a good chance to have a much more than proportionate share in this expansion.

While further increase of potato growing must be considered a sound development, the considerable expansion during the Plan Periods occurred not so much because the intrinsic merits of potatoes in the general development of Soviet agriculture

[1] The extent of the increase is not clear. According to *Socialist Construction USSR, 1936*, Gosplan (Moscow, 1936), p. 280, and other later sources, the potato acreage increased by 85 percent in 1913–28 and by 78 percent in 1913–27. But according to earlier data of the Gosplan which deserve the greatest attention (see *Control Figures of the National Economy USSR for 1928–29*, Gosplan, Moscow, 1929, p. 412), the 1927 output of potatoes exceeded that of 1913 by only 38.8 percent. The higher yield in 1913 than in 1927 could have accounted for only part of this difference. The acreage given by *Socialist Construction USSR, 1936* for 1913 may have been exclusive of the potatoes grown in home gardens.

were recognized as because the food-and-feed situation—especially in grain, the principal competitor of potatoes in both uses—was so unsatisfactory. In some areas potato growing may even have been overexpanded (in White Russia, for instance, 17.9 percent of the total cropped plowland was in potatoes in 1938). The growing of potatoes as material for industrial uses has made no serious progress. What happened was mainly a "flight" to potatoes by the kolkhozniki and other self-suppliers. This flight was possible because during the 'thirties potato growing remained the domain of individual producers to a greater extent than was true of any other crop. Collective members, individual peasants, and other individual producers among them had 3,788,000 hectares in potatoes in 1938, or exactly half of the total potato acreage. Growing of potatoes in the field as a rotation crop increased little or may not have increased at all.

Production.—The 1927 potato crop amounted to about 42 million tons. The production level around 1928 with normal weather conditions was around 45 million tons—some 5.7 million hectares with an average yield of 8 tons.

The 1st Plan specified a 42.1 percent increase in potato production in its basic variant, and 53.5 percent in its maximum variant (Table 42, p. 503). It made no separate mention of increases planned for acreages and yields, but the basic goal was possibly an increase of about 20 percent, and the maximum an increase of about 25 percent, in each.

According to official statistics, the area in potatoes was expanded during the 1st Plan Period from 5.5 million hectares in 1927 to 6.1 million in 1932—only about half as much as was probably planned by the basic variant. The officially reported yields of potatoes showed a small decline in the same period—from the 1928 level of about 8 tons per hectare to 7.3 and 7.1 tons in 1931 and 1932 respectively.[2] On this basis, since the increase in acreage almost offset the decline in yields, the output appeared to be practically maintained. However, the potato crops of the early 'thirties were probably overestimated slightly

[2] The voluminous *Agriculture USSR, 1935* (1,467 pages) avoided stating separately the yields of the socialized and private sectors. But a regional analysis shows that most of the declines in yields were in areas where the collectivization drive was earliest and most severe.

in official computations. In this study the 1932 crop is assumed to have been 40 million tons. However, whether the 1932 potato crop was 43 million tons (the official estimate) or 40 million, it was far below the goals of the basic and maximum variations of the 1st Plan, 60 million and 67 million tons respectively.

The goal of the 2d Plan for 1937 was a potato acreage 8.6 percent greater than that of 1932 (Table 42) and 17.3 percent above 1933. The actual increase from 1932 to 1937 was 12.3 percent. The ups and downs of the potato acreage reflect the prevailing chaos (Chart 25, p. 505). For some unnatural reason the acreage declined from 6,111,400 hectares in 1932 to 5,655,700 hectares in 1933. It rose again to 7,375,000 hectares in 1935 and 7,577,200 hectares in 1936, and finally declined to 6,865,100 hectares in 1937.

The reported yields of 1933–35 (8.7, 8.3, and 9.5 tons per hectare) seem to have been overestimates. This subject is discussed on pages 747–48. The average yield of potatoes in 1936 and 1937 was 8.2 tons per hectare. The weather in 1938 was even worse for potatoes than in 1936, and the yield averaged only 5.7 tons per hectare[3] as against 6.8 tons in 1936. The average of 1937 and 1938 was therefore smaller than that of 1936 and 1937, as was the average of 1938 and 1939. A yield of 8.5 tons per hectare, here assumed as the trend level reached by 1938, is higher than any of the above averages. Even this yield, however, is only about 6 percent above the pre-collectivization level. The goal of the 2d Plan for the yield of potatoes was missed by about 25 percent (Table 43, p. 507).[4]

The production goal of the 2d Plan for 1937 was 81.5 million tons of potatoes (Table 44, p. 513). Provided the official statistics are correct, the potato crop around 1938, with normal weather conditions, would have been about 60 million tons (7 million hectares with a yield of 8.5 tons). While only half of the planned rise materialized, there was an increase of

[3] This yield is implied in the total output as given in *Planned Economy*, July 1939, p. 155, and total acreage in *Cropped Plowland USSR, 1938*, Gosplan (Moscow, 1939), p. 11.

[4] The low level of potato yields in 1936–39 supports the assumption that the yields of the early 'thirties were overestimated (see above). This conclusion should be accepted in spite of the fact that weather conditions were more favorable for potatoes in the earlier period.

about 40 percent in potato production from the pre-collectivization (1928) level to 1938.

Previous experience encouraged drafters of the 3d Plan to specify a substantial increase of 1.1 million hectares in the potato area as the goal for 1942 (Table 42, p. 503). Almost half of the planned increase had occurred in 1938, i.e., before the Plan was approved. Potatoes were grown on 7.4 million hectares in that year. The small area of 6,354,700 hectares was reported for 1940[5] (1938 territory) as against the 1942 goal of 8 million hectares. It is not impossible, of course, that the 1940 acreage was revised downward in order to make the declines in war and postwar years appear smaller. A great decline in potato acreage in 1940 was, however, likely as the result of the taking away of land from the kolkhoz peasants in accordance with the order of May 27, 1939 (see p. 341).

Previous experience was ignored in planning a yield of 12.5 tons per hectare for 1942 (Table 43)—to give a total crop of about 100 million tons. In 1938 the yield was 5.7 tons per hectare; weather conditions, it is true, were exceptionally unfavorable, especially for potatoes. With reference to 1939, a below-average year climatically, it is only known that the potato yield was below 9 tons per hectare.[6] The yield of 10.9 tons per hectare reported by Vintaikin[7] for 1940 was obviously an on-the-root yield.

According to the Party resolution of February 1947, the 1946 potato area amounted to 7,671,000 hectares, implying a decline from the 1938 level equivalent to almost the total acreage of the added territories or about 20 percent.[8] This was, nevertheless, one of the smallest declines among the major crops. Expanded output of self-suppliers other than kolkhozniki and by state

[5] Z. Vintaikin, "Location of Potato Growing in the USSR," *Socialist Agriculture*, December 1947, p. 28.

[6] A yield of around 9 tons per hectare was indicated by Molotov's statement, in a speech to the Moscow Soviet on Nov. 6, 1939, that the 1939 potato crop exceeded that of the preceding year by 60 percent. However, the evidence of Vintaikin (note 5), in conjunction with information that the 1940 potato output was 35.6 percent higher than that of 1939 (leader in *Socialist Agriculture*, January-February 1945, p. 4) and with the official data on the 1938 potato crop, indicates that Molotov's statement was an exaggeration.

[7] Vintaikin, *op. cit.*, p. 29.

[8] The use of the small 1940 acreage, reported by Vintaikin, as the base of comparison permits Soviet officials to emphasize that the potato acreage has declined little since before the war.

organizations producing for their workers prevented a greater decline.

The 4th Plan did not give the acreage goal for potatoes separate from that of vegetables (see Table 45, p. 524), but its figure for the total suggests that, except for the adjustment for expansion of Soviet territory, no substantial change from the 3d Plan goal was contemplated for potatoes. The yield goal also was not stated, but it is reasonable to assume that the new plan was not quite as ambitious as the 3d Plan in this respect.

Consumption.—Per capita food consumption of potatoes was officially estimated as follows (in kilograms per year):[9]

Year	Rural	Urban	Total
1924–25	128	93	122
1925–26	132	83	123
1926–27	146	84	134
1927–28	142	71	130

These figures are averages for the whole country. Consumption is large only in areas with a considerable output. Differences in habits also contribute to the regional variations in food use of potatoes, especially by the rural population.

The rural population of Central Asia consumed on the average exactly one kilogram of potatoes per person in 1927–28, the urban population 24 kilograms. The figures for South Caucasus, though still low, are considerably higher—21 kilograms for the rural population, 44 kilograms for the urban. At the other extreme, rural consumption in White Russia and the Western oblast amounted respectively to 271 and 278 kilograms per capita.

The differences in habits, not associated with climate or not fully justified by it, account for the fact that per capita potato consumption by the rural population of North Caucasus (including Dagestan) was little more than half that of the Lower Volga region, though conditions for potato cultivation are scarcely less favorable. As another example, the urban population of White Russia is supposed to have consumed only 63

[9] *Economy of Fruits and Vegetables of the USSR*, compiled by P. Milyavskii, Gosplan (Moscow, 1931).

kilograms per capita in 1927–28 as against 111 kilograms for the urban population of the adjacent Western oblast, but the reliability of the data is questionable.

Total feed use of potatoes was estimated as follows:[10]

Year	Million tons	Percent of crop
1924–25	8.2	24.7
1925–26	10.4	26.9
1926–27	14.0	32.3
1927–28	12.3	29.8

The regional variations in feeding were naturally even greater than in crops and human consumption. The combined potato output of White Russia and the Ukraine, for example, was 31.8 percent of the total Soviet crop in 1927–28; their share in feeding potatoes, however, was 39.2 percent.

The goals of the 1st Plan for per capita consumption of potatoes compared as follows with actual consumption in 1927–28 (in kilograms per year):[11]

Population	1927–28	Goal for 1932–33
Urban	67.0	65.3
Rural	128.2	128.2

It will be noted that the estimates for 1927–28 are on a lower level than the later estimates quoted above. Yet the Gosplan expected no change in the potato consumption of the rural population. For the urban, it even foresaw a decline, obviously in view of the expected great increase in consumption of more desired foods.[12]

The critical food shortage of the early 'thirties operated to increase the food consumption of potatoes. Furthermore, so far as the consumers were able to produce food at all, potatoes were their easiest crop. This was true not only of the peasants, individual and collectivized, but of other consumers as well. The extensive village-to-town movement, it is true, had an opposite

[10] *Economy of Fruits and Vegetables* . . . . , p. 100.

[11] B. Grinberg and A. Kovner, "Food Problems in the Five-Year Plan," *Problems of Economics*, July 1928, pp. 48 and 54.

[12] This planning clearly reflected the attitude of the mass of the population toward potatoes as a food, used primarily or exclusively because of their cheapness.

effect on the food use of potatoes. After transportation costs and handling charges are added, potatoes lose a great deal of their cheapness relative to bread. In Russian areas adapted to potato growing, per capita consumption has always been much higher in rural districts than in cities. In the Central Industrial region, for example, which includes Moscow, per capita rural consumption in 1927–28 was 206 kilograms against 86 kilograms in urban districts. In the USSR as a whole, the rural population in that year consumed 142 kilograms and the urban only 71 kilograms, i.e., half as much, although the urban population was much denser in areas with a large production and consumption of potatoes. The adverse effect of the village-to-town movement on potato consumption was aggravated by the inadequate deliveries of potatoes to consuming areas.

The official estimate of 22,283,000 tons of potatoes consumed for food in 1932[13] implied a per capita consumption of 136 kilograms, if the population was as high as 165.7 million at the end of 1932, as stated in the 2d Plan. This per capita consumption would have been 4.5 percent above that given by Milyavskii for 1927–28. The increase would have been moderate (about 10 percent) even if the fact were taken into account that the urban population with its lower per capita consumption increased in the meantime more than the rural population.

The 1932 population was certainly overestimated in the 2d Plan (see p. 552). But the total food consumption of potatoes in that year may also have been overestimated, as was the consumption of grain, meat, and probably eggs (see pp. 551 ff. for grain; p. 96 for eggs). Thus the increase in per capita food consumption of potatoes from 1927–28 to 1932, indicated by the 2d Plan, may be about right.

The utilization of potatoes for technical purposes, provided from the marketed supplies, had to be curtailed during the 1st Plan Period owing to the tightness of those supplies. But these uses had been minor even in the beginning, less than a million tons of potatoes having been processed into alcohol and starch in 1927–28.

If the estimates of production and of utilization for food and

[13] *2d Plan*, I, 390.

alcohol are correct, a substantial but not drastic decline is indicated in the use of potatoes for feed. However, as was pointed out, the official potato crops of the early 'thirties may have been overestimated. The feed use of potatoes in 1932 is here estimated at 10 million tons, about a fourth less than in 1928.

The goal of the 2d Plan for per capita food consumption of potatoes in 1937 was 156.8 kilograms.[14] Although the fact that the population increased less than the planners expected made the goal more easily attainable, it is nevertheless very doubtful that it was reached.[15]

The utilization of potatoes for alcohol remained at a low level during the 2d Plan Period, only 16.0 percent of the alcohol having been made from potatoes in 1937.[16]

The statistics of production for the period around 1938 indicate that feed use of potatoes in 1937 not only was much higher than in 1932, but also considerably exceeded that of pre-collectivization years. The collective members, inadequately provided with feed grain, probably fed potatoes heavily. But comments on the feed use of potatoes in the 3d Plan suggest that this practice was not general—indeed, that in some areas, at least, the pre-collectivization level of feeding was not reached. The possibility cannot be dismissed, however, that the 3d Plan was not prepared and especially not worded carefully. The writer has not been able to form a clear picture of the distribution of the potato crop in the late 'thirties.

The 3d Plan aimed at ensuring a per capita food consumption of potatoes of 150 to 180 kilograms in 1942. This goal and its wording give reason for the doubt, expressed above, that the goal of the 2d Plan of 156.8 kilograms per capita was reached. The 3d Plan was modest in asking for an increase in potato alcohol from 16 percent of the total alcohol production in 1937 to 30 percent in 1942. In the Ukraine and White Russia, "up to 25 to 40 percent of the gross production is to be fed," according to the 3d Plan. But these levels of feeding had already

[14] *2d Plan*, I, 391.

[15] Leonard Hubbard, *Soviet Trade and Distribution* (London, 1938), p. 281, quotes an article in *Pravda*, Oct. 12, 1937, according to which per capita consumption of potatoes by the non-rural population increased only 7.2 percent from 1932 to 1936.

[16] *3d Plan*, p. 91. V. P. Zotov gave 15 percent for 1940 in *Development of the Food Industry in the New Five-Year Period* (Moscow, 1947), p. 55.

been reached in those important areas before collectivization. The utilization goals of the 3d Plan give the impression that the authors were by no means certain that their production goal of 100 million tons of potatoes in 1942 would be even approached.

A severe cut in the feeding of potatoes during the war may have permitted the per capita food consumption to be approximately maintained.

VEGETABLES

Two types of vegetables are distinguished in Russia. *Ovoshchi*, here for simplicity called Type 1, are grown mainly in home gardens; *bakhchevye*, Type 2, are grown principally in the field. But in statistics, watermelons, cantaloupes, pumpkins, and squash comprise Type 2, while Type 1 includes all others. Type 1 is grown everywhere, but preponderately in the south. Type 2 is typically a southern enterprise.

Statistics.—As in many countries, data on the production of vegetables in the USSR are extremely unreliable, and even the various official sources are in wide disagreement. The comprehensive publication *Agriculture USSR, 1935* gave no figures for vegetable production, possibly because none was believed even moderately accurate. The questionable nature of the various estimates presented here must therefore be kept in mind.

Following are estimates of vegetable production for the three years prior to the collectivization drive (in thousand tons):[17]

Year	Type 1	Type 2	Total
1925–26	12,570	8,620	21,190
1926–27	13,590	6,800	20,390
1927–28	13,970	7,370	21,340

[17] *Economy of Fruits and Vegetables* . . . . Although these estimates were prepared by a section of the Gosplan, the 1927–28 total differs greatly from the figure—15,100,000 tons—given in *1st Plan*, II, Part 1, p. 330. The data of the Central Statistical Board in *Statistical Handbook USSR, 1928*, pp. 280–81, are in closer agreement for that year: Type 1—14,597,980 tons; Type 2—6,987,110 tons; total—21,585,090 tons. The lack of conformity among official estimates is exemplified by the following data of the Central Statistical Board (*op. cit.*, p. 276) and the Gosplan (*Control Figures . . . . for 1928–29*, p. 476, and *Control Figures . . . . for 1929–30*, pp. 534–35) on total value of vegetable production in million 1926–27 rubles:

Agency	1925	1926	1927
Central Statistical Board	747	736	820
Gosplan (1929)	789	634	531
Gosplan (1930)	884	874	941

It is noteworthy that the production figures in Milyavskii's compilation, and probably of all preceding compilations, included feed roots with the vegetables of Type 1.[18] The output of these was as follows (in thousand tons) in the three pre-collectivization years:

1925–26	3,095
1926–27	3,459
1927–28	3,600

Substantial quantities of other vegetables of both types were also fed. For 1927–28 the following quantities in thousand tons were estimated to have been disposed of in this way:[19]

Cabbage	463
Food roots	1,257
Type 2 vegetables	2,926
Total	4,646

Some of these food vegetables were grown specifically for use as feed.

Thus, human consumption of vegetables was considerably smaller than gross production. Below are estimates of per capita annual food consumption of all vegetables, in kilograms, as computed in *Economy of Fruits and Vegetables* . . . . Allowance for waste was made by the source only for cabbage (about 13 percent of the crop).

Year	Rural	Urban	Total
1924–25	89.5	62.3	85.0
1925–26	96.0	64.1	90.3
1926–27	89.3	63.6	84.5
1927–28	86.2	66.4	82.6

Much justified complaint had been voiced in the USSR over the lack of variety in vegetables of Type 1. Cabbage and beets, the standard ingredients of the Russian soup, together with cucumbers and the indispensable onions made up almost the entire list. In 1927–28, consumption was as follows (in thousand tons):[20]

[18] *Economy of Fruits and Vegetables* . . . . , pp. 66–67. Feed roots have been shown separately in the statistics since 1928. See for example *Agriculture USSR, 1935*, p. 481.

[19] *Economy of Fruits and Vegetables* . . . .

[20] *Ibid.*, pp. 30–31.

Cabbage	3,246
Cucumbers	1,731
Food roots[a]	1,511
Onions (including garlic)	610
Tomatoes and others	852

[a] Almost exclusively beets.

Watermelons occupied 65 percent of the acreage of Type 2 vegetables in 1927, cantaloupes 19 percent, and pumpkin and squash 16 percent.[21]

1st Plan Period.—The 1st Plan was by no means modest in projecting, as its goal for vegetables, an increase in output of 43 percent in the basic variant, and 79.8 percent in the maximum variant (see Table 44, p. 513). However, even the maximum goal was soon dismissed as being much too low. The decision of the Economic Council of RSFSR, dated November 23, 1929, prescribed an increase in the acreage of vegetables (apparently only Type 1) of 75 percent in five years. The yield was to be raised 40–50 percent; in sovkhozy and kolkhozy by 75 percent. By an order of the central government of July 16, 1930, the average annual per capita consumption of all vegetables by urban workers was to reach 150 kilograms by the end of the 1st Plan Period. The corresponding level in 1925–26 to 1927–28 was 64 kilograms. The acreage in vegetables (again apparently only those of Type 1) was to be at least doubled by 1933. While the provisions of the quoted decision and order were unfulfillable, their mere existence sufficed to cause a great deal of confusion.

According to official statistics, the acreage in vegetables of Type 1 showed a tremendous expansion—from 797,000 hectares in 1928 to 2,235,600 in 1931 and to 2,319,200 in 1932. There may have been a tendency for the producers to increase the output of vegetables owing to the shortage of other food. Another such factor was that the non-socialized sector of producers retained a greater share in the growing of vegetables—35 percent of the total acreage in 1932—than of any other arable-land crop except potatoes. But most of the increase—real or statistical—in vegetable acreage was the result of the specific drive.

[21] *Ibid.*, pp. 66–67.

The 1930 acreage in vegetables of Type 1 was still relatively small, representing an increase of 349,000 hectares over 1928. By comparison the jump of 1,089,000 hectares in the next year nearly doubled the total area. The following quotation offers an insight into the manner in which the drive proceeded in 1930:

> The order of the government to expand the acreage in vegetables [of Type 1] by 20 percent [in one year] was overfulfilled, in spite of numerous formidable obstacles—late start with the drive; unpreparedness of the organization; acute shortage of seed; and heavy frosts in early July, which killed about 10 percent of the sowings.[22]

The acreage reported destroyed may never have been sown. The reporting of non-existing acreages and the abandonment of acreages sown poorly or only *pro forma* are even more likely to have occurred in the next few years, when the reported acreages in vegetables of Type 1 were almost twice those reported in 1930.

The acreage in vegetables of Type 2, those grown mainly in the field, declined from 1,208,700 hectares in 1928 to 903,200 hectares in 1931 and 868,400 hectares in 1932. The fields on which those vegetables were formerly grown had passed to the collective farms which neglected to use the land for that purpose. No specific pressure was exerted, and the chairmen of the kolkhozy had more important things to take care of than watermelons and cantaloupes.

The area in all vegetables is supposed to have increased from 2.0 million hectares in 1928 to 3.1 million in 1932.

It is much easier to enforce a large increase in acreage than in production, especially of vegetables, which require heavy inputs of labor. No output figures were published for 1932. According to the 2d Plan, 16,874,000 tons of all vegetables were available for food consumption in 1932.[23] There is no reason to assume that the Gosplan, in computing this figure, made any other discounts for waste than it applied in its consumption estimates for 1924–25 to 1927–28 (see p. 596). Consequently, the figure of the 2d Plan, if correct, indicates a 36 percent increase in the production of all vegetables for food from 1927 to 1932. The feeding of food vegetables certainly declined con-

[22] *Materials Concerning the Five-Year Plan of Development of Vegetable Growing in the USSR*, Fruit-Vegetables Institute of the People's Commissariat of Supplies (Moscow, 1931), p. 4.

[23] *2d Plan*, I, 390.

siderably, as did the feeding of grain and potatoes. If this decrease is estimated at 30 percent, the output of all food vegetables increased only about 20 percent from 1927 to 1932. This would imply a huge decline in yield—such a decline, indeed, as to make it certain that the acreage in vegetables shown for 1932 was never fully seeded.

The decline in yields during the 1st Plan Period should not be computed for all vegetables together. Vegetables of Type 1, the acreage of which was greatly expanded, yield much more than vegetables of Type 2, the acreage of which was curtailed. According to estimates of the Gosplan, the average yield of vegetables of Type 1 in 1926 to 1929 was 13.8 tons per hectare, and that of Type 2 only 5.6 tons.[24] An increase from 797,100 to 2,235,600 hectares of Type 1 vegetables, and a decline in the area of Type 2 vegetables from 1,208,700 to 868,400 hectares between 1928 and 1932, accompanied by a 20 percent increase in total output, would imply a decline of about 40 percent in the per hectare yield of each of the two types of vegetables. However, since the vegetables of Type 2 are grown by very extensive methods, no significant change could have occurred in their yields. Hence the yields of vegetables of Type 1 would have declined even more than 40 percent.

Furthermore, the yields of vegetables of Type 1 grown by the peasants, whether individual or collectivized, are not likely to have declined much; consequently, the acreages in vegetables of the kolkhozy and sovkhozy yielded almost nothing, if the data on sowings are correct. The same idea can also be put this way: the individual sector is shown statistically to have had 883,700 hectares in vegetables of Type 1 in 1932, as against a total area of 797,100 hectares in this type in 1928; it could thus have produced, by itself, practically all the Type 1 vegetables available in 1932.

The values placed in the 1st and 2d Plans on the production of vegetables easily escape attention but are well worth looking into. These values were not stated separately in the Plans, but were merged with the values of several other vegetable products, as in the *1st Plan*, or with the value of potatoes, as in the *2d*

[24] *Economy of Fruits and Vegetables . . . . .*, p. 32.

Plan.[25] The Gosplan estimated the 1927 production of potatoes and vegetables as follows (in million 1926–27 rubles):[26]

Potatoes	1,038
Vegetables	531
Total	1,569

It probably also used these estimates in the 1st Plan.

The value of the 1932 output of potatoes and vegetables was estimated in the 2d Plan at 2,293 million rubles (Table 51, page 662). According to statistics which may have been used in the preparation of the 2d Plan (see Table 44, p. 513), the 1932 potato crop exceeded that of 1927 by 13.3 percent. Its value may therefore have been entered at 1,176 million rubles in the computations of the 2d Plan. Hence the value attributed in the 2d Plan to the 1932 production of vegetables was 1,116 million 1926–27 rubles, implying a more than doubling of the 1927 or 1928 value of vegetables. Moreover, the value of the vegetables produced in 1927–28, as given by the Gosplan, included the value of the feed roots, while in the 2d Plan the feed roots were placed under the item "feed crops."

The values of vegetables computed in both *Control Figures . . . . for 1928–29* and in the *2d Plan* require revision. The value of the output of vegetables in 1927, here accepted also for 1928, may be computed as follows: 11 million tons of vegetables of Type 1 at 50 1926–27 rubles per ton—550 million rubles; 6.7 million tons of vegetables Type 2 at 27 rubles per ton—181 million rubles; total value—731 million rubles. In addition, 48 million rubles should be added to the value of feed crops in 1927–28 on account of feed roots (360,000 tons at 13.3 rubles per ton).

The output of food vegetables in 1932 is here estimated to have been 20 percent higher than in 1927 or 1928, amounting to 21.24 million tons, of which 18 million were vegetables of Type 1 and 3.24 million were vegetables of Type 2. At the stated prices, the total value of the vegetables produced in 1932 was 1,077 million 1926–27 rubles. The value of the feed roots

[25] *1st Plan*, II, Part 1, p. 326; *2d Plan*, I, 464–65.

[26] *Control Figures . . . . for 1928–29*, p. 476.

was included with that of other feeds. The figure for the value of vegetables in 1932 is a maximum figure, based on amounts of vegetables consumed in 1932 as given in the *2d Plan.* Several such data of the Plan turned out to be exaggerated.

2d Plan Period.—The 2d Plan aimed at increasing the quantity of vegetables available for human consumption from 16,874,000 tons in 1932 to 28,062,000 tons in 1937.[27] Thus it not only reaffirmed the order of July 16, 1930 (p. 597), but slightly raised the specified per capita consumption from 150 to 156.8 kilograms and, moreover, applied this norm to the total population rather than limiting it to workers in large cities.

The area in vegetables of Type 1 declined from 2,235,600 hectares in 1932 to 1,387,000 hectares in 1937. This shows the artificial nature of the preceding increase, and indeed supports the assumption that acreages in the early 'thirties were greatly overestimated. The acreage in vegetables of Type 2 continued to decline during the 2d Plan Period, but at a slower rate.

The area in all vegetables in 1938 was about the same as in 1928, with the important difference that vegetables of Type 1 remained considerably above, and those of Type 2 correspondingly below, their respective pre-collectivization levels.

Practically no commercial fertilizer was allotted to vegetables in 1938. The quantity of manure used on vegetables by the peasants may have been larger than before collectivization, but the kolkhoz and sovkhoz plantings probably received little. Consequently, there is no reason to assume that, with normal weather, yields of both types of vegetables were higher in the late 'thirties than before collectivization. Even these yields would have implied a larger recovery from the level of the early 'thirties than probably occurred.

Since the total acreage in 1938, though the same as in 1928, included a greater proportion of the heavier-yielding Type 1 vegetables, unchanged yields for each type imply an increase in total output of slightly less than 20 percent,[28] or about the

[27] *2d Plan*, I, 391.

[28] As elsewhere, the estimates of the yield and output in 1938 are made under the assumption of normal weather.

same output as in 1932. For 1937 a production of about 35 percent above that of 1928 will be assumed.[29]

The feed use of food vegetables was probably restored to the pre-collectivization level between 1932 and 1938. Since the population also increased, the assumption of the same production of vegetables in both years implies a reduction in per capita consumption of vegetables over the period. Indeed, almost all the moderate gain in per capita consumption that had occurred between 1928 and 1932 was lost by 1938. Only a negligible fraction of the tremendous planned increase in consumption provided for by the supplements to the 1st Plan and by the 2d Plan was realized. As will be shown in the next section, an acute shortage of vegetables prevailed in the cities at the end of the 2d Plan Period and in the beginning of the 3d Period. However, the statistics on the production of vegetables are too unreliable to indicate definitely whether or not per capita food consumption of vegetables was smaller in 1938 than in 1932. It may well have been smaller in 1932 or larger in 1938 than computed here.

The value officially placed on vegetables produced in 1937 was apparently about 1,300 million rubles.[30] This figure is 2.5 times as high as the estimate of the 1927 output of vegetables (including feed roots) probably implied in the computations of the 1st Plan, and 16 percent above the value of the output of vegetables in 1932 implied in the data of the 2d Plan. The value of the vegetables produced in 1937 is here accepted at about 11 percent above that of 1932; for 1938 (with weather taken as normal, as usual) a value equal to that of 1932 is assumed.

3d Plan Period.—The 3d Plan called for a moderate increase in acreage of all vegetables from 2.1 million hectares in 1937 (and 2.0 million in 1938) to 2.3 million in 1942. It was more reserved also in that it specified a per capita consumption of vegetables of 110 to 120 kilograms in 1942, as compared with the 150 kilograms asked by the government order of July 16,

[29] In addition to favorable weather in 1937, the acreage in vegetables was slightly larger than in 1928.

[30] *3d Plan*, p. 68. The figure for vegetables was included with that of potatoes for a total of 2,949 million 1926–27 rubles.

1930 for cities in 1933, and the 156.8 kilograms fixed as the goal of the 2d Plan for the whole population in 1937. The emphasis on a goal to provide 110 to 120 kilograms of vegetables in 1942 obviously implies that the actual supplies were considerably less when the Plan was in preparation. The per capita consumption of around 100 kilograms in 1937, assumed here, may be too high.

The Party decision of February 1947 gave the area in vegetables (presumably of Type 1, judging by the terminology) at 1,662,000 hectares in 1946. This is probably slightly more than the present territory had before the war. The 4th Plan was satisfied to emphasize expressly the need of a large increase in vegetables available for the urban population. But the Party decision of February 1947 called for increasing the total acreage (Type 1) to 2,000,000 hectares in 1948.

POTATOES AND VEGETABLES FOR LARGE CITIES

The great industrialization drive was inevitably associated with great increase in urbanization and a concentration of the demand for food. It is obvious that, under Russian conditions, cities and industrial centers cannot rely on the delivery of the cheap, bulky, and perishable potatoes and vegetables from distant areas. As early as the drafting of the 1st Plan, its creators recognized the need for establishing belts concentrating on potatoes and vegetables around large cities and in industrial regions.[31] The idea was stressed more energetically later, when the masses of urban consumers had become a reality. Little headway was made, however, toward satisfying this need. This is evidenced by the following quotation:

> The base enemies of the people had applied their dirty hands to the business and had worked towards destruction of the supplies of vegetables and hog keeping around such large centers as Moscow, Leningrad, Sverdlovsk, Gorki, Baku, and so on. During the 2d Plan Period acreages in vegetables declined in the suburban areas of those centers.[32]

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[31] *1st Plan*, Vol. II, Part 1, p. 294.

[32] S. F. Demidov in *Socialist Reconstruction of Agriculture*, December 1938, p. 33. A distressing picture of reduced acreages in vegetables and potatoes and of very low yields of these crops in 1935–38 in the industrially important Urals was presented in an article on "Trends of Agriculture in the Suburban and Mining Districts of the Urals," *Problems of Economics*, August 1940, p. 129.

Only in the exceptionally favorable year 1937 did Moscow obtain any considerable amount of vegetables from its own oblast —55.3 percent of its total receipts, as compared with 8.4 and 16.7 percent respectively in 1938 and 1939.[33] The city's receipts of potatoes from the Moscow oblast averaged 23.2 percent of the total in those three years.

In spite of the fact that the large cities were almost totally dependent on shipments of vegetables and potatoes from distant areas, the transportation of potatoes from one oblast to another, beginning with the 1939 crop, was forbidden by the order of March 19, 1939. This decree was neither enforced nor enforceable, but its very existence reveals the confused situation in those years, and further evidence from the considerable literature on the subject proves that no real remedy was in sight. Such progress as was made was more probably owing to the high prices in kolkhoz markets, than to planning.

More or less substantial headway in providing the urban population with locally produced potatoes and vegetables was made under pressure of the desperate war conditions. Factories established gardens on a large scale to insure at least a moderate efficiency of their workers. Some suburban kolkhozy expanded their output in response to exorbitant prices in the kolkhoz markets. Last but not least, the urban population itself went into gardening in spite of extremely unfavorable transportation conditions and the lack of fertilizer and implements.

FRUITS AND BERRIES

Such data as are available on fruit growing in the USSR can hardly be called statistics. A Gosplan publication gave the following estimates of the area in fruits in 1928 (in thousand hectares):[34]

Home gardens	658
Detached orchards	386
Vineyards	217
Total	1,261

[33] *Socialist Agriculture*, November-December 1940, p. 101.

[34] *Economy of Fruits and Vegetables* . . . . , pp. 36 and 62, quoting estimates of G. A. Kushchenko.

Another source estimated the average fruit production in 1925–28 at only 2.2 million tons,[35] while per capita consumption for the year 1927–28 was placed at 10 kilograms.[36]

The orchards, like other crops, must have suffered from the collectivization drive. Yet by the end of 1934 the area was reported as follows (in thousand hectares):[37]

Home orchards and vineyards.....	512
Separated orchards and vineyards.....	751
Total	1,263

Thus the total was the same as that estimated for 1928. The 3d Plan estimated 1,508,000 hectares in fruits and berries as of the end of 1937. Berries may also have been included in the estimates for 1928 and 1934. The estimate for 1928 indicated a large proportion of trees of non-bearing age. The estimates for 1934 and 1937 were silent on this point, but this proportion was certainly much larger in 1937 than 1928.

The 3d Plan scheduled an increase in the area in fruits and berries from 1,508,000 hectares in 1937 to 2,200,000 hectares in 1942. Much larger percentage increases than this were planned for the so-called tropical fruits such as citrus, and the planned expansion in tea plantations was particularly large.

An official stated in the spring of 1946: "A survey of fruit orchards of sovkhozy, kolkhozy, collective members, and other owners in the RSFSR disclosed that in recent years as the result of military operations and owing to insufficient care . . . . the acreage in fruit orchards was greatly reduced."[38] Orchards also suffered heavily during the hard winters of 1939–40 and 1941–42. Many trees perished before they reached bearing age. Also, wartime destruction probably covered up much of the unsuccessful planting done in previous years.

The 4th Plan concentrates on the restoration of destroyed orchards and vineyards, but also projects further expansion.

[35] V. Nosov, "Today's Problems of the Market of Fruit and Vegetables," *Economic Review*, January 1930, p. 143.

[36] *Economy of Fruits and Vegetables* . . . . , p. 10.

[37] *Agriculture USSR, 1935*, p. 228.

[38] I. Belokhonov, *Socialist Agriculture*, Apr. 23, 1946. The author was in charge of fruits and vegetables in the Ministry of Agriculture in RSFSR.

Citrus fruit and tea.—Great effort was put into the development of citrus-fruit and tea growing after the Revolution—with considerable results. In 1913, only a few hundred hectares were in tea plantations and the growing of citrus fruits, almost exclusively tangerines, was also on an insignificant scale. Most plantations of these crops are in western Georgia, but Azerbaidzhan also has some. Part of the needed land had to be provided by draining. Manure has been shipped over hundreds of miles to fertilize the naturally very poor land. The 4th Plan scheduled an acreage in tea of 62,000 hectares (57,500 hectares in Georgia, the rest in Azerbaidzhan) and of not quite 30,000 hectares in citrus fruit, new plantings consisting primarily of oranges with some lemons. The tea is of mediocre quality. The citrus output is still counted in units, three to four fruits being produced per person per year. Yet the results are advertized endlessly; citrus fruit plays the important role of Prince Charming of the Plans.

CHAPTER XXV

FEED

TOTAL FEED

As behooves a poor country, Russia utilized for feed only small amounts of products that were directly usable for food. Moreover, relatively little was produced specifically for feed, aside from the wild hay that was cut and the by-products of other crops that were saved, and of the small amount that was produced most was for horses. There was no change after the Revolution until a great expansion in the output of rotation hay occurred during the Plan Periods. However, the improvement of yields of other crops is believed the primary reason for growing this hay, the hay itself thus appearing merely a by-product.

While the feed situation and the changes in it are clear in broad outline, its statistical appraisal involves great difficulties. It is hardly possible to speak of statistics of output or consumption of roughage for pre-Revolution time. The picture became more favorable after the Revolution, but little could be accomplished before the rapid deterioration of all statistics started in the late 'twenties.

Comprehensive estimates of output and consumption of feed are available only for a few pre-collectivization years. The data for 1927–28 are reproduced in the following tabulation (in million tons):[1]

Feedstuff	Production	Used for feed	Percent used for feed
Roughage			
Straw and chaff...	121.4[a]	72.1	59.4
Hay	75.7	73.5	97.0
Feed roots	3.6	3.2	90.0

[a] The total residual of threshing, rather than the amount saved.

[1] V. P. Nifontov, *Animal Husbandry of the USSR in Figures*, Central Office of Economic Accounting (Moscow, 1932), p. 127. The utilization of feed by all livestock, including city animals, was apparently covered.

Feedstuff	Production	Used for feed	Percent used for feed
Concentrates			
Grain	72.3	23.8[b]	32.9
Potatoes	42.5	12.3	29.0
Oilcake	1.4	1.1	76.8

[b] Including millfeed.

All concentrates fed in 1927–28 amounted to about 26 million tons in grain equivalent. This was obviously a small quantity compared with the 150 million tons of roughage that was fed, not to mention the very substantial supplement of pasturage.

1st Plan Period.—The 1st Plan called for an increase in the feed use of grain, including millfeed, from about 24.5 million to about 33 million tons (basic variant) or 36.5 million tons (maximum variant).[2] The fulfillment of the plan for oilseed production would have nearly doubled the supplies of oilcake. The Plan was so optimistic over the prospects for concentrates available for feed that little attention was paid to roughage. The text of the 1st Plan mentioned only the large increase expected in the unimportant silage. From a book by Nikulikhin, it is known that in the maximum variant of the Plan the output of wild hay was expected to increase by 15 percent. The small output of rotation hay was to be almost doubled, while the gross output of straw was to increase by almost 30 percent.[3]

Feed production actually declined greatly during the 1st Plan Period, as did the utilization of concentrates, and this decline was one of the two principal causes of the great decimation of the livestock herds. Small herds implied only partial utilization of pastures.

2d Plan Period.—Optimism over the production of grain and oilseeds was again reflected in the feed provisions of the 2d Plan. This Plan anticipated a much greater rate of mechanization than did the 1st Plan; since horse numbers were greatly reduced, a much smaller grain requirement for horses—the principal consumers of concentrates in the USSR—was in prospect. Yet the goal of the 2d Plan for feed use of grain (including

[2] *1st Plan*, II, Part 1, p. 333.

[3] Y. Nikulikhin, *Industrialization of Soviet Agriculture* (Moscow, 1931), p. 361.

millfeed) was 32 to 35 million tons,[4] as against the 33 or 36.5 million tons set in the 1st Plan. Its goal for all concentrates was as high as 42.5 million tons.[5]

But unlike the 1st Plan, the 2d Plan was also optimistic over the future supplies of roughage. The area in perennial rotation grass was to increase from 3,800,000 hectares in 1932 to 6,900,000 hectares in 1937. Feed roots were scheduled to increase only from 726,000 hectares to 900,000 hectares in the same period, but their average yield was to rise from 10.69 to 24.0 tons.[6] Meadow and pasture lands were to be improved on an area covering 29,500,000 hectares; this was to raise the productivity of all meadows by 20 to 25 percent and that of pastures by 15 percent.[7]

All in all, great optimism prevailed. The unrealistic provisions of the 2d Plan concerning supplies of feed, especially concentrates, were tied in with similarly fantastic goals for the expansion of the output of pork and hog fat, and poultry meat (see page 638). One can hardly believe that even the mediocre economists responsible for the 2d Plan could have taken the goals seriously. It may be superfluous to add that little came of these overambitious provisions. The grain (excluding millfeed) fed in 1937 amounted to only around 20 million tons (see page 765) as against the goal of 32 to 35 million tons.

The plan for expanding the acreages in perennial grass was fulfilled after a year's lag; the goals for its yields failed by large margins. The following tabulation shows that little came of the scheduled improvements of meadows and pastures:[8]

	1935	1936	1937
Fundamental improvement			
1,000 hectares	400	648	210
Percent of goal....	78	78	17
Simple improvement			
1,000 hectares	2,120	1,725	936
Percent of goal....	25.5	22.0	14.0

The reason for failure was given as "damaging activities."[9]

[4] *2d Plan*, I, 242.

[5] It was not explained how this figure was derived. It probably included potatoes expressed in grain equivalent. [6] *Ibid.*, p. 241. [7] *Ibid.*, p. 242.

[8] A. I. Butorin, "Animal Husbandry on Pastures," *Problems of Animal Husbandry*, June 1938, p. 130. [9] *Ibid.*

Decline in feed supplies, 1928–1938.—One Soviet writer stated: "During the years of the 1st and 2d Plan Periods a considerable increase in the production of feed was attained."[10] This boast, repeatedly voiced by others,[11] has the characteristics of many other Soviet boasts. Taking into consideration the decline in livestock on feed, one is forced to conclude that the socialization of agriculture was accompanied by a large waste of feed, even if production remained unchanged from 1928 to 1938. This waste assumes huge proportions if the assertions of Libkind and many others were anything more than loose talk.

The changes in the supplies of feed from 1928 to 1938 were roughly as follows. Production of rotation hay increased by perhaps 16 million tons, but the decline in wild hay was most likely larger than that. The gross production of straw increased moderately, but less, at least relatively, was used for feed. The output of the more valuable chaff certainly declined. The acreage in feed roots was almost trebled from 1928 to 1938 and silage crops were introduced, but the actual quantities of both were small. The amount of grass available in pastures definitely declined, and the utilization of all pasture grass was limited both by ownership conditions and the regional distribution of livestock. The sovkhozy frequently did not have enough livestock to utilize all their pastures. After the livestock in such semiarid regions as Kazakhstan and Kirghiz had been nearly wiped out as a result of the collectivization drive (see page 633), vast stretches of collectivized pastures remained greatly understocked until the Union's entrance into the war.

As to concentrates, the amount of grain fed in 1938 was probably almost the same as in 1928 (Table 62, p. 751). There was less than half as much millfeed in 1938 as in 1928, while the supply of oilcake increased moderately. The quantity of potatoes fed is here estimated as having increased by 50 percent, but one cannot be certain of this.

The total utilization of feed around 1938 was probably slightly below the level of 1928. The value of roughage produced

[10] A. Libkind, "Intensification of Agriculture of USSR," *Socialist Agriculture*, March 1939, p. 46.

[11] See, however, the contrasting opinions of Alexeev (p. 614) and Bumber (p. 620).

or saved (hay, feed roots, silage crops, straw, chaff, etc.) is here estimated at 2.6 billion rubles (1926–27 prices) for 1928, 1.6 billion for 1932, 2.8 billion for the favorable year 1937, and 2.6 billion for 1938 (average weather assumed).[12] But this is, of course, quite arbitrary (see p. 670).

The fact that the total number of livestock on feed remained far below the pre-collectivization level was never brought up in Soviet literature in connection with the changes in feed supplies. When the number of livestock is expressed in units, computed by applying the official scale based on feed use,[13] the decline from 1928 to 1938 amounted to about 28 percent. The decline in available feed in this period could not have approached the extent of this decline in the livestock on feed. The discrepancy can be explained only by the fact that the new system was less economical in the use of feed than the peasant system had been. Small farmers everywhere display great ability to utilize every bit of feed. In poor countries, even such resources as the grass in ditches are not overlooked. The Soviet large-scale farms are even more wasteful of feed than similar farms elsewhere, since on the latter the losses are born by the owners.

Outside of the USSR mechanization of agriculture is normally accompanied by an increase in milk output. The decline in Soviet workstock in 1928–38 should have permitted an increase of more than 50 percent in milk production but even the 1928 level of output was never regained (Chart 38, p. 639).

3d and 4th Plans.—The disappointing results of the first two Plans with feed proved only partly edifying to the planners. The 3d Plan put up huge goals for the production of pork and hog fat and poultry, implying great expansion of the feed use of grain. But this may have been only window dressing. Probably, because the planners themselves were not certain of this point, much more emphasis was placed on roughage than was done in the 1st and 2d Plans.

A further great increase was scheduled for the area in sown grasses—from 12.7 million hectares in 1937 to over 20 million

[12] Equal values for 1938 and 1928 in the face of a smaller output or saving of roughage are brought about by the fact that the uniform 1926–27 price of rotation hay is high relative to its feed value.

[13] *Dictionary-Handbook on Social-Economic Statistics*, Gosplan (Moscow, 1944), p. 91.

in 1942. By this expansion it was hoped to kill two birds with one stone: to augment the feed supplies and to improve the yields of the crops grown in rotation with the grass.[14] An increase in total hay production of not less than 59 percent was anticipated from the expansion of rotation grass and by improvement of meadows. Improvements in the saving of the straw and chaff of combine-harvested grain were probably expected to boost their output much more than the 10 percent by which grain production was to rise. An expansion in the production of feed roots and silage crops was also planned.

The total output of produced roughage (in terms of hay) in 1940 was estimated at 105 million tons. This would be slightly more than the unrevised output of 1928[15] if (as one cannot be certain) the 1940 figure pertained to the pre-1939 territory and was not in on-the-root terms. A rather substantial expansion of the acreage in rotation grass is probably all that happened in 1938–40.

By the end of the war, the acreage in rotation hay was cut to half its prewar level, and output may have declined to one-third. The acreage in feed roots seems to have been maintained relatively better than rotation grass.

HAY

During the Plan Periods, wild hay was to a considerable extent replaced by rotation hay—with the ultimate balance of acreage unknown. After a considerable drop in the early 'thirties yields started to climb again, but did not regain the pre-collectivization level for rotation hay nor probably for wild hay. The share of the drier areas in rotation hay increased considerably and this was partly responsible for the fact that the yields of rotation hay remained far below the pre-collectivization level. Another reason, and the principal one in the case of wild hay, was that hay did not fit into the setup of socialized agriculture, especially the kolkhoz-MTS combination.

[14] See pp. 490–91 for discussion of excessive hoped-for results of rotation in areas of insufficient moisture.

[15] According to *Statistical Handbook USSR, 1928*, Central Statistical Board (Moscow, 1929), pp. 218–21, this amounted to 97 million tons of hay, plus the small output of root and silage crops.

The neglect of haying operations under the conditions of collectivized farming has already been discussed (pp. 468–69). The MTS were not interested in those operations. The 1940 haying plan for the MTS called for the mowing of only 5,322,000 hectares of wild and rotation hay, or 8.8 percent of the total hay acreage of the kolkhozy (see p. 469). Yet even this and similarly moderate goals for other years remained unfulfilled.[16] The kolkhozy, however, could not fully perform these operations with their own means, and their haying plans of 1938 and 1939 were completed only to the extent of 87.0 and 91.4 percent respectively. Even worse, the cutting of hay was regularly extended over a period several times longer than appropriate — with heavy losses in quantity and, especially, quality of the hay. The rather futile attempt to improve the situation by organizing 950 large machine-haying detachments in 1940 and 1941 was mentioned on page 469.

Haying operations were neglected even in the sovkhozy, though these were not handicapped by division of functions as in the case of the MTS and kolkhozy. After 1934 the kolkhozy, kolkhozniki, and even individual peasants were given permission to cut unused meadows of the sovkhozy.[17] As late as 1940 Sirotkin wrote of the sovkhozy: "The haying operation has been delayed and not infrequently finished in October [late June to early July is the haying season in most areas]. The quality of the hay deteriorates greatly."[18]

Wild hay.—The pre-collectivization statistics of acreage and output of wild hay were revised downward in the early 'thirties and this phenomenon is well worth looking into. The 1928 hay production was originally put at 97.0 million tons.[19] Without any explanation, this estimate was cut to 75.7 million tons.[20] The downward revision apparently pertained entirely to acreage rather than yields and specifically to acreage in wild hay. The production figures of the first source implied a wild-hay acreage

[16] M. Grishaev, "Organization of Machine-Mowing Detachments," *Socialist Agriculture*, April 1940, p. 84.

[17] Government order of May 29, 1934 in *Most Important Decisions on Agriculture* (2d ed.), p. 368.

[18] T. Sirotkin in *Socialist Agriculture*, April 1940, p. 57.

[19] *Statistical Handbook USSR, 1928*, pp. 218–21. [20] Nifontov, *op. cit.*, p. 127.

of 63.3 million hectares in 1928.[21] A later publication gave it at 50.4 million.[22] In 1938, the acreage in wild hay was estimated at the same figure of 51 million hectares in both 1938 and 1928. Since all meadowland was probably utilized in 1928, but part of it remained uncut in 1938,[23] the wild-hay land appears even to have increased from 1928 to 1938 according to official statistics.

The expansion of cropped plowland from 113 million hectares in 1928 to 134.4 million in 1932 was to a considerable extent at the expense of meadows. While no comprehensive data seem to be available on this shift, there is no doubt that a large area of meadows was turned into arable land. Alexeev, writing in 1938 on the feed supply of the kolkhozy, said:

> Damagingly planning . . . . the plow-up of highly-productive natural feed sources, the enemy of the people caused much harm in this respect and created a very difficult feed situation in a number of kolkhozy.[24]

Dolgopolov stated in 1935 that 21.5 percent of all investigated kolkhozy had no meadows, and 36.5 percent were without pastures.[25] It is quite possible that 10 million hectares or more of meadowland were converted into arable land in the decade 1928–38. Some sovkhozy, it is true, in later years were cutting hay on poor land that had previously been used only as pasture. On the whole, however, there must have been a considerable decline in the land used for wild-hay production. An analysis of the land resources as of 1934[26] also indicates that some 65 million hectares of unsown grass for cutting (the figure implied in the data of *Statistical Handbook USSR, 1928*) may well have been available before the expansion of the arable land during the 1st Plan Period.

[21] The same source (*Statistical Handbook USSR, 1928*, p. 84), in its statistics of land utilization, gave the area in meadows at only 36.1 million hectares, but it also listed only 63.9 million hectares of pasture land, while according to *Agriculture USSR, 1935*, Commissariat of Agriculture USSR (Moscow, 1935), p. 228, pastures occupied 344 million hectares.

[22] *Agriculture USSR, 1935*, p. 488.

[23] In 1928 the peasants had sufficient man power to cut all the available meadows and they needed all the hay they could get. In later years the plans for cutting wild hay were never fulfilled.

[24] M. Alexeev, in *Socialist Reconstruction of Agriculture*, September 1938, p. 72. See also Y. Bumber, "Agriculture of the USSR in the 3d Five-Year Plan," *Problems of Economics*, March 1939, p. 171.

[25] M. I. Dolgopolov, in *Socialist Reconstruction of Agriculture*, April 1935, pp. 37–39.

[26] *Agriculture USSR, 1935*, p. 228.

The following tabulation (in quintals per hectare) shows the large decline in yields of wild hay in the early 'thirties:

Year	All owners[a]	Kolkhoz-peasant sector[b]
1928	13.4	13.4
1929	11.3	11.4
1930	11.6	12.1
1931	9.9	10.3
1932	9.9	10.2
1933	10.6	10.6
1934	10.2	10.1
1935 (preliminary)	10.6	No data

[a] *Socialist Construction USSR, 1936*, Gosplan (Moscow, 1936), p. 341.

[b] *Agriculture USSR, 1935*, p. 488. Kolkhozy, kolkhozniki, and individual peasants.

There was very little improvement until 1935. All or practically all the decline was caused by delayed and negligent harvesting. The great deterioration in the quality of hay was of course not reflected in these figures.

No data on the yields of hay after 1935 seem to have been made available. This alone affords sufficient indication that no material improvement occurred. A decline of 25–30 percent (or roughly 20 million tons) in the production of wild hay between 1928 and 1938 seems a reasonable estimate. It specifically implies declines in harvested acreage and yield of 15 percent each.

Rotation hay.—Only around 2 million hectares were in rotation hay in 1913; by 1928 the area increased to 3.6 million.[27] The upswing in the 1st Plan Period brought the total to 8.2 million in 1932. The subsequent setback cut the total to 5.9 million. In 1937 the area was again equivalent to 8.1 million hectares. A real drive had to take place during the 3d Plan Period, the acreage in rotation grass having been expected to exceed 20 million hectares in 1942. A jump by 4.6 million had actually occurred in 1938, i.e., before the approval of the 3d Plan. There was no increase in 1939, but the upward movement was resumed in 1940 and 1941. The 4th Plan merely

[27] All references to area in rotation hay pertain to acreages cut in the year specified. The acreages sown to perennial grass are little more than half those cut annually.

restated the goals of the 3d Plan, the goal for the enlarged territory being set at 21.4 million.

About 70 percent of the 1928 sown-grass acreage was in perennial grass. As the result of the planless expansion during the 1st Period the acreage in the less desired annual grass considerably exceeded that in perennial in 1932 (4.5 million hectares as against 3.8 million). But in later years the emphasis was increasingly shifted to perennial grass. Little more than one-third was in annual grass in 1938. In the 3d and 4th Plans it was definitely relegated to a subordinate position of about one-fifth of the total.

Before the Plan Periods the small acreage in perennial grass was concentrated in the north and especially the west. Four oblasti, Western, Moscow, Leningrad, and Ivanovo, among them had 1.34 million hectares of the total of 2.4 million in 1928. The Ukraine had 392,800 hectares in annual, but only 140,400 hectares in perennial grass; North Caucasus (including Crimea) had only 71,800 hectares in perennial and 30,400 in annual grass. However, the areas with black and chestnut soils were the principal centers of the big drive. The enlarged Ukraine was expected to have 2.5 million hectares in 1950 in perennial grass alone, and North Caucausus (including Crimea) 1.3 million hectares—a more than forty-fold increase. The drive extended eastward more and more. While North Caucasus had 866,000 hectares in 1940 and the expansion scheduled in the 4th Plan would not quite double this area, the Central Black Soil region was scheduled to expand its acreage in perennial grass from 177,000 hectares in 1940 to 1,350,000 hectares in 1950. In Kazakhstan the increase was to be from 155,000 to 700,000 hectares.[28]

The drive toward expansion of rotation grass was first spurred by shortage of hay, although a simpler way would have been to harvest the wild hay carefully. Later on, the main emphasis was on the beneficial effect of the rotation grass, especially of perennial grasses, on soil fertility. It has already been pointed out

[28] Data for 1913 and 1934 from *Agriculture USSR, 1935*, pp. 481-86. Data for 1950 from S. F. Demidov, *Development of Agriculture in the Postwar Five-Year Period* (Moscow, 1946), p. 94.

(pp. 490–91) that, so far as concerns areas with inadequate precipitation, which were the centers of the big drive, the optimism of the officially sanctioned Williams school as to the beneficial effect of one to two years of perennial grass in rotation on soil fertility is not supported by experience in corresponding regions of the United States and Canada.

The considerable decline in the yields of rotation hay in the early 'thirties is clear from the following data (in quintals per hectare):[29]

1928	29.1	1932	18.5
1929	27.3	1933	21.2
1930	22.7	1934	17.9
1931	22.9	1935	19.4

These declines were greater than those observed in wild hay, although rotation hay probably was harvested more carefully and with better timing. The effect of the shift to the drier areas was an additional factor in the case of rotation hay. A decline of 20 to 25 percent in the yield of rotation hay from 1928 to around 1938 seems a conservative estimate. On this assumption the increase in the production of rotation hay over that period amounted to perhaps 16 million tons. Thus in terms of weight the decline in wild hay was not quite offset.

Of the 12.7 million hectares of rotation hay harvested in 1938, 4.2 million were clover and 2.2 million alfalfa. While rotation hay was thus considerably more valuable than wild hay, the double price of it in 1926–27[30] did not fit the conditions of 1938. There was relatively more rotation hay produced in 1938 than formerly. It was even more important that the high average price of rotation hay in 1926–27 was partly due to the fact that a large proportion of it was grown in areas with high feed prices. The share of those areas in rotation hay declined greatly from 1928 to 1938. Also to be considered is the great deterioration in the quality of all hay, resulting from the great delays in haying that were not eliminated before the war came. It is indeed certain that the average feeding value of all hay was materially poorer around 1938 than in 1928.

[29] *Socialist Construction USSR, 1936*, p. 341.

[30] *Control Figures of the National Economy USSR for 1929–30*, Gosplan (Moscow, 1930), p. 582.

STRAW AND CHAFF

The potential production of straw and chaff increased from 1928 to 1938 by about 15 percent, the assumed increase in grain production. But the waste of straw, and especially chaff, caused by the use of the combine and by the change-over to large farm units, certainly amounted to more than this. A further reason for the decline in the use of straw and chaff was the increase in the proportion of grain produced in areas where effective use of all produced roughage is impracticable. Many sovkhozy indeed display a great interest in the construction of paper factories and similar outlets for their great quantities of unused straw.[31]

FEED ROOTS AND SILAGE

The acreage in feed roots quadrupled between 1928 and 1938, but the yield had declined to half the former level by 1934,[32] the last year for which these yields were reported. According to the 2d Plan, the yield of feed roots was to increase by 124.7 percent by 1937.

Silage crops, which were not grown before 1930, occupied the relatively large area of 1,655,500 hectares in 1932, but dropped to 616,600 hectares the next year and remained at that reduced level. Corn and sunflower were the principal silage crops. Yields were so low that they hardly justified the effort (6.83 tons per hectare on the average in 1931–33 and 9.3 tons in 1934).[33] They apparently did not reach a reasonable size in succeeding years. In 1938, only 10.6 million tons of silage were stored,[34] and this consisted largely of weeds and refuse of other crops.[35] Sugar-beet tops, which made up a large part of the refuse,[36] produce excellent silage, however, if properly treated. The growing of silage crops was naturally almost discontinued in the war years.

[31] V. Chuistov, "Processing of Straw in Sovkhozy," *Socialist Agriculture*, November-December 1940, pp. 82–88.

[32] *Agriculture USSR, 1935*, p. 487.

[33] *Ibid.*

[34] *Socialist Agriculture USSR, 1938*, Gosplan (Moscow, 1939), p. 79.

[35] *Socialist Agriculture*, September 1945, p. 35, stated: "Silage in general consists of weeds and by-products."

[36] S. F. Demidov in *Socialist Agriculture*, February 1941, p. 26, gave the quantity of sugar-beet tops used for silage at no more than 3 to 3.5 million tons.

PASTURE

All plans for improving the pasture lands remained largely on paper. Meanwhile, the pasture area was dwindling. Substantial stretches, certainly of the best land, were being converted into arable land. Some pasture land was turned to haying. While improvements in handling the fallow (see pp. 485–86) were certainly desirable, they necessarily reduced the opportunity of using the fallow as temporary pasture. The same effect obviously resulted from the expanded disking of the stubble immediately after harvest and even from the increase in the proportion of land plowed in the fall.

In the early and middle 'thirties, because of insufficient livestock numbers, pastures in many areas were not fully utilized. This was merely one aspect of the immense waste and loss in that period. The situation changed with the rapid restoration of the livestock herds. But in the areas of very extensive animal husbandry, especially in seminomadic and nomadic regions, the herds were far below the pasture capacity as late as 1941 (see pp. 632–35).

CHAPTER XXVI

LIVESTOCK[1]

Animal husbandry suffered more than any other branch of agriculture from the collectivization drive. All through the 1st Plan Period and into the 2d, the mass slaughter of animals went on. Once decimated, livestock herds take years to rebuild. By the end of the 2d Plan Period the pre-collectivization level was restored only in hogs. The situation as a whole remained very unfavorable. Bumber wrote:

> The enemies of the people have imparted great damage to animal husbandry also during the 2d Plan Period by destruction of the feed basis, the squandering of feed, infection of livestock, disorganization of pedigree work, sabotage of the breeding of animals, and so on.[2]

As usual, "enemies of the people" signified the demonic personification of inability to achieve planned objectives, forcing what was unacceptable to the population, and so on.

A renewed decline in cattle and hogs, the principal types of productive livestock, occurred during the peaceful years of the 3d Plan Period.

IST PLAN PERIOD

Goals.—The goals of the 1st Plan with reference to livestock numbers (Chart 36) were tied in closely with the goals for feed production. Only the increase in hogs was expected to be large (44.5 and 53.9 percent, basic and maximum variants),

[1] Previously, livestock censuses were supposed to cover animals in rural economy. Since an unknown date all livestock except army horses have been included.

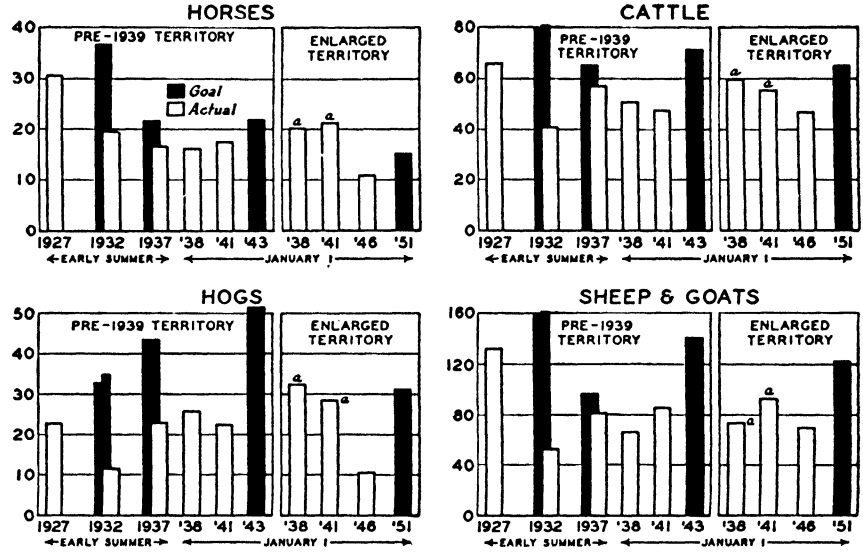
The analysis is complicated by the fact that the date of the livestock censuses was shifted during the period of observation. The 1916 census was taken in July and August. Subsequent counts established the livestock herds in June or May–June; they are frequently referred to as spring counts, but sometimes as summer counts. In the early 'thirties, the date of the principal livestock count was shifted to January 1. This is sometimes referred to as the winter count. In certain years data are available for both winter and spring. To avoid errors in the analysis, the count is used that requires the least amount of adjustment. In general, the spring figures are used prior to 1938 and the winter figures thereafter.

[2] Y. Bumber, "Agriculture of the USSR in the 3d Plan Period," *Problems of Economics*, March 1939, p. 171.

this probably in recognition of their rising trend and the anticipation of an abundance of grain for feed. The increase in other livestock was scheduled to amount to slightly more than 20 percent. The 1st Plan projected a steady rise in herds also for 1933. Hog numbers, for example, were to exceed the 1927 count as much as 70.8 percent in 1933, according to the maximum variant of the Plan.

CHART 36.—FIVE-YEAR PLANS: FARM LIVESTOCK*

(Million head: note different scales)



* Data in Chart Appendix. Summer counts through 1937; January 1 thereafter. The enlarged territory is that in postwar boundaries.

[a] Official data for pre-1939 territory, plus rough estimates for added territories.

Facts.—Instead of increasing, all kinds of domestic animals declined during the 1st Plan Period. In 1932 horses made relatively the best showing, with a little more than half of the scheduled numbers available. Hogs, sheep, and goats were at one-third of their goals, cattle at about one-half. Moreover, cattle in 1932 were reduced to little more than 60 percent of the pre-collectivization level, hogs to little more than half, and sheep and goats to only 40 percent.

Poultry dropped from 214.7 million in 1927 (spring count)[3]

[3] V. P. Nifontov, *Animal Husbandry of the USSR in Figures* (Moscow, 1932), p. 53. Only "poultry which survived the winter" was counted. Hence the count yielded an even smaller figure than a winter count would have done.

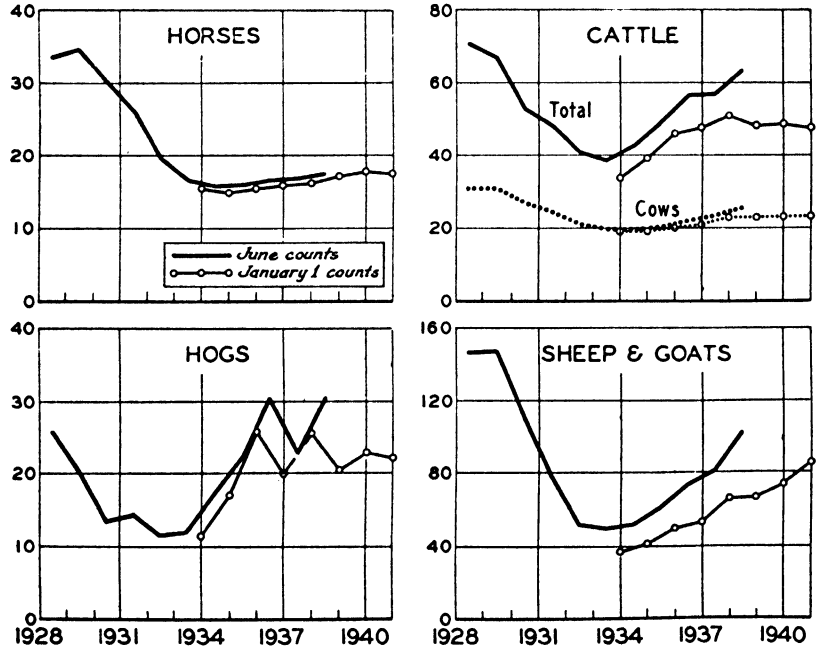
to 120 million in 1932 (end of year),[4] and were scarcely above one-third of the goal in that year.

Camels are used to a minor extent in Russia, mostly for field draft work in the semiarid regions of the Southeast, mainly Kazakhstan. Their almost complete annihilation in these years is worth mentioning. From 1,807,000 in 1928, camels declined to 277,300 in 1935.[5]

Characteristically, the large-scale socialized agriculture had to register its only success in rabbits—the typical animal of the smallest peasants and of small producers in general. While rabbits were so unimportant in 1928 that they were not covered statistically, the 2d Plan gave the number of rabbit does at the end of 1932 as 5.3 million.[6] Unfortunately, even in 1932 rabbits did not supply much more than one percent of the greatly curtailed meat output.

CHART 37.—LIVESTOCK ON FARMS, 1928–41*

(Million head)



* Data in Chart Appendix. Early summer counts, 1928–38 and January 1 counts, 1934–41. Year lines as of January 1.

[4] *2d Plan*, I, 232. Even this figure is too high.

[5] Figure for 1928 from Nifontov, *op. cit.*, p. 9; that for 1934 from *Socialist Reconstruction of Agriculture*, December 1935, p. 33.

[6] *2d Plan*, I, 232.

The decline in livestock in the early 'thirties was so disastrous (Chart 37) that the figures on livestock numbers for that period were withheld for years. Although they were finally disclosed in Stalin's speech to the XVIIth Party Congress, January 1934, the comparison between actual counts and the goals of the 1st Plan was never made and would still be taboo in the Soviet Union (Chart 36).

2D PLAN PERIOD

Goals.—The draft of the 2d Plan, published before Stalin's speech mentioned above, did not state the goals for livestock numbers. As incorporated in the final text, the goals of the 2d Plan were far from modest with reference to any kind of livestock, and were particularly ambitious for hogs, poultry, and rabbits. Both temerity and ignorance were needed to decide early in 1934 that hogs, which numbered 11.6 and 12.1 million in June 1932 and 1933 respectively, should amount to 43.4 million in June 1937. Provided feed can be made available, hogs are capable of increasing very rapidly, but not at the rate of 3.5 times in 3.5 years under the conditions that prevailed in Soviet agriculture at that time.

Poultry was to increase from 120 million in 1932 to 300 million in 1937, and rabbit does from 5.3 million to 17 million.[7] Biologically, such goals could easily have been fulfilled. But in the Soviet Union of 1934, where the population was almost entirely unfamiliar with the raising of rabbits, only in a dream could one see 17 million does or 300 million chickens available in the spring of 1937. It was expected, moreover, that considerably more meat would be produced per hog, chicken, and rabbit doe in 1937 than in 1932.

Facts.—The beginning of the upturn in livestock herds roughly coincided with the XVIIth Party Congress which approved the 2d Plan. About that time, the livestock sovkhozy and kolkhoz livestock fermy had begun to overcome the initial extreme disorganization. The most important fact was that the kolkhozniki were given a certain assurance with respect to their

[7] *2d Plan*, I, 232.

individual livestock holdings.[8] But the achievements during the 2d Plan Period were not even close to the goals. Cattle made the best showing, reaching about two-thirds of the expected increase. Little more than one-third of the scheduled increase in hogs was attained, and there were 15 percent fewer horses in 1937 than in 1932. The rabbits, concentrated in great numbers on large farms, fell prey to epidemics. Shortage of suitable feed was also a factor. The only information on rabbits later than 1935 that has come to the writer's attention indicates that rabbits largely disappeared.[9]

The livestock count of January 1, 1938, which was made the base of the 3d Plan for livestock, is of great significance in retrospect. In the case of cattle, one of the two bulwarks of animal husbandry, it represented the peak reached by socialized agriculture. Hogs, the second bulwark, had already reached the highest level in 1936, and the excellent 1937 grain crop failed to raise the level even slightly, unless there was some error in the estimates.

Hogs, which showed a strong upward trend both before and after the Revolution, were the only domestic animals more numerous on January 1, 1938 than before collectivization, with an excess of 17 percent. Cattle were around 10 percent below that level, and the deficiency in cows noticeably exceeded that in all cattle. By 1938, sheep and goats had recovered to only 70 percent of the 1928 level, while horses stood at 53 percent of that mark.

No data on poultry from 1934 to 1937 were released, but a poultry figure of 200 million was reported to the International Institute of Agriculture for 1938.[10] Thus the deficit in this stock, as compared with 1928, was reduced to about 7 percent during the 2d Plan Period. But evidence for 1939 indicates that poultry other than chickens increased from 16 million in 1928 to 56 million in that year.[11] Most or all of this shift probably occurred

[8] The close connection between the collectivization drive (especially the actions affecting peasant livestock) and the changes in herds is discussed on pp. 343–49.

[9] The goal for rabbits in kolkhozy (unoccupied territory) on January 1, 1943 was set at 929,000.

[10] *International Yearbook of Agricultural Statistics, 1940–41* (Rome, 1941), p. 170.

[11] D. Shepilov, *Socialist Kolkhozy Property* (Moscow, 1940), p. 109.

before 1938. Consequently the number of chickens alone in 1938 was probably 20 to 25 percent below the 1928 level.

Of the 16 million poultry other than chickens available in 1928, 10 million were ducks, 5 million geese, and one million turkeys. Turkeys, rather delicate birds, are not likely to have increased in numbers in the turbulent 'thirties. The whole increase in poultry other than chickens from 1928 to 1938 or 1940 must have been in ducks and geese. Further evidence of this is the frequent reference to a large increase in water birds.

The shift from chickens to water birds resulted from the shortage of feed adapted for chickens, especially from the reduced opportunity of keeping chickens on absolute feed[12] in peasants' yards and barns after the yards of the collectivized peasants had lost to the kolkhoz yards a considerable part of their previous functions. Ducks and geese, however, are kept on a different type of absolute feed. The turning of socialized agriculture to semiwild birds as a source of meat is an additional indication of its failure along more modern lines.

3D PLAN PERIOD

Goals.—The goals of the 3d Plan were less ambitious than those of the 2d Plan on the basis of the expected percentage increases, but they may be termed "even more unfulfillable." Their unrealistic nature is especially pronounced in the light of the fact that the upward trend of preceding years had already ended by January 1939, when the 3d Plan was approved.

Fortunately, the goals of the 3d Plan for livestock numbers in 1943 were given both for January 1 and for June.[13] The latter exceeded the counts of June 1928 (except as noted) and the 2d Plan goals for June 1937 by the following percentages:

Kind of animal	Excess over 1928 count	Excess over 1937 goal
Horses	−28.5[a]	8.3
Cattle	25.5	35.1
Hogs	135.4	41.0
Sheep and goats	46.7	124.2

[a] *Decrease.*

[12] Absolute feed is feed that can be used only by one type of animal, such as leaves for goats, or growths in ponds for ducks and geese.

[13] *Socialist Agriculture*, May 1939, p. 31.

Facts.—Approval of the ambitious goals of the 3d Plan by the Party and government did not turn the tide in livestock herds. Although horses, sheep and goats, and poultry continued to increase, the period between January 1, 1938 and the USSR's entrance into the war may properly be considered one of stagnation in livestock (Chart 37, p. 622). The rise in sheep numbers in 1939–40 was even fairly large, mainly for regional reasons, but moderate as compared with the goal. The rate of increase in horse numbers fell far short of the expected tempo. The two most important kinds of productive livestock, cattle and hogs, not only did not increase as scheduled but declined moderately (see Appendix Note M).

The livestock numbers on January 1, 1941, the last winter count before the German invasion, do not give ground for optimism as to the "immeasurable possibilities inherent in socialized agriculture." Ducks and geese, largely kept on absolute feed in rivers, lakes, and ponds, were the only type of domestic animals which exceeded the pre-collectivization level. While little came, ultimately, of the fantastic rabbit goals, rabbits also may have been more numerous in 1941 than before collectivization, when they were practically unknown in the Soviet Union.

Hogs, which had increased rapidly until 1936, were barely at the pre-collectivization level on January 1, 1941. No data on poultry numbers in 1941 were released. In 1940, the count for all poultry was above the pre-collectivization level, with a reported total of 238 million as against 216 and 200 million in 1939 and 1938.[14] Owing, however, to the large increase in poultry other than chickens after 1928, the number of chickens alone was still slightly below the pre-collectivization level. It may have reached this level by January 1, 1941, if the 1940 data are not for the end of the year and do not involve an enlarged territory.

Cattle, by far the most important domestic animals, num-

[14] The figure of 238 million is here treated as pertaining to the pre-1939 territory, because the trend in poultry was upward until January 1, 1939 and there is no definite evidence that the upward movement was arrested or reversed during 1939. The figure of 238 million may nevertheless have pertained to an enlarged territory, in which case everything said on poultry specifically for 1940 is incorrect.

bered about 15 percent below the pre-collectivization level on January 1, 1941, as against 10 percent below in 1938 (see p. 624). The number of cows remained virtually unchanged between 1938 and 1940, and their count on January 1, 1941 was only slightly further below the 1928 level than that of all cattle. The continued increase in sheep and goats in 1938–40 brought their numbers to within about 10 percent of the 1928 count. Thus, on January 1, 1941, there were more sheep and goats than cattle, relative to 1928. Instead of being greatly intensified, as would have been appropriate in view of the growth in population and as the Plans called for, the Soviet animal industry went the opposite way.

Less than 60 percent as many horses were available in 1941 as in 1929, the pre-collectivization peak. Camel numbers were certainly only a fraction of those available before the start of the collectivization drive.

Contrary to the Soviet practice, but quite properly, the analysis of the changes in livestock in 1938–40 are strictly limited in this study to the prewar territory.

Preparations for war.—The preparations for war had little effect on the changes in livestock herds in the second half of 1939 and in 1940. A relatively large number of horses was drafted for the army after the outbreak of war outside the USSR. But any deliberate policy of economizing on concentrated feed to increase the stockpiles of grain would not have affected horse breeding, although horses receive the largest grain rations among all domestic animals. The significance of horses for war purposes and as work animals would have outweighed considerations of economy on grain. Horses counted by the census—i.e., exclusive of army horses—would have numbered several hundred thousand more on January 1, 1941 had there been no additional drafts for the army.

Neither is it likely that preparations for war affected the herds of cattle, which normally receive very little grain in the USSR and may be kept without any grain. The failure of the socialized agriculture to produce enough roughage for the considerably reduced numbers of livestock, and the policy of further limiting the livestock holdings of the kolkhoz peasants, initiated

in mid-summer 1938, were the principal reasons for the break in the trend of cattle numbers.

The herds of sheep and goats, kept almost exclusively on roughage, could have been affected by the preparations for war only by a curtailing of sheep slaughter for the purpose of increasing the stockpiles of meat and fat on the hoof. While sheep and goats continued to increase in 1939 and 1940, this increase is unlikely to be attributable to a desire to have meat reserves in such form. Those portions of the additional sheep herds that were owned by the kolkhozy and sovkhozy, especially in the former nomadic and seminomadic areas, were not slaughtered even during the war; on the contrary, their further increase was fostered by the government. If a policy of economizing on feed did exist, the strengthening of kolkhoz livestock fermy and sovkhoz livestock farms was believed a more important task.

Hogs and chickens are the two kinds of domestic livestock most likely to be affected by a policy of increasing stockpiles of grain. However, there is no indication that the decline in hog numbers that occurred between 1938 and 1941 was brought about by such a policy. The government continued to encourage the expansion of hog herds in the kolkhozy and sovkhozy. The increase in the obligatory deliveries of grain by the kolkhozy since the 1940 crop occurred in compliance with the 3d Plan, approved before the start of war abroad. The pressure toward reduced livestock holdings of the kolkhozniki also began before the outbreak of the war in Western Europe and was not war-inspired. This pressure, it is true, may have been strengthened when the war started in 1939, and the decline in hog holdings in the next two years may have been the result of preparations for war.

Under entirely peaceful conditions, hog numbers by the end of 1942 might have reached or moderately exceeded the 1938 level. This would, of course, have been only trifling compared with the 3d Plan's target of doubling their numbers. But nothing better was possible with the plan for rapid expansion of feed production obviously failing.

The fact—if it is a fact—that poultry numbers continued to increase after September 1939 is a strong indication of the

absence of a deliberate policy of restricting feed use of grain. The increase in poultry numbers was fostered chiefly for the very holders (sovkhozy and commercial kolkhoz fermy) that used considerable amounts of grain as chicken feed. As in the case of hogs, no economy of concentrated feed for poultry appears to have been enforced on either the sovkhozy or the kolkhoz fermy.

Thus, if the Soviet Union had continued on a full peace basis until January 1, 1941, its population and livestock herds at that date in the pre-1939 territory in percent of corresponding figures for 1928, would probably have been roughly as follows:

Population	120
Animal numbers:	
Hogs	110
Poultry	110–115
All cattle	85– 90
Cows	85
Sheep and goats	100
Horses	60

War losses.—Eagerness has been displayed in advertising livestock losses in the overrun territories, but silence prevails on the losses in the territory never occupied. The only complete figures available are those for the herds at the beginning of 1946, and these are given neither in detail nor straightforwardly. They must be computed backward by deducting the percentage increases for the entire country during 1946 to 1950, as scheduled by the 4th Plan, from the sum of the livestock numbers expected to be available in each of the sixteen republics at the beginning of 1951 (pp. 630 and 632). Since the scheduled percentage increases are given only for the whole country, the 1946 stand also can be computed only for this. A comparison of the figures for livestock numbers in the whole of the USSR at the beginning of 1946 with the prewar herds in the USSR (adjusted to postwar boundaries by adding the prewar herds in the new territories) is the best indication that can be given of the decline in livestock caused by the war. The picture is necessarily very approximate. Some recovery in livestock numbers may have occurred in 1944 and 1945, and the USSR also obtained considerable numbers

of livestock from the defeated and "liberated" countries (Chart 36, p. 621).

Cattle, sheep and goats, the animals least dependent on concentrates, showed the smallest losses during the war (15 percent for cattle, 24 percent for sheep and goats). Horses naturally suffered greatly owing to losses in war operations; only half the prewar numbers of horses were available on farms at the beginning of 1946. The losses were, however, heaviest in hogs, which declined to little more than one-third of the prewar level. Poultry apparently suffered a similar reduction.

4TH PLAN PERIOD

Goals.—The law on the 4th Plan specifies the following percentage increases in livestock herds between the end of 1945 and the end of 1950:

Horses	46	Hogs	200
Cattle	39	Sheep and goats	75

The goal for horses indicates that less than half the heavy war loss is expected to be made up by the end of 1950 (see Chart 36, p. 621). Even this partial recovery would require a yearly increase of about 8 percent, an extremely ambitious goal considering the present shortage of draft power, and one that implies the breeding of every mare capable of producing a colt. Such a policy is hardly wise at this time, for a mare in foal cannot do as much work as an unbred mare. Breeding now means the sacrifice of a relatively little but badly needed work at the present time for much more work four to five years hence, when it will be needed much less urgently. The inevitable feed shortages are also a handicap. A similar situation prevailed in the years from 1934 to 1940. There was the same shortage of draft power and the same urging to breed every breedable mare. Yet horses increased only about 20 percent in six years, and the rate of increase was smallest in the early part of the period, when the supply of farm power was shortest.

The 4th Plan goals for productive livestock have two significant features. First there is a transfer of emphasis from hogs, maintained largely on concentrates—an emphasis very

pronounced in the 2d and 3d Plans—to cattle and to sheep and goats, maintained almost exclusively on roughage. The greatest emphasis is placed upon the raising of sheep and goats, the most extensive type of livestock farming.

This transfer of the emphasis to livestock maintained on roughage cannot be explained by the effects of war and they were a secondary factor if any. Analysis of the feed resources (pp. 607–12) showed that the respective provisions of the 1st and 2d Plans put their emphasis on concentrates. The 3d Plan provided for large increases in both concentrates and roughage. The 4th Plan was, however, less optimistic over the possibilities of enlarging grain production and, consequently, of having much grain for feed. The Plan, indeed, does not provide for as many hogs on January 1, 1951, as existed on January 1, 1938. The trebling of hog numbers in five years, as provided by the Plan, would be easy if the feed resources were adequate. They certainly would have planned for a larger number of hogs if they were sure of having all the grain planned for.

Cattle at the end of 1950 are scheduled to exceed the 1938 level moderately, and sheep and goats to exceed it considerably. Thus the tendency for sheep and goats to gain on cattle, already noticeable in the last prewar years, is expected to make further progress in the postwar five-year period. As in the case of hogs, the attainment of the goals for cattle and sheep and goats will be mainly a question of feed, although a different type of feed. But the planned large increases in these animals also imply that a large part of the yearly production will go into the stock and consequently will not be immediately converted into food. Thus, as the breeding of mares sacrifices present work for future work, the increase in productive livestock sacrifices food now for much greater quantities in a few years.

With reference to all livestock, there will be institutional difficulties to overcome in reaching the goal of the 4th Plan, which is based mainly on a large increase in collectivized kolkhoz livestock (see chapter xv).

Facts.—Instead of increasing according to plan, livestock herds declined during 1946, except for horses which increased, though less than half as much as planned (see tabulation, p. 632).

The draft was blamed for this. Absence of statistics prevents reaching a decision as to what the herds would be if weather were normal, but the goals would certainly have been missed. The 1946 failure was not believed sufficient reason for revising the 1951 goal of the 4th Plan. The Party resolution of February 1947 simply redistributed the increases needed to reach the 1951 goals among the remaining four years, as follows (data in million head):[15]

January 1	Horses	All cattle	Cows	Hogs	Sheep and goats
Actual, 1946..	10.1	47.0	....	10.4	69.4
Actual, 1947..	10.8	46.8	....	8.6	69.1
Goal, 1948....	11.9	52.0	24.7	13.4	84.7
Goal, 1949....	12.9	56.1	27.2	20.3	97.8
Goal, 1951....	15.3	65.3	....	31.2	121.5

If the boosted goals for the year 1947, reflected in the goal for January 1, 1948, are not reached, as they probably will not be, the unfulfilled portions may be added to the assignments for 1948–50.

REGIONAL VARIATIONS

Important regional variations may be observed in the rates of decline and succeeding recovery of livestock, especially of cattle and sheep, in the 'thirties. While livestock were greatly curtailed in all areas during the collectivization drive, they were nearly annihilated in the former nomadic and seminomadic regions. The vast pasture lands of these areas remained largely unused at the very time when the sorely needed livestock in other parts of the country were being slaughtered because of the feed shortage. Yet this waste of pasture was a minor evil compared with the loss of human life that followed the annihilation of that livestock.

Since animals are not shipped into the former seminomadic and nomadic areas, the recovery from the desperate position into which collectivization had plunged their livestock industry could proceed only slowly. By the time the productive livestock in most other areas had nearly or fully reached their prewar levels,

[15] Data for 1946 and 1951 implied in the 4th Plan; data for 1947–49 from the Party resolution of February 1947.

herds in the former nomadic and seminomadic areas were still at a fraction of their pre-collectivization size. The restocking of herds in those areas continued, in compliance with government orders, throughout the first war years when, under other conditions, the war emergency would have made a curtailment appropriate. This development applied especially to sheep, the principal animal of those areas.

Kazakhstan and Kirghiz, which had 20 percent of all Soviet sheep and goats in 1928, lost more than five-sixths of their herds in the next five years (Table 48). The decline in sheep and goats was large also in the adjacent territories of the other Central-Asiatic republics and West Siberia. Between 1928 and 1933, these three territories combined lost almost 45 million sheep and goats—nearly four-fifths of their total. While the decline in sheep and goats was large in all other areas (from 91.2 million in 1928 to 38.5 million in 1933), it was not quite as violent as in the former nomadic and seminomadic areas.

The cattle and horse herds of these areas also suffered extreme losses in 1928–33, nearly four-fifths of the former and seven-eighths of the latter disappearing from the pastures of Kazakhstan and Kirghiz. These territories, with the remaining Central Asia and West Siberia, accounted for more than one-third of the total loss in cattle and horses of the entire Union.

Camels were rather important in Kazakhstan before the collectivization avalanche. Most of the Union's camels were indeed concentrated there. By 1934, their numbers in Kazakhstan had been reduced to 7 percent of the 1928 count.[16]

The natural result of the annihilation of Kazakhstan's livestock was a decline in the Kazakhi[17] population, most of whom depended entirely upon their animals for a livelihood. A rough computation, with the normal increase considered, indicates that the nation which counted only four million persons in 1926, lost one and one-half million between 1926 and 1939 (see p. 323).

Recovery in the nomadic and seminomadic areas, more than

[16] Figure for 1928 from Nifontov, *op. cit.*, p. 17; that for 1934 from I. A. Kraval, "Upswing in Animal Husbandry," *Socialist Reconstruction of Agriculture*, December 1935, p. 33.

[17] A Turkic-Mongolian tribe, not to be confused with the Cossacks, who are Slavs.

TABLE 48.—LIVESTOCK IN SPECIFIED AREAS AND SPECIFIED YEARS, AND PLANNED FOR 1951*

(*Thousand head*)

Year	USSR total	Kazakhstan	Central Asia		West Siberia[a]	Ukraine	White Russia	Moscow oblast	Leningrad oblast
			Kirghiz	Other					
	Horses								
June									
1928....	33,537	3,735	661	742	3,530	5,487	1,079	363	513
1933....	16,575	459	387	536	1,341	2,601	783	251	366
1936....	16,649	544	333	528	1,271	2,793	707	247	357
Jan. 1									
1935....	14,932	422	278	472	1,323	2,415	680	236	362
1938....	16,221	639	362	548	1,290	2,937	633	220	325
1951									
(goal)	.....	*1,516*	*490*	*739*	....	....	...	...	...
	Cattle								
June									
1928....	70,541	7,379	862	3,032	6,739	8,605	2,218	642	1,203
1933....	38,380	1,594	386	1,663	3,038	4,446	1,565	601	872
1936....	56,691	2,808	436	1,838	4,748	7,690	2,359	799	1,093
Jan. 1									
1935....	38,869	1,836	316	1,411	3,496	4,960	1,492	506	816
1938....	50,921	3,095	486	2,144	4,570	7,759	1,905	564	835
1951									
(goal)	.....	*4,400*	*560*	*2,780*	....	....	...	...	...
	Hogs								
June									
1928....	25,989	304	30	5	2,422	6,963	2,399	397	308
1933....	12,068	139	35	40	950	2,089	1,548	295	249
1936....	30,457	632	122	219	1,846	7,101	2,202	548	567
Jan. 1									
1935....	17,116	276	71	97	1,241	3,797	1,480	355	401
1938....	25,716	368	91	120	1,539	7,730	1,951	401	502
1951									
(goal)	.....	*392*	*60*	...	....	....	...	...	...
	Sheep and goats								
June									
1928....	146,699	25,916	5,501	13,104	10,664	8,112	3,817	1,389	1,365
1933....	50,206	2,725	1,290	4,640	3,041	1,987	1,845	731	905
1936....	73,657	5,222	1,779	6,357	5,391	3,573	1,291	667	1,063
Jan. 1									
1935....	40,771	2,618	967	4,220	3,046	1,767	752	426	836
1938....	66,595	5,288	1,886	7,445	5,183	3,301	1,077	555	893
1951									
(goal)	.....	*19,050*	*4,300*	*17,610*	....	....	...	...	...

* Data for 1928 through 1938 from *Animal Husbandry USSR, 1916–38*, Gosplan (Moscow, 1940). Goals for 1951 are from the *4th Plan*. Data for 1951 are given only for those republics for which no changes in boundaries took place. [The writer regrets the clumsy form of the table, but nothing better can be done with the available statistics.]

[a] Novosibirsk, Omsk, and Altai oblasti.

in any other part of the country, depended upon relaxation of the stringent initial regulations and practices that accompanied the collectivization drive (see pp. 343–49). By 1938, productive livestock in Central Asia (excluding Kirghiz) and West Siberia had approached the pre-collectivization level. Kazakhstan and Kirghiz more than doubled their cattle and sheep during the recovery period, but they still had only half as many cattle and less than one-third as many sheep on January 1, 1938 as before collectivization. With these three territories (Kazakhstan, all of Central Asia, and West Siberia) excluded from the total, cattle in the Union were fully restored to the pre-collectivization level by 1938, while sheep and goats were still about 25 percent below that level.

Few regional data on livestock numbers between 1938 and the beginning of the war in the USSR were published; but they were eagerly provided for Kazakhstan, where sheep continued to increase rapidly, and other animals at a slower rate, not only until 1941 but also during the first war years.[18] In Kazakhstan and Kirghiz, sheep and goats are expected to more than treble from January 1, 1938 to January 1, 1951 (Table 48, p. 634). On this date sheep and goats in that territory are scheduled moderately to exceed the pre-collectivization level. Even in the unlikely event that the goal is reached, the price paid for the collectivization of the Asiatic seminomads will be equivalent to almost twenty years of underproduction, starvation, and death.

In other parts of Central Asia, sheep and goats are scheduled greatly to exceed the pre-collectivization level by the beginning of 1951. The sources of feed for the additional sheep are not mentioned. It would not be advisable to use much alfalfa hay for this purpose, though its production is expected to expand considerably.

The Ukraine provides another example of the effect of super-rapid collectivization on the livestock herds. By June 1933 the

[18] Writing in February 1947, the head of the government of Kazakhstan claimed that all kinds of livestock had increased by two million head since before the war. See *Socialist Agriculture*, Feb. 5, 1947. Some other claims are even much higher. The cited evidence is, incidentally, an example of the objectionable practice, frequently resorted to of late, of lumping together all livestock in one figure without conversion to a uniform basis.

Ukraine had lost 48 percent of all her cattle, 53 percent of her horses, 70 percent of her hogs, and 75 percent of her sheep. Recovery was rapid, however. By 1938 hog numbers considerably exceeded the pre-collectivization level, and cattle approximated it. Sheep and goats, while expanding rapidly, could reach only about 60 percent of the pre-collectivization level. Little progress was made in restoring the horse herds.

The collectivization drive proceeded much more slowly in central and northern European Russia than in the steppe areas, and this was clearly reflected in a much smaller decline in livestock in the early 'thirties (see Moscow and Leningrad oblasti, and White Russia, in Table 48, p. 634). However, the recovery of livestock there was also slow. Around 1938 little difference in the degree of recovery could be observed between southern European Russia on the one hand and central and northern European Russia on the other.

Under normal conditions, the great influx of urban population in the 'thirties would have led to a large increase in suburban dairying. Such a development would have been particularly desirable in the Soviet state. The kolkhozniki, the principal sellers of milk, had been prohibited from dealing with intermediaries, with the result that direct purchases from near-by producers had to play a much bigger role than was good for the productivity of labor of those buying and, especially, those selling the milk (see page 385). In spite of this, the number of cows in Leningrad oblast showed no signs of recovery from 557,700 head, to which level, by the spring of 1933, it had fallen from 764,200 in the spring of 1928. Nor in Moscow oblast, where the decline in cows from 1928 to 1933 was very small, was there any sign of exceeding the previous level.

Thus the regional analysis supports the conclusions reached from the analysis of data for the entire Union: the saturation level of socialized agriculture for all livestock proved considerably below the pre-collectivization level, if it is considered that the great reduction in horses should have correspondingly increased the saturation level for productive livestock.

While Kazakhstan and possibly some other eastern territories continued to increase their herds during the war, the west-

ern portions of European Russia, invaded by the enemy, suffered heavy losses of livestock amounting to almost complete annihilation in some areas. In most of the uninvaded territories, with the exceptions previously noted, livestock also declined during the war. On the whole, a very pronounced shift of livestock eastward occurred. Students must be on the lookout for the substantial effects of this shift on the average return of meat and milk per available animal.

CHAPTER XXVII

ANIMAL PRODUCTS

MEAT[1]

1st, 2d, and 3d Plans.—The general features of the meat provisions of the first three Plans have been treated in chapter iv (see especially Chart 6, p. 73). Although the 1st Plan called for increases of 36.9 percent (basic variant) or 53.5 percent (maximum variant), meat output in 1932 was less than two-thirds that of 1927–28 (Chart 38). The 2d Plan stipulated that the output of the principal meats be more than doubled. Actually it remained virtually unchanged. The 3d Plan specified almost a trebling of the meat output. In 1938 an increase of nearly a million tons occurred—almost a quarter of the entire increase planned for the five-year period. This large increase was, however, due to the change from an upward to a downward trend in livestock herds (pp. 645–46). The 1938 level of meat production was never again reached. The 1942 meat production would have missed the goal by a wide margin—probably by almost 75 percent of the expected four-million-ton increase—even if there had been no war.

In view of the desperate meat supply situation and the need for a rapid rehabilitation of meat production, the 2d Plan naturally concentrated on the types of livestock that multiply rapidly—hogs, chickens, and rabbits. The Plan provided for a fourfold increase in the output of pork and hog fat,[2] and specified that these items comprise 59.5 percent of the total output of the principal meats in 1937 (as against 27.5 percent in 1932). The production of poultry and rabbit meat was to increase 4.5 times during the period.

It may never be known to what extent the 1937 goals for pork

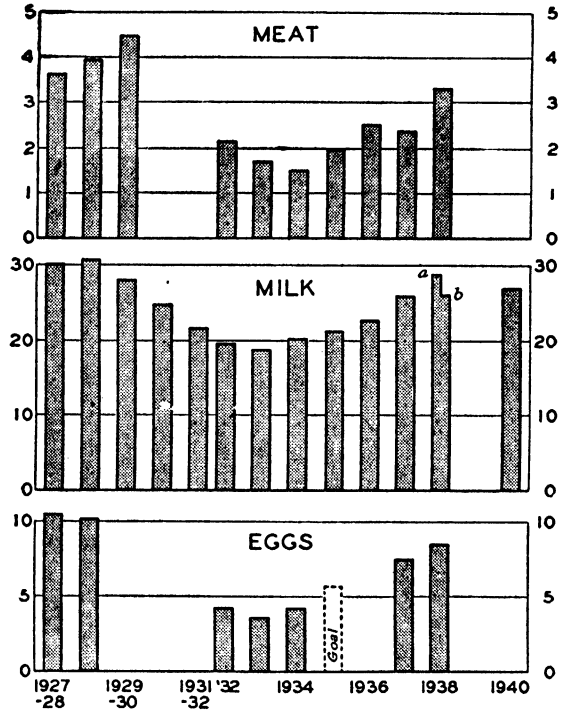
[1] The term "meat," without qualification, formerly included only beef, veal, pork, mutton, and goat meat. It was expressed as carcass weight, excluding offal but including hog fat. Since the 'thirties the term has often been misused. Poultry and rabbits are sometimes included, and meat is frequently expressed in terms of live weight with no indication to that effect.

[2] *2d Plan*, I, 233.

and, especially, for poultry and rabbit meat were intended to serve merely as propaganda. In any case, the plan for pork and hog-fat production missed fulfillment by more than 50 percent, and the goals for poultry and rabbit meat by even wider margins. The proportion of pork and poultry in the total meat supply did increase, but chiefly because of the low level of output of beef,

CHART 38.—OUTPUT OF MEAT, MILK, AND EGGS, 1927–28 TO 1940*

(Million tons of meat and milk; billion eggs)



* Data in Chart Appendix. Data for eggs in 1937 and 1938 are the writer's estimates.
[a] Preliminary official. [b] Maximum in writer's opinion.

mutton, and goat meat. Yet this unfavorable development was widely advertised as an improvement in the composition of meats.[3] Thus, while the meat goals may have been mainly propaganda, the very failure to meet them was twisted to the same use.

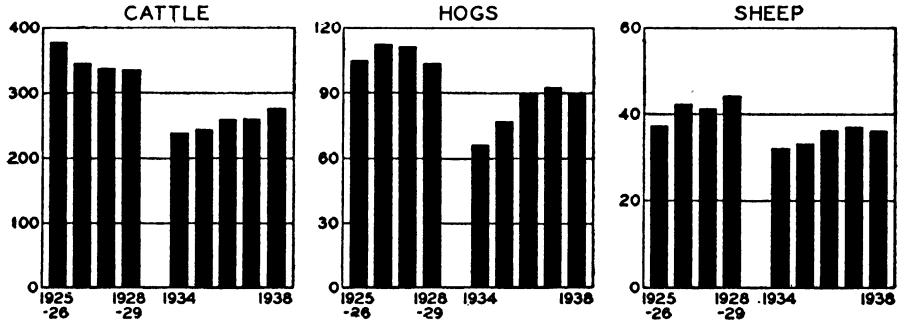
The meat industry at outbreak of war.—The quality of meat in pre-Revolutionary Russia was notoriously poor. Cattle and

[3] See, for example, *Socialist Agriculture USSR, 1938*, Gosplan (Moscow, 1939), p. 74, and *Socialist Construction USSR, 1933–38*, Gosplan (Moscow, 1938), p. 78.

sheep delivered for slaughter were either poorly finished or, more commonly, not finished at all, while a large proportion of the slaughtered hogs were essentially lean animals with a thick outer layer of fat. The collectivization drive brought about a great deterioration where no more would have seemed possible. Chart 39 shows that in 1934 the average live weights of animals obtained by the government on obligatory delivery were less than the weights of the same animals procured by the government and

CHART 39.—AVERAGE SLAUGHTER WEIGHTS, 1925–26 TO 1928–29, AND 1934 TO 1938*

(Kilograms live weight)



* Data in Chart Appendix. Weights in 1925–26 to 1928–29 are of animals procured from socialized sector in RSFSR; in 1934–38 of all animals in obligatory deliveries.

co-operatives in 1927–28 by the following percentages: cattle, 29.5; hogs, 41.4; sheep, 21.0. While the situation improved after 1934, the pre-collectivization level was still far from being reached by 1938.[4] Moreover, the improvement was apparently not so large as the averages in Chart 39 indicate. The Commissar of the Meat and Milk Industry emphasized that only 7.2 percent of the cattle slaughtered in 1939 was classed as fat or over-average in finish.[5] Boiko complained of deteriora-

[4] The 1934–38 data in Chart 39 pertain only to obligatory deliveries from the kolkhozy, kolkhozniki, and individual peasants, but "the average weights of the sovkhoz livestock also are very low, and only little higher than those of the other sectors" (Boiko, "Let Us Give to the Packing Industry High-Quality Raw Material and . . . . Reduce the Seasonality of Its Operations," *Meat Industry of the USSR*, February 1940, p. 6).

[5] P. V. Smirnov in *Meat Industry of the USSR*, April 1940, p. 2. The percentage of such cattle was higher than this even in 1934–37; it was lower only in 1938 when the crop failure forced much emergency slaughtering (see Boiko, *loc. cit.*). Moreover, Smirnov spoke of all cattle slaughtered, while Boiko's figures pertain to obligatory deliveries only. Specifically, fat cattle made up only 0.8 percent (1938) to 2.7 percent (1935) of the total obligatory deliveries.

tion in the quality of hogs delivered to the state between 1935 and 1938.[6] Smirnov compared the average carcass yields in the USSR and the United States in 1938 as follows (in percent of live weight):[7]

	USSR	U.S.A.
Cattle	43.8	53.6
Hogs	60.9	74.9
Sheep	40.9	47.0

Around 1939 the favorite lure held out to producers was that if they would deliver better livestock, fewer would be needed to fulfill their obligations, and the herds could be increased much more rapidly (cattle and hogs were actually declining at that time). Boiko, for example, computed that only two-thirds as many hogs and half as many cattle and sheep need have been delivered had they been normally finished.[8]

Another adverse feature of the slaughter-animal situation of that time was the increased delivery peak in October–December. The output of meat by state establishments in those months amounted to 46.8 percent of the year's total in 1937 and 43.7 percent in 1938 and 1939, and was expected to exceed 50 percent in 1940.[9] Slaughter houses were receiving 15 to 20 percent of their yearly totals in a single ten-day period according to Boiko, who wrote:

> Great masses of livestock accumulate in the receiving points of the procurement organizations and around them (with no adequate food supplies; directly under the sky). The railways can not provide the needed cars. As the result, great losses in weight and finish; reduction in finish; and so on, which amounts to millions of rubles and thousands of tons of meat. For example, the losses in October–December 1938 in Altai oblast amounted to 75 percent of the planned meat procurements in April–June 1939.[10]

Even in Moscow, where the seasonal curve was smoother, the livestock delivered in the five months of January–May 1939 amounted to only 33.7 percent of the yearly total, while 27.3 percent was delivered in October–November.

The procurement organizations had to go into the finishing business on a considerable scale, but the results were deplorable.

[6] Boiko, *loc. cit.* [7] Smirnov, *loc. cit.* [8] Boiko, *op. cit.*, p. 7.

[9] *Meat Industry of the USSR*, August 1940, p. 1. It was 40.1 percent in 1929–30 and 24.2 percent in 1930–31 according to V. P. Nifontov, *Animal Husbandry of the USSR in Figures* (Moscow, 1932), pp. 298–99. [10] Boiko, *op. cit.*, p. 9.

In 1937, in the Ukrainian establishments, 27.5 and 18 kilograms of feed were required to produce a gain of one kilogram in the weights of chickens and geese respectively, as against the expected 7 to 8 kilograms.[11] The finishing by procurement organizations often only restored the weight lost while the animals awaited slaughter.

In view of the steep seasonal curve in meat output and the limited cold-storage facilities, meat was a highly seasonal commodity in the USSR.[12] The great irregularity in meat output was apparently strengthened by a peculiar treatment of the sausage industry. Elsewhere, factories processing meat into sausage and smoked goods act as a buffer against the seasonal variations in meat output. In the Soviet Union, sausage factories are operated at capacity. Instead of processing meat not absorbed by the fresh-meat market, they are given the first claim on the meat owned by the state. Owing to this, as well as to the large share that sausage and cured goods ultimately acquired in total meat output,[13] all or nearly all of the meat produced by the state establishments was processed to sausage and bacon during the slack season in meat output, and practically none was sold fresh.

It is shown in Appendix Note K that the consumer has to buy bread when he wants grain or flour. The 4th Plan intends to force him to buy cigarettes when he wants tobacco (pp. 585–86). The same is true of sausage and meat. The output of sausage and bacon increased from 60,000 tons (5 percent of the marketed meat) in 1928 to 395,000 tons (19.2 percent) in 1938.[14] In one decade the Soviet people became wurst-eaters. Such a change does not occur voluntarily.[15]

The sausage factories obviously worked to capacity even in the slack season, in accordance with the policy of sponsoring state industry by every means. The special methods of forcing sausage on the consumer also are likely to have been more

[11] *Meat Industry of the USSR*, March 1939, p. 20.

[12] *Ibid.*, June 1940, pp. 11–13.

[13] In 1938, 45.4 percent of all meat sales of the state consisted of these goods.

[14] *Socialist Construction USSR, 1933–38*, p. 77, and other official sources.

[15] Official pronouncements hail the great increase in the proportion of sausage to total meat output, certainly resented by the consumers, as an improvement on the food front. See, for example, *Socialist Construction USSR, 1933–38*, p. 78.

effective at a time when the total supplies of fresh meat in government hands were small. In periods of relative abundance the customer may have been able to resist sausage more successfully.[16]

The quality of sausage, as of bread, is poor.[17]

Production, 1928–40.—This discussion of quantitative problems follows that of qualitative problems, because an acquaintance with the latter helps one to understand some of the questions concerning the quantities of meat produced.

The Gosplan estimated the production of meat in 1927–28 (apparently the crop year) at 4.21 million tons.[18] The Central Statistical Board, however, gave it at only 3.64 million,[19] and practically the same figure was retained by the Central Office of Economic Accounting (successor to the Statistical Board) in Nifontov's comprehensive study of the livestock industry, published in 1932.[20] The study contained detailed regional data on slaughtering by kinds of animals and age groups, and on slaughter weights. The same Nifontov, a few years later, published considerably reduced figures on meat output in 1927–28 and adjacent years.[21] His 1932 and 1937 estimates compare as follows (in thousand tons):

Year	Estimate in 1932	Estimate in 1937
1927–28	3,611	3,062
1928–29	3,940	3,408
1929–30	4,473	3,611

[16] The consumers certainly cannot avoid buying state-produced bread, however. The fact that grain can be stored precludes the necessity of making concessions to them. The consumer, if he wants to eat breadstuffs, has to buy them in the finally processed form the year around. See Appendix Note K.

[17] The practice of putting a great deal of water in the bread has been mentioned (page 558, n. 39). The same is true of sausage. American bologna, a rather watery product, contains 34 to 36 percent dry matter (Charlotte Chatfield, *Proximate Composition of American Food Materials*, USDA Circ. 549, 1940, p. 77). A type of sausage called "tea sausage," widely used in Russia, contains only 25 to 28 percent dry matter (S. A. Ermilov and others, *Commercial Food Products*, Moscow, 1945, p. 476). On the basis of Ermilov's data the water-protein ratio of this sausage is at least 5.5 to 1, while the maximum permitted for bologna by United States standards is 4.4 to 1. Another source (B. D. Stepanov, *Organization of Production in Meat Establishments*, Moscow, 1946, p. 152) indicates an even smaller content of meat in sausage than does Ermilov. Factories producing sausage with a low meat content are praised in the USSR (*Meat Industry of the USSR*, August 1938, p. 2).

[18] *1st Plan*, II, Part 1, p. 330.

[19] *Statistical Handbook USSR, 1928*, Central Statistical Board (Moscow, 1929), p. 226.

[20] Nifontov, *Animal Husbandry . . . .*, pp. 160–61.

[21] V. P. Nifontov, *Production of Animal Products in the USSR* (Moscow, 1937), p. 69.

Unlike the earlier study, the 1937 publication gave only the data, without particulars, and it failed even to mention that the estimates differed from those published earlier by the same author. Also, while Nifontov's 1932 estimates were reported to the League of Nations, those of 1937 were not.[22]

Table 49 is compiled to permit a check of the meat-output figures by livestock numbers and slaughterings. The material is

TABLE 49.—DATA RELATING TO MEAT PRODUCTION*

Year and month	Number (*million head*)			Year[a]	Meat production[b] (*thousand tons, carcass weight*)			
	Cattle	Hogs	Sheep, goats		Cattle	Hogs	Sheep, goats	Total
1927, June	68.0	23.2	139.7	1927–28..	1,522	1,347	741	3,611
1928, June	70.5	26.0	146.7	1928–29..	1,842	1,318	780	3,940
1929, June	67.1	20.4	147.0	1929–30..	2,354	1,057	1,061	4,473
1930, June	52.5	13.6	108.8		....	....	....	....
1931, June	47.9	14.4	77.7		....	....	....	....
1932, June	40.7	11.6	52.1	1932.....	1,083	640	420	2,143
1933, June	38.4	12.1	50.2		....	....	....	....
1936, Jan. 1 ..	(46.0)	(25.9)	(49.9)					
1936, June	56.7	30.5	73.7	1936.....	....	....	....	2,500
1937, Jan. 1 ..	(47.5)	(20.0)	(53.8)					
1937, June	57.0	22.8	81.3	1937.....	1,020	1,000	350	2,370
1938, Jan. 1 ..	(50.9)	(25.7)	(66.6)					
1938, June	63.2	30.6	102.5	1938.....	1,295	1,564	444	3,303
1939, Jan. 1 ..	(47.9)	(20.5)	(67.5)					

* Data for 1927–28 to 1929–30 from Nifontov, *Animal Husbandry* . . . . , pp. 4 and 160–61. Livestock numbers for other years from *Animal Husbandry USSR, 1916–38*, Gosplan (Moscow, 1940), p. 4. Meat output for other years from *Socialist Agriculture USSR, 1938*, pp. 73–74, and other official sources.

[a] October–September for the years 1927–28 to 1929–30. Others are calendar years.

[b] Slaughter figures are available only for three years as follows (in million head):

Year	Cattle	Hogs	Sheep
1927–28	20.25	25.57	43.02
1928–29	25.82	24.55	46.83
1929–30	33.00	21.89	64.39

Data from Nifontov, *Animal Husbandry* . . . . , pp. 164–65.

unfortunately incomplete, because slaughter data are available only for the pre-collectivization period. If Nifontov's estimates of meat output in the late 'twenties made in 1937 are substituted for those made in 1932 (used in Table 49), they do not seem

[22] The League of Nations' *Statistical Yearbook, 1940–41*, p. 81, still contained the original estimates.

to agree well with data for later years. The herds were not inconsiderably larger in 1927–28 than in 1937;[23] the increase in the herds during 1927–28 was smaller than during 1937;[24] and average slaughter weights were greater in 1927–28 than in 1937.[25] The greater increase in herds in 1937 may alone have depressed that year's meat output as much as 400,000 tons. On the basis of these factors, the 1927–28 meat output must have exceeded that of 1937 by more than the 30 percent indicated by Nifontov's later figure for 1927–28. Even if allowance is made for the favorable effect on meat output of the unusually good feed crop (including pastures) in 1937, the figure of 3,062,000 tons for 1927–28 is still inconsistent with the 2,370,000 tons given for 1937.

This revised figure for 1927–28 is also difficult to reconcile with the preliminary estimate of a meat output of 3,303,000 tons in 1938, especially since allowance must be made for the unfavorable effect of the poor feed crop and pasturage on meat output in 1938.

Nifontov's figures from his 1932 book are here accepted for the meat output in 1927–28 through 1929–30. The pre-collectivization level of the meat output is believed to have been 3,850,000 tons, allowing close to 250,000 tons of meat-equivalent in the livestock added to the herds in 1927–28.

The official preliminary figure for meat production in 1938 is 3,303,000 tons. The jump of almost a million tons in one year is deceptive at first glance. If the effect of the changes in herds in both years is eliminated, the meat output in 1937 is about 3,050,000 tons and that of 1938 about 2,800,000 tons. Thus there was a decline by about a quarter of a million tons

[23] Averages of the spring counts in 1927 and 1928 of productive livestock exceeded the spring 1937 figures by the following percentages:

Cattle	21.5	Sheep and goats	76.1
Hogs	7.7		

[24] The herds increased as follows during 1927–28 (between spring counts) and 1937 (Jan. 1, 1937 to Jan. 1, 1938) in million head:

Stock	1927–28	1937
Cattle	2.5	3.4
Hogs	2.9	5.7
Sheep and goats	7.0	12.8

[25] See Chart 39, p. 640. While estimates of the average weights of all slaughterings in the late 'thirties are not available, no doubt can exist that they declined from pre-collectivization levels. Only the magnitude of the decline is open to question.

in 1938. The fact that feed crops (including pastures) were good in 1937 and poor in 1938 accounted for the difference. Except for the effect of the poor crop, the meat-output capacity in 1938 would have been close or equal to 3,000,000 tons, or little more than 75 percent of the 1927–28 production level.

No official figure on meat production in any year after 1938 appears to have been released. The decline in total productive livestock after 1938 is unlikely to have been compensated in 1939 and 1940 by an enlarged meat output per animal. Since the herds were about stable in 1939 and 1940, there was also no windfall meat and the output of principal meats in 1939 and 1940 probably was about 3 million tons.

Poultry-meat production, which was roughly calculated at 247,000 and 270,000 tons in 1928 and 1929, amounted to 151,400 tons in 1932 and 130,000 tons each in 1933 and 1934.[26] For 1938 it was estimated at 299,400 tons.[27] The excess over the pre-collectivization level must have been even larger in 1940. For rabbit meat, figures appear to have been given for only 1933 (46,000 tons), 1934 (75,000 tons), and 1935 (110,000 tons).[28] The consideration of poultry and rabbits brings the total meat supplies available in 1938–40 somewhat closer to the pre-collectivization level.

Prewar distribution and consumption.—Marketings of meat increased from 35 percent of the total production in 1927–28 to 59 percent in 1937.[29] As in the case of other products, official spokesmen took great pride in this large increase. Also as in other cases, they failed to state that, in the face of the substantial decline in production, those increased marketings implied an even greater curtailment of consumption by the producers than would otherwise have occurred as a matter of course.

The following tabulation, based on official data, suggests the trend of meat supplies available for consumption by producers (in million tons):

[26] Data for 1928 and 1929 from Nifontov, *Animal Husbandry . . . .*, p. 155; for 1932, from *Socialist Agriculture USSR, 1938*, pp. 73 and 74; for 1933 and 1934, from *National Economic Plan for 1935*, Gosplan (2d ed., Moscow, 1935), pp. 612–13.

[27] *Socialist Agriculture USSR, 1938*, pp. 73–74.

[28] *National Economic Plan for 1935* (2d ed.), pp. 612–13, and *National Economic Plan for 1936* (2d ed.), p. 444. The data were designated "calculated" in the first source.

[29] *Socialist Agriculture USSR, 1938*, p. 74.

	1927–28	1932	1937	1938
Production	3.61	2.14	2.37	3.30
Marketings	1.22	0.70	1.70	2.06
Available for producer consumption	2.39	1.44	0.67	1.24

Thus meat marketings increased by more than 60 percent from 1928 to 1938, while the quantities remaining to the rural population declined to little more than half the pre-collectivization level.

Postwar.—Meat production probably amounted to 2 million tons or slightly more in the enlarged territory in 1946. But this occurred only at the expense of a decline in herds during the year. Had the urgently needed rebuilding of herds taken place, the output would have been reduced to or below 1.5 million tons, and less than 10 kilograms per capita would have been available.

The 4th Plan is silent on meat production except for such generalities as the request to improve the productivity of livestock. Any inferences must be drawn from data on expected changes in herds and their distribution among the different owner groups. The livestock count of January 1, 1951 is expected to show 10 percent more cattle and 65 percent more sheep and goats than the count of January 1, 1938, but a slight decline in hogs (see Chart 36, p. 621). With the yield of meat per animal at the prewar level, and with no further increase in the herds during 1950, the scheduled livestock herds would yield slightly more meat than the postwar territory produced before the war, or, say, 4 million tons. But the scheduled herds will probably not be reached, and the Soviets are unlikely to be satisfied with stabilizing the herds at the 1950 level; hence part of the potential meat output of 1951 will be used for enlarging the stocks. The meat output is therefore likely not to exceed 3 millions tons in 1951 and may be below that figure in 1950, the last year of the 4th Plan Period.

That meat production is not expected to be large in 1950 is apparent from the fact that the output of meat by the state industry in the enlarged territory in that year is estimated at 1,300,000 tons, as against an output of 1,140,000 tons in the

prewar territory in 1938.[30] Considering the rapidity with which the taking over of all farm products, and specifically of meat, by the state is normally increasing, it is obvious that the total meat output in 1950 is expected to be considerably below the prewar level in both the prewar and postwar territories.

MILK[31]

1st, 2d, and 3d Plans.—The first three goals were discussed in chapter iv (see especially Chart 6, p. 73). The milk-production goals were more nearly attained than those for meat, simply because they were set at less immoderate levels. Yet the record was poor enough. Early in 1934 the 1937 milk-production goal was fixed at 32.4 million tons; the actual output proved to be only 26 million and would have been slightly short of 25 million if the weather had been normal.

Production, 1928–40.—For the excellent crop year 1937 the following official data are available:

Number of cows, January 1, 1937	23.0 million
Number of cows, July 1, 1937	23.3 million
Total milk output, 1937	26.1 million tons

The figures imply a yield of milk per cow of around 1,100 kilograms. Since the average was 1,000 kilograms in pre-collectivization time,[32] an increase by 10 percent is indicated. Favorable weather in 1937 and changes in the regional distribution of the cows, more favorable for the milk yield, may account for all of this difference.

As to milk yields per cow of the various groups of owners in 1937, the following data were given (in kilograms):[33]

Kolkhozy	1,027
Sovkhozy	
Dairy-beef	1,458
Sugar-beet	1,802

[30] *4th Plan* (Sec. 2) and *Socialist Construction USSR, 1933–38*, p. 77.

[31] According to the *Dictionary-Handbook on Social-Economic Statistics* (Moscow, 1944), pp. 99–101, milk output includes all milk—cow, goat, ewe, and mare. This, however, seems to be the first official indication that any but cow's milk is included, and most sources appear to ignore all other kinds in their discussions. Earlier statistics, such as those of the late 'twenties, may have included only cow's milk.

[32] According to Nifontov (*Animal Husbandry* . . . . , pp. 172–73), the yearly averages were 1,007 kilograms in 1926–27, 992 kilograms in 1927–28, and 1,005 kilograms in 1928–29.

[33] *Socialist Agriculture USSR, 1938*, pp. 34 and 78.

The average for all sovkhozy was at most 1,250 kilograms.[34] Thus the sovkhozy could have raised the average yield of milk for all cows by not more than 10 kilograms. Since the average yield of all cows was about 70 kilograms above that in kolkhozy and only 10 kilograms are accounted for by the high yield in sovkhozy, the average yield of the cows owned individually also was higher than the average and quite substantially above that of the kolkhozy. This comes quite unexpectedly in view of the priority of the kolkhoz cows for the feed produced by the kolkhozy. Even though the superiority of the individual sector in milk yield per cow was probably to a certain extent due to regional factors, the data certainly do not testify to great achievements of collectivization.

The fact that the milk yield per kolkhoz cow was below the average and below that of the individual sector explains why the average yield of all cows in 1937 was not stated in the official yearbook from which the above milk yields were taken. The chance would not have been missed to emphasize an increase in average yield as compared with the pre-collectivization level, if such action would not have made it clear that the increase had nothing to do with collectivization.

For a long time only the partly preliminary data for 1938 in *Socialist Agriculture USSR, 1938* were available to indicate milk yield and output in the period from 1938 to 1940.[35] In spite of the change from excellent to very poor weather the milk yield of the kolkhozy according to those data was supposed to have increased from 1,027 to 1,100 kilograms and those of dairy-beef and sugar-beet sovkhozy from 1,458 and 1,802 to 1,788 and 2,096 respectively. The figures obviously implied that the upward trend in the milk yield in 1934–37 continued very strongly also in 1938 and made it probable that the yield of the socialized sector continued to rise strongly also in 1939 and 1940.

[34] Sovkhozy had 1,352,100 cows on Jan. 1, 1938 and produced 2,070,000 tons of milk in 1938; in that year the average yield in dairy-beef sovkhozy is supposed to have been 1,788 kilograms as against 1,458 kilograms in 1937; in sugar-beet sovkhozy, 2,096 kilograms as against 1,802.

[35] *Socialist Agriculture USSR, 1938*, pp. 73 and 78–79, while designating the figure for total output in 1938 as preliminary, gave the yields per cow in kolkhoz fermy and in two groups of sovkhozy in that year without this qualification.

While the writer seriously doubted the 1938 estimate, he did not dare to assume such a great overestimate as actually occurred. According to Demidov, vice-president of the Gosplan, the milk yield in kolkhoz fermy was only 1,017 kilograms in 1939.[36] While 1939 suffered somewhat from insufficient moisture, the year was substantially better than 1938. Demidov's figure for the kolkhoz milk output in 1939 definitely points to a 1938 yield in kolkhozy below 1,000 kilograms. It is furthermore a proof that the rising trend of milk yields in kolkhozy in 1937–39 was small, apparently not exceeding 2 percent per year. A statement by Kantyshev[37] indicates that the milk yields in sovkhozy in 1939 and 1940 were below those given in *Socialist Agriculture USSR, 1938* for 1938.

Equipped with this knowledge, one may try to form an idea of the milk production in 1937–40. If the weather conditions in 1937 had been normal the milk output would not have exceeded 24.6 million tons (the actual output minus 5 percent).[38] The milk output of 1938 may be tentatively estimated under the assumption of normal weather at 27.2 million tons (24.6 million tons plus 8.6 percent for the increase in the number of cows plus 2 percent for the rising trend).[39] In as bad a season as 1938 actually was, the milk output was probably at most 26 million tons. The assumed milk output of 27.2 million tons in 1938 (normal weather) is about 9 percent below the 1927–28 production.[40]

The number of cows increased by only one-half percent from 1938 to 1941 (Chart 37, p. 622). The moderate decline in the sovkhoz cow herds must have slightly depressed the average milk yield and the total output. The increase in kolkhoz cow herds must have had a similar effect. The rapid expansion of the cow herds in the nomadic areas likewise tended to reduce the average

[36] S. F. Demidov, *Development of Agriculture in Postwar Five-Year Period* (Moscow, 1946), p. 133.

[37] I. E. Kantyshev, *Sovkhozy under Conditions of the Great Patriotic War* (Moscow, 1946), p. 13.

[38] It was shown above that the meat output, which is less affected by the hay crop and pasture conditions than the milk output, was raised by the favorable weather conditions in 1937 to the extent of close to 5 percent.

[39] The milk yield in the individual sector is unlikely to have had any rising trend. The trend was still strong in sovkhozy, but they had little more than 5 percent of all cows.

[40] Nifontov's figure for 1927–28, which was 0.9 million tons below that of the Gosplan, was used for the comparison.

milk yield. All in all, the total milk output may have declined slightly in 1939 and 1940 from the figure here accepted for 1938 under the assumption of normal weather. But it is assumed here that under normal weather conditions it amounted to 27 million tons in both years.

Prewar distribution and consumption.—The situation in milk marketings and retention for consumption by producers is similar to that of other farm products. The proportion of marketed milk and dairy products in terms of milk was doubled from 1927–28 to 1937.[41] Since milk production declined in the meantime, and consumption by calves was reduced only in proportion to the drop in production, the milk remaining for the rural population was reduced by one-third (see also pp. 94–95).

Postwar.—The goal of 24.7 million cows for January 1, 1948[42] indicates perhaps 21 million cows on January 1, 1946 as against possibly 26.5 million in the present territory in 1940. Andreev in his February 1947 report said that according to the Central Office of Economic Accounting the milk yield averaged 945 kilograms in 1945. The prewar yield in the present territory may have been above 1,150 kilograms. The indicated decline in milk output is 30 percent.[43] This places milk among the farm products that suffered least from the war.

The 4th Plan does not reveal the number of cows scheduled for January 1, 1951. The Party resolution of February 1947 called for 27.2 million cows on January 1, 1949, as against a goal of 24.7 million for January 1, 1948. These rates indicate a goal for January 1, 1951 of perhaps 32 million cows. But the cattle number projected for January 1, 1951 does not imply more than possibly 29 million cows on the same date.

A huge increase of 67 percent in milk yield is specified for 1950 in the 4th Plan. Since the yield of 1945, according to Andreev, was 945 kilograms, the scheduled yield is not less than 1,578 kilograms and the indicated total planned production amounts to 45–47 million tons, or some 40 percent above the

[41] It increased from 15 to 31 percent of the total production. See *Socialist Agriculture USSR, 1938*, p. 74.

[42] Party resolution of February 1947.

[43] Allowance is made for the fact that the spring count normally shows more cows than the preceding winter count.

prewar level. This optimism is probably based on the expectation of abundant supplies of good hay. It nevertheless cannot be taken seriously. A restoration of the prewar milk output by 1950 or a slight excess over it is probably the most that can be expected.[44]

EGGS

Egg production in 1932 was about 40 percent of that in 1928. Government procurements in that year amounted to only 386 million eggs,[45] about 10 eggs for each urban person. In 1933, egg production reached its lowest point, at 31 percent of the 1928 output. All marketings in 1933 were estimated at 649 million eggs or a little more than 15 eggs per urban dweller.[46] The 1932 output level was approximately restored in 1934.

The 1937 output was not disclosed, but it must still have been small. The government succeeded in procuring 1.4 billion eggs, as against the marketings of 923 million in 1934[47] and of 4.3 billion in 1927–28. In 1937, egg production may still have lagged 30 percent behind the pre-collectivization level, and probably was not much more than 60 percent of the goal.[48]

In 1940 chickens numbered 183 million as against 199 million in 1927–28 (pp. 624–26). The pre-collectivization level of egg yield per chicken[49] would not have been difficult to exceed, and may indeed have been exceeded, but any significant gain would have been proclaimed.

One hundred and six large mechanized poultry sovkhozy increased the egg yield per hen from 60 in 1932 to 150 in 1939, but they had only 1.7 million head of all poultry in the latter year.[50] The poultry fermy of the kolkhozy also obtained yields far above the pre-collectivization average, in the years immediately preceding the Union's involvement in the war. While the average yield in all fermy was not disclosed, it was stated that,

[44] Nothing official can be found on the planned milk output in 1950.

[45] *Results of the Fulfillment of the 2d Five-Year Plan for the Development of the National Economy of the USSR*, Gosplan (Moscow, 1939), p. 103.

[46] *Ibid.*

[47] *National Economic Plan for 1935* (2d ed.), p. 662.

[48] The goal was 12.25 billion eggs "for consumption."

[49] The average for 1926–27 and 1927–28 was 52.7 eggs; for 1928–29 51.1.

[50] A. Dyakov, "The Organization of Poultry Fermy in Kolkhozy," *Socialist Agriculture*, August-September 1940, p. 81.

in 1939, 65 percent of them had yields of over 100 eggs per laying hen, and 24 percent obtained yields of over 140 eggs.[51] All fermy probably averaged well over 100 eggs per laying hen, but they had only 8.1 million head of all types of poultry on January 1, 1940.[52]

Thus the high-yielding chickens made up little more than 5 percent of the total; and even if they had averaged 120 eggs each, this could have increased the all-country average by perhaps only 4 eggs. The chickens of the peasants were always scavengers, but there was much less opportunity for scavenging after a large part of the farm activities had been transferred from the yard and barns of the peasants to those of the kolkhozy. Thus the output of eggs, like that of meat, may never have regained the pre-collectivization level.

WOOL AND HIDES

Since the livestock never were fully restored to their pre-collectivization numbers, the outturn of such products and by-products as wool and hides also did not regain that level. The output of wool in 1938 was established at 133,000 tons as against 177,800 tons in 1928.[53] The reported decline in wool production was smaller than the decline in sheep and camel numbers, because an increase in the yield of wool per sheep is supposed to have occurred. Owing to improved quality, the value of the wool declined even less than the tonnage. In 1938, 10.1 percent of the output consisted of fine wool, and 27.1 percent of semicoarse wool. Little of these types was produced before the collectivization drive.[54] Since the number of sheep continued to increase and the quality of the wool to improve after 1938, by 1940 the total value probably somewhat exceeded that of 1928.

TOTAL ANIMAL PRODUCTS

The value of the total production of animal products is analyzed in chapter xxviii. Chart 4 (p. 65) shows the relation,

[51] *Ibid.*, p. 82.

[52] *Ibid.*, p. 81.

[53] *Socialist Agriculture USSR, 1938*, p. 73, and Nifontov, *Animal Husbandry* . . . . , pp. 154–55.

[54] The pre-1914 situation was, in this respect, intermediate between 1928 and 1938; the sheep herds probably deteriorated in quality between 1914 and 1928 (see p. 501).

or rather the complete absence of any relation, between the goals and achievements. Far from attaining the substantial increases fixed by the various plans,[55] the total production of animal products, even in the best year between the start of the collectivization drive and the beginning of the war, was below the level of 1928. Any error in calculation affects only the degree of inferiority.

[55] The maximum variant of the 1st Plan called for an increase of 50.3 percent, the 2d Plan for 143.8 percent, and the 3d Plan for 100 percent.

PART V

OVER-ALL PRODUCTION AND INCOME

CHAPTER XXVIII

TOTAL PRODUCTION

THE INDEXES: SOVIET

The values of gross and net agricultural production, in prices of 1926–27, are used as indicators, measures, or indexes of agricultural production in the USSR, the value of net agricultural production being taken as the national income from agriculture.[1] The Soviet gross agricultural production is the sum of gross production of vegetable products and gross production of animal products. It is not used in this form in the United States. The income from agriculture as computed in the USSR also differs from gross farm income as computed in this country.[2] The volume of production available for sale and for consumption in the farm home, which is the standard index of agricultural production in the United States and some other countries, is not computed in the USSR.

Gross agricultural production.—When the 1st Plan was prepared, the Soviet Union was taking the first steps in working out such refined statistical concepts as indexes of gross and net agricultural production. The *1st Plan* did not enumerate all items included under gross agricultural production, but they were probably the same as given in two other publications of the Gosplan, one printed a few months before the *1st Plan* the other a few months after.[3]

The vegetable products included in the value of gross agricultural production, according to the enumeration in *Control Figures . . . . for 1928–29* are as follows: all grains; the

[1] Correspondingly, all value data in this chapter, unless otherwise noted, are in rubles at 1926–27 prices.

[2] On the computation of national income in the USSR, see Paul Studenski, "Methods of Estimating National Income in Soviet Russia," *Studies in Income and Wealth* (New York, 1946), VIII, 197–234.

[3] *Central Figures of the National Economy USSR for 1928–29*, pp. 476–77, and *Control Figures . . . . for 1929–30*, pp. 534–35. *Statistical Handbook USSR, 1928*, Central Statistical Board (Moscow, 1929), published almost simultaneously with the *1st Plan*, contained on pp. 274–81 about the same enumeration.

various technical crops; straw, chaff, and other residuals; wild hay; sown hay; and potatoes, vegetables, and fruits. The considered items of the livestock industry included meat, milk, poultry, eggs, silk, honey, hides, wool and other raw materials, manure, and the net change in livestock numbers.

It is obvious from the above enumeration that an attempt was made to include all products in the concept "gross agricultural production," whether they were final or intermediate. Such a composition of gross agricultural production naturally involves a great deal of duplication and the index cannot be regarded as a good measure of changes in agricultural production. But whatever the value of such a computation, if it is attempted it must be complete. However, owing to the infant stage of research in this line, important omissions can be observed in the Gosplan's composition of gross agricultural production.

While the value of harvested or saved feeds, including straw and chaff, was counted, so important an item as pasturage was overlooked. The animal products considered in the Gosplan's computation of gross production included manure, but not farm-produced power. Thus the major product of animal husbandry in the USSR at that time was not among the products considered.[4] Seed production and unfinished production were two minor items not included.[5]

A shortcoming of the evaluation of gross agricultural production and, for that matter, of income from agriculture, was that no provisions were made for waste, which of course is to a certain extent inevitable.

Although the concept of gross agricultural production as used in the USSR is not an ideal index, it would give reasonably good results if it were handled in the proper way—that is, if the items included, and the quantities and prices involved, were always clearly specified; and if all changes in procedure were

[4] Everyone seems to have been guilty of this omission at that time. In United States statistics, the cost of farm-produced draft power appeared for the first time in the WPA National Research Project (see R. G. Bressler, Jr. and J. A. Hopkins, *Trends in Size and Production of the Aggregate Farm Enterprise, 1909–36*, Report A-6, Philadelphia, July 1938). It is also included in the recently released indexes of gross farm production of the United States Department of Agriculture (see G. T. Barton and M. R. Cooper, *Farm Production in War and Peace*, U.S. Dept. Agr., December 1945).

[5] The author is indebted to E. W. Grove, of the Bureau of Agricultural Economics, U.S. Dept. Agr., for suggestions concerning this section.

plainly indicated and back figures were adjusted to make them comparable with those computed by the new procedure. But this was not the Soviet practice.

Soviet policy welcomes improvements in statistical methods that reveal present conditions in a better light than the past, but those which would have an opposite effect are taboo. The value of seed production and of unfinished production, two items which were believed to increase rapidly, were included in the computation of the value of gross agricultural production in the *2d Plan.*[6] The following amounts were involved (in million rubles):

Item	1932	Goal for 1937
Seed production	64	263
Unfinished production*	249	529

* Including "other vegetable production."

These two items probably were also included in the computation of the value of gross agricultural production in the *3d Plan* and *4th Plan*, but the computation of the *1st Plan* was never revised correspondingly.

The item farm-produced draft power, the value of which was cut almost in half between 1928 and 1932 and remained at a greatly reduced level thereafter, was never included in the computations of the value of gross agricultural production. Never added was the value of grass in pasture, which was curtailed considerably during the 'thirties by actual reduction of acreage through conversion to meadows and arable land, and by inadequate utilization incident to the vast reduction in livestock, especially in the areas of former nomadic and semi-nomadic agriculture.

The enumerated shortcomings were minor as compared with what has happened to the indexes since 1933, when the estimates for grain were changed from a barn to an on-the-root basis, a change that was subsequently extended to all other crops (see pp. 541–43, 546–48, and 728 ff.). The value of the unharvested portions of the crops was made part of the value of gross agricultural production and also of the income from agriculture. Soviet

[6] *2d Plan*, pp. 464–65.

statisticians are not permitted to make the value of gross agricultural production in the different years comparable, either by adding the value of the nonexisting portions of the crops to the estimates of earlier years or, better, by excluding them from the estimates of later years.

Before this discussion is concluded, some more details may be given of the material involved in the estimates of the value of crop production and of animal products. A few official estimates of the value of total crop production in 1927 and 1928 tabulated below (in million rubles) show the difficulties the analyst is faced with right from the start:

	1927	1928
Gosplan, 1928[a]	10,344	
Gosplan, *1st Plan*[b]	9,216	
Gosplan, 1929[c]	10,753	11,217
Central Statistical Board, Yearbook[d]	11,445	
Central Office of National Economic Accounting (Nifontov)[b]	....	8,918
National Income of the USSR[b]	....	9,400

[a] *Control Figures . . . . for 1928–29*, pp. 476–77.
[b] See Table 50.
[c] *Control Figures . . . . for 1929–30*, pp. 534–35.
[d] *Statistical Handbook USSR, 1928*, pp. 274–77.

It was apparently never explained why the Gosplan, in its estimate in the *1st Plan*, cut 1.1 billion rubles from the figure given a few months earlier, and then added 1.5 billion rubles for its estimate of a few months later. Nifontov's figure for 1928, on the other hand, was several hundred million below that of the *1st Plan*, if the fact is considered that the 1927 output was somewhat higher than that of 1928.

The series of values of crop production published in *Agriculture USSR, 1935* has the noteworthy feature that, with the exception of 1932, the value for each year was higher than for its predecessor (Table 50). Moreover, the 1932 figure was practically the same as that of 1931. No value of gross production was ever published for 1936, since it was a very poor crop year. However, one publication[7] gave this value for the collectivized output of the kolkhozy and, surprising as it may seem, the value

[7] *Kolkhozy in the 2d Stalin Five-Year Period*, Gosplan (Moscow, 1939), p. 81.

of vegetable products turned out to be almost 4 percent higher in 1936 than in 1935. This ascending trend of values to a large extent existed only "statistically."[8]

Unfortunately, among the crops included in its computation

TABLE 50.—VALUE OF GROSS CROP PRODUCTION, 1927–28 TO 1937, ACCORDING TO VARIOUS OFFICIAL SOURCES

(*Million 1926–27 rubles*)

Year	*1st Plan*[a]	Nifontov[b]	*Agriculture USSR 1935*[c]	*Socialist Agriculture USSR 1938*	*Socialist Construction USSR 1933–38*	*National Income of USSR*[d]
1927–28[e]	9,216	...	...	...	...	...
1928	...	8,918	...	...	...	9,400
1929	...	8,800	9,059	...	9,059	...
1930	...	9,700	9,602	...	...	...
1931	...	...	9,851	...	...	...
1932	...	...	9,779	9,779	...	9,779[f]
1933	...	...	11,054	...	11,051	...
1934	...	...	11,308	...	...	...
1935	...	....	12,278	...	...	...
1937	...	...	...	15,070	15,070	14,723

[a] *1st Plan*, II, Part 1, p. 326.

[b] *Animal Husbandry of the USSR in Figures*, p. xii.

[c] Page 221.

[d] *National Income of the USSR: Its Formation and Computation*, Academy of Sciences USSR, Institute of Economics (Moscow, 1939), not available to the writer. Here quoted from *Quarterly Bulletin of Soviet-Russian Economics*, March 1941, p. 114.

[e] October–September.

[f] Also in *2d Plan*, I, 464–65, and elsewhere.

for the *1st Plan* the Gosplan specified only grain, technical crops, and wild hay (Table 51). The values placed on the 1927 output of grain and technical crops—products with firmly established outputs and prices—were practically the same as in *Control Figures . . . . for 1928–29* (3,731 million rubles as against 3,739 million for grain; 911 million rubles as against 901 million for technical crops). The value of wild hay, however, was scaled down from 1,953 million rubles to 1,542 million. A sum of 3,032 million rubles remained in the *1st Plan* provisions for the nonspecified items; it had to cover the value of potatoes, vegetables, fruits, rotation hay, and straw, chaff, and other

[8] The share of the kolkhozy in peasant sowings increased only by 4.1 percent from 1935 to 1936. The reason the 1936 kolkhoz output exceeded that of 1935 was that the 1936 grain crop was overestimated considerably more than the 1935 crop (see p. 546).

residuals. The appraisals of these items by the same Gosplan were as follows (in million rubles):

Item	Estimate of 1928[a]	Estimate of 1929[b]
Potatoes	1,038	1,059
Vegetables	531	941
Fruits	(414)[c]	265
Rotation hay	386	394
Straw, chaff, and other by-products	1,381	1,612
Total	3,750	4,271

[a] *Control Figures . . . . for 1928–29*, pp. 476–77.
[b] *Control Figures . . . . for 1929–30*, pp. 534–35.
[c] Parentheses of the source, probably indicating uncertainty.

It is improbable that in setting the 1927–28 values in the *1st Plan* the Gosplan cut its 1928 estimate of potatoes or vegetables. The estimate of 531 million rubles for vegetables was anyway the smallest available and was boosted greatly by the same Gos-

TABLE 51.—VALUE OF GROSS CROP PRODUCTION BY MAJOR GROUPS, 1927–28 TO 1937, ACCORDING TO VARIOUS OFFICIAL SOURCES

(*Million 1926–27 rubles*)

Year	Total	Grain	Technical crops	Potatoes and vegetables	Fruits	Feed crops
	1st Plan, II, Part 2, p. 326					
1927–28	9,216	3,731	911	1,569[a]	414[a]	1,542[b]
	Agriculture USSR, 1935, p. 221					
1929	9,059	3,347	876	1,866	392	...
1930	9,602	3,741	1,059	2,231	342	...
1931	9,851	3,415	1,242	2,281	414	...
1932	9,779	3,461	1,092	2,292	387	1,994[c]
1933	11,054	4,490	1,147	2,569	372	...
1934	11,308	4,547	1,088	2,471	432	...
1935	12,278	4,780	1,370	2,687	...	...
	3d Plan, p. 68					
1937	15,069	6,352[d]	1,746	2,949	...	1,782[b]

[a] Not stated in *1st Plan*. Data from *Control Figures of the National Economy USSR for 1928–29*, Gosplan (Moscow, 1929), pp. 476–77.
[b] Wild hay.
[c] From *2d Plan*, I, 464–65, whose figures in general fully coincide with those of *Agriculture USSR, 1935* on such matters.
[d] Including straw and chaff.

plan the next year. The Gosplan may have cut off 100–150 million rubles from its evaluation of fruits. But the main cut must have been in the value of roughage, i.e., rotation hay, straw, chaff, and so on. Again no reason seems ever to have been given.

Unlike the *1st Plan*, the *2d Plan* gives a complete enumeration of the items of crop production; the individual items total 9,779 million rubles. For grains the value is stated with and without straw and chaff. The value of the straw and chaff in 1932 works out to the very small figure of 240 million rubles. On the other hand, a high figure of 1,994 million was inserted for the value of feed crops, probably all hay, roots, and silage crops.

The *3d Plan* again returned to the practice of the *1st Plan* of lumping several unspecified items together. Along with the total value of crop production in 1937 of 15,069 million rubles, the following items were specified (million rubles):

Grain (including straw and chaff)	6,352
Technical crops	1,746
Potatoes and vegetables	2,949
Feed crops	1,782
Total	12,829

The balance of 2,240 million rubles had to cover the value of fruits and may have been intended to cover the value of seed and unfinished production. Even assuming that fruits were estimated at the exaggerated figure of 600 million rubles, and that the value of seed and unfinished production in 1937 reached the goal of the *2d Plan* for that year (263 million and 529 million rubles respectively), there is a residual of 848 million rubles which cannot be accounted for or ignored (see p. 670, note 17).

As in the *2d Plan*, the *3d Plan* gave the value of grain including straw and chaff, but unlike the *2d Plan* it did not state the value of grain without straw and chaff.

The idea that totally lost portions of the crop available in the field prior to harvest might be included in the appraisal of total agricultural production is appalling, yet this is the standard

practice in the USSR. Of the years with biological yields, the value of grain was stated separately only for 1933–35 (see Table 51). These values even exceed those obtained by multiplying official output estimates for the individual grains in biological terms by the 1926–27 prices—by 143 million rubles for 1933, by 148 million for 1934, and by 346 million for 1935. The prices used were from *Control Figures . . . . for 1929–30*[8a] (see Table 55, p. 691). For 1937 the value of grain as officially given included the value of straw and chaff (Table 51). When the 1926–27 prices are applied to the biological grain crops of that year, the obtained figure is less than the official figure for the value of grain, straw, and chaff by 320 million rubles. The value given for the chaff and straw, though small, is in line with the 240-million-ruble estimate for the output of chaff and straw in 1932 given in the *2d Plan.* Any discrepancy would, in any case, be irrelevant because the itemized value of the official 1937 crop production in the *3d Plan* leaves 848 million rubles unaccounted for (see above, p. 663), and all items in the evaluation of the 1937 crop production which have to be regarded as representing the value of feed are, in their aggregate, even excessive (see below, p. 670).

The Gosplan's estimate of the value of animal products in 1927–28 in the *1st Plan* was 5.3 million rubles. The 1928 value should have been about the same. Yet in Nifontov's study the 1928 value was estimated at 6.0 billion rubles. As is obvious from the data in Table 52 (p. 666), this figure is in line with the estimate for 1929 in *Agriculture USSR, 1935* and *Socialist Construction USSR, 1933–38.* The 1928 figure from *National Income of the USSR* is also higher than that of the *1st Plan* for 1927–28, although not so high as Nifontov's.

The *1st Plan* stated the value of animal husbandry in 1927–28 in one figure. The details are found in *Control Figures . . . . for 1928–29* and *1929–30*, and in *Statistical Handbook USSR, 1928.* The *2d Plan* gave five items along with the total value of animal production. The *3d Plan* returned to the practice of the *1st Plan* of giving one figure for the value of animal products.

The value of all livestock (including poultry and bees) at

[8a] Prices of peas (not shown in Table 55) had to be applied to all dry legumes.

1926–27 prices was estimated at 9.0 billion rubles for the end of 1927–28.[9] During 1928–34, livestock herds (summer counts) were cut by 53.4 percent for horses, 39.9 percent for cattle, 33.1 percent for hogs, and 64.6 percent for sheep and goats (see Chart 37, p. 622). The lost livestock had a value of possibly 4 billion rubles. In the official computation of the value of animal production, on which national-income indexes are based, this immense loss appears as a gain of 1,248.1 million rubles. This certainly surprising statistical "achievement" was, of course, never clearly stated, but the figures below are implied in two tables published in an official journal and stated to be official:[10]

Year	Increase (+) or decrease (−) in value of livestock at 1926–27 prices (*million rubles*)
1929	+ 188.5
1930	− 55.2
1931	+ 104.8
1932	+ 107.8
1933	+ 169.4
1934	+ 732.8
Total	+1,248.1

Since these figures appear manipulated for all years for which they can be computed, there is no reason to assume that the value of the lost or added livestock was computed correctly for other years, specifically for 1937 which plays a great role in the analysis in this study. In view of the abundance of such "statistics," it is rather surprising that many American students continue to take Soviet statistics seriously.

An end was put to any probing by releasing the value of gross agricultural production in 1940 and the goal of the *4th Plan* for 1950 in single figures. Even the values of crop and animal production were not stated separately.

None of the estimates of the values of gross agricultural production in the first three Plans for the base years—1927–28,

[9] *Control Figures . . . . for 1929–30*, pp. 448–49.

[10] A. Bolgov, "Problems of Calculating Unfinished Production in Agriculture," *Planned Economy*, 1938, 7th issue, pp. 72–73. One of the tables was taken by Bolgov from *Socialist Construction USSR, 1935*, Gosplan (Moscow, 1935), p. 282; the other he obtained directly from the Central Office of National-Economic Accounting of the Gosplan.

1932, and 1937—has ever been officially revised. There is a great deal of logic in this. Indexes based on such things as "biological yields" or on figures showing big gains in livestock where losses actually occurred are better off untouched.

TABLE 52.—VALUE OF GROSS PRODUCTION OF ANIMAL PRODUCTS, 1927–28 TO 1937, ACCORDING TO VARIOUS OFFICIAL SOURCES*

(Million 1926–27 rubles)

Year	*1st Plan*[a]	Nifontov	*Agriculture USSR 1935*	*Socialist Agriculture USSR 1938*	*Socialist Construction USSR 1933–38*	*National Income of USSR*
1927–28[b]	5,300	...	...	...	...	...
1928	...	6,012	...	...	...	5,600
1929	...	5,712	5,686	...	5,686	...
1930	...	4,800	4,406	...	...	...
1931	...	...	4,093	...	...	...
1932	...	...	3,293	3,293	...	...
1933	...	...	2,962	...	2,962	...
1934	...	...	3,283	...	...	...
1935	...	...	3,903	...	...	...
1937	...	...	...	5,053	5,053	5,036

* See Table 50 for more information on sources.
[a] *1st Plan*, I, 133.
[b] October–September.

Income from agriculture.—Net agricultural production or income from agriculture was estimated for 1927–28 to 1935 annually and also for 1913 and a few years prior to 1927–28; after that the figure for 1937 is the only one available. While there were many changes in the estimates of intermediate years, the estimates for the base years of the Five-Year Plans, 1927–28, 1932, and 1937, namely 8.9, 8.4, and 14.9 billion rubles respectively, were never changed. The estimates of total national income in those years also remained the same.

Income from agriculture is determined by deducting "production expenses" from the value of gross agricultural production.[11] "Production expenses" consisted of seed, feed, fertilizer, and depreciation, according to the source. Fuel was among the materials not mentioned—probably by oversight; the value involved may have been deducted nevertheless. The *Dictionary-*

[11] *Control Figures . . . . for 1928–29*, p. 441.

Handbook on Social-Economic Statistics[12] describes the method of computing the income from agriculture in greater detail. Among other things, it mentions the cost of materials as subject to deduction. But in substance the regulations of the *Dictionary* do not differ from those of *Control Figures.*

Income from agriculture, derived as it is from the value of gross production, naturally reflects all shortcomings of the latter index. The list of items classified as subject to deduction in both the *1st Plan* and the *Dictionary* does not mention the value of products spoiled, wasted, and otherwise lost. When the statistical exaggerations of gross production started in the early 'thirties, they were fully reflected in the income computations. No official source mentions that the difference between official estimates in biological terms and the barn crop has to be deducted. Moreover, the analysis of the deductions below (pp. 676–79) leaves no doubt that nothing is ever deducted. Actually, the exaggerations of gross agricultural production are magnified when fully transferred into the smaller income from agriculture. An exaggeration of 25 percent in the grain crop, used in computing the value of gross agricultural production, rises to almost 50 percent after deductions for seed and feed have been made for the determination of income.

Except for certain data in *Control Figures . . . . for 1928–29* and *1929–30*, the detailed calculations involved in converting the value of gross agricultural production to income from agriculture were apparently never published—certainly a great handicap for the analyst.

Production-for-sale-and-consumption index.—While it is very important to ascertain the income from agriculture, the most significant measure from many points of view, and certainly the basic one for analysis of agriculture, is the volume of goods produced in agriculture for use outside agriculture proper. This index comprises the products sold off the farm and those consumed in the farm household. It is the Soviet value of gross agricultural production corrected for duplications by elimination of such items as seed, feed, and manure.[13] A further deduction

[12] Gosplan (Moscow, 1944), pp. 108–09.

[13] It would also be advisable to eliminate waste, if it has not been eliminated previously.

of the cost of materials of nonagricultural origin, and depreciation, leads to the Soviet concept of income from agriculture.

GROSS PRODUCTION: COMPUTED

The agricultural output of 1927–28, the base year of the 1st Plan Period, and that of 1928 are so close that for practical purposes they may be considered identical, though the 1927–28 figure comprised the crops of 1927 and animal production of the crop year 1927–28, while the figure for 1928 covered crops and animal production of that calendar year. Official statistics use the data for the two years interchangeably; in the following discussion, where the date 1928 is used the figures to which it refers may be understood to apply to 1927–28 as well.

The following analysis in the first place attempts to make the estimates for 1932 and 1937 comparable with those of 1928. In addition, detailed computations are made for 1938—not for the actual 1938, a very poor crop year, but for a 1938 year assumed to have had normal weather.[14] More importance must be attached to the estimate for 1938 thus computed than to the figure for 1937, a year of exceptionally favorable weather. Indeed, the unadjusted returns for 1937 should not be compared with those of 1927, 1928, or 1932; all of these were average or slightly below average in weather, although they are here treated as average years. Finally, estimates for 1940 are made (also under the assumption of normal weather), but these are less reliable than the estimates for other years.

Crops.—Table 53 summarizes the writer's estimates of the value of crop production in 1928, 1932, and 1938.

The estimate of 73.1 million tons—the official figure for both the 1927 and 1928 grain crop—is used in this table;[15] the estimates for the grain crops of 1932, 1937, and 1938 were made in accordance with the findings on pages 543–46 and 548–49.

It is probable that in official computations high prices were put on technical crops of recent introduction.[16] The official esti-

[14] Actual yields and outputs were replaced by trend values for this computation.

[15] This is slightly higher than the figure of the Central Statistical Board.

[16] See Appendix Note C on the system of putting very high 1926–27 prices on the items not produced until after that year.

mates of values of the technical crops are nevertheless used here because a thorough check is difficult. The output of these crops in 1938 (with normal weather) is estimated at about 5 percent below the official estimate for 1937.

TABLE 53.—GROSS CROP PRODUCTION, 1928, 1932, 1937, AND 1938*

Crop	1927–28 or 1928	1932	1937	1938[a]
	Value (*million rubles at 1926–27 prices*)			
Total production	*9,497*	*8,726*	*13,371*	*12,144*
All grain	3,693	3,357	4,975	4,377
Wheat[b]	1,291	1,163	2,203	1,836
Other[b]	2,402	1,194	2,772	2,541
Potatoes[b]	1,062	1,000	1,650	1,500
Technical crops	911	1,092	1,746	1,640
Vegetables	731	1,077	1,200	1,077
Fruits	400	300	500	450
Feed[c]	2,600	1,600	2,800	2,600
Seed and unfinished production	100	300	500	500
	Quantity (*million tons*)			
All grain	73.1	66.5	96	85
Wheat	21.1	19.0	36	30
Other	52.0	47.5	60	55
Potatoes	42.5	40	65	60

* See text for sources and comments.

[a] Normal weather conditions assumed for 1938.

[b] The 1926–27 prices on which the values are based are as follows (in rubles per ton): wheat, 61.2; other grain, 46.2; potatoes, 25.0. The potato price is that assumed by the Gosplan; the grain prices are close to those of the Gosplan (see p. 664).

[c] Feed other than grain, potatoes, and vegetables.

Official estimates for the potato crops in 1928 and 1937 were used. The crops of 1932 and 1938 were estimated at 40 million and 60 million tons respectively. The output of vegetables was estimated at 731 million rubles for 1928, 1,077 million rubles for 1932 and 1938, and 1,200 million rubles for 1937 (pp. 599–602). The fruit output is estimated at 400 million rubles in 1928, 300 million in 1932, 500 million in 1937, and 450 million in 1938. Seed production and unfinished production were arbitrarily assumed to have amounted to 100 million rubles in 1928, 300 million in 1932, and 500 million in both 1937 and 1938.

It is unfortunately not absolutely certain what value was put on roughage in the Plans. The following figures (in million rubles) are the best that can be offered:[17]

1928	2,591
1932	2,234
1937	2,950

The sum of 48 million rubles must be added to the figures for 1928 for the value of feed roots (see p. 600).

The official figure of 2,234 million rubles as the value of the 1932 roughage, only 15 percent less than that of 1928, is obviously unacceptable, in view of the extreme deterioration of the feed situation in the early 'thirties. The value of the 1937 feed output also seems exaggerated relative to that of 1928. The value of harvested or saved feedstuffs other than grain, potatoes, and food vegetables used for feed, is here more or less arbitrarily estimated as follows (in billion rubles):

1928	2.6	1937	2.8
1932	1.6	1938	2.6

The value of gross crop production in 1927–28 or 1928 obtained as the result of all this estimating exceeds the *1st Plan's* estimate for 1927–28 by 0.3 billion rubles, but it is below the Gosplan's estimates for 1927–28 in *Control Figures . . . . for 1928–29* and *Control Figures . . . . for 1929–30* by 0.8 billion and 1.2 billion rubles respectively, and differs little from the estimate in *National Income of the USSR*. It is even more important that the computations for the other years were made for each item so that they would agree with that for the initial year, i.e., 1927–28 or 1928.

Gross production of crops in 1932 appears to have been about 8 percent less than in 1928, rather than 7 percent higher, as indicated by official data; but even the writer's computation

[17] The 1932 figure is official. The 1928 figure is obtained by deducting from the *1st Plan* figure for the 1927 value of crop production the estimates of the same source for grain and technical crops, and the estimates of *Control Figures . . . . for 1928–29* for potatoes, vegetables, and fruits. The figure for 1937 is the sum of the value of feed production as given in *3d Plan* (1,782 million rubles), the 320 million rubles for straw and chaff assumed to be implied in the official value of grain including straw and chaff, and the 848 million rubles unaccounted for (see above, p. 663). The addition of this last item is arbitrary, but it cannot be ignored and its inclusion with roughage seems less questionable than with any other group of crops.

may not fully reflect the not inconsiderable decline that undoubtedly occurred in the early 'thirties.

The 1937 gross production of vegetable products, officially reported at about 64 percent above 1927, was actually only slightly more than 40 percent higher. The 1938 production, with the effect of unfavorable weather eliminated, exceeded that of 1928 by less than 30 percent.

Taking into consideration that the total cropped plowland declined slightly in 1939 and 1940, and that there was no shift to crops with large returns per hectare, it is unlikely that any measurable increase in output occurred between 1938 and the Union's entrance into World War II. To be on the safe side, however, an increase by 1.5 percent per year is assumed, the estimate for 1940 being made under the assumption of normal weather.

Animal products.—The official figures for the value of animal products are used here for those years for which they are available, in spite of the disclosed great inaccuracies in the computations of the losses from or additions to the livestock herds (see pp. 664–65). For 1928, Nifontov's estimate of 6.0 billion rubles is accepted. On the basis of these data, production of animal products in 1932 was slightly more than half that of 1928, and in 1933 it was less than half. The expansion in the next four years averaged slightly more than 500 million rubles per year. The 1937 production of animal products was 16 percent below that of 1928.

The 1937 crop season was exceptionally favorable, and the rehabilitation of productive livestock from the great decline of the early 'thirties was essentially concluded in that year. Cattle and hogs indeed started to decline again (page 626). Hence the further increase in gross production of animal husbandry, if any, must have been small, especially in view of the new policy of discouraging the increase in the livestock of the kolkhoz members.

Meat production, with the meat-equivalent of the changes in herds considered, declined by about 8 percent from 1937 to 1938 (pp. 645–46). The milk output in the poor-weather year 1938 is unlikely to have exceeded that in the excellent-weather year 1937. Though definite evidence is lacking, the residual deficiency

in 1938 production as compared with that of 1937 may have been offset by increases in the output of poultry, eggs, wool, hides, and skins. But the total value of animal products is not likely to have been measurably higher in 1938 than in 1937. In the computation for 1938, based on normal weather, the value of animal production is assumed to have been 5.3 billion rubles—about 5 percent above that of 1937 but more than 10 percent below 1928.

The analysis on pages 650–51 indicates that milk output in 1939 and 1940 remained at about the level it would have reached in 1938 if the weather had been normal in the latter year. The value of the output of principal meats is more likely than not to have declined from 1938 (normal weather assumed) to 1940, along with the curtailment of the herds. Increases in output of eggs, poultry meat, and wool could not have boosted the total value of animal products noticeably. The total value of animal products in 1940 is here taken at 5.4 billion rubles at 1926–27 prices.

The output of animal products certainly did not reach the pre-collectivization level in 1940. A short review of the findings in chapter xxvii in support of this conclusion may be useful. The meat[18] output capacity is likely to have been about 3,000,000 tons in 1940 as against 3,850,000 tons in 1927–28; the difference in value was somewhat smaller, owing to the increased proportion of the more valuable pork and hog fat in 1940. Milk output was about 10 percent below the pre-collectivization level in 1940. There was somewhat more poultry and rabbit meat, and wool (by value), but fewer skins and less manure. The egg output, too, may not have regained the pre-collectivization level. Thus, 5.4 billion as the value of animal production in 1940 appears broadly consistent with the 6.0 billion of 1928. This relationship may still hold if the relationship in meat output was less unfavorable for 1940 than is assumed here.

The official values of the output of animal products in 1928 through 1937 used here included an appraisal of qualitative improvements in the herds, undoubtedly at greatly exaggerated

[18] Principal meats, including hog fat (carcass weight).

rates.[19] For lack of evidence, these improvements were not considered in the appraisal of the value of animal production in 1938–40. The omission could not have affected the conclusions significantly.

Farm-produced draft power was entirely excluded from the analysis, though its inclusion would have changed the results substantially. In terms of animal units based on feed use, horses represented more than 40 percent of the available livestock in June 1928.[20] The value of the horsepower was less than that, because relatively less labor is needed for the care of horses than for the other domestic animals. But this reduction is largely offset by the value of the utilized power of the oxen. Three billion rubles, or one-third the value of all animal products (with this item included) in 1928, seems to be a reasonable estimate of the value of farm-produced power in that year.[21] Since the amount of farm-produced power was cut to almost half between 1928 and 1938, the inclusion of its value in the total value of all animal products would enhance the decline of the latter between 1928 and 1938 from 12 percent to about 25 percent.

Total.—The computations of the value of gross agricultural production yield the following results (in billion rubles):

Year	Weather	Vegetable products	Animal products	Total
1927–28 or 1928	Almost normal	9.5	6.0	15.5
1932	Almost normal	8.7	3.3	12.0
1937	Excellent	13.4	5.1	18.4[a]
1938	Normal assumed	12.1	5.3	17.4
1940	Normal assumed	12.4	5.4	17.8

[a] Computed from unrounded figures.

Total gross agricultural production declined about 20 percent from 1928 to 1932, instead of by the officially stated 14

[19] The consideration of this factor—even at greatly exaggerated rates—can, of course, account for only a fraction of the huge difference between approximtely 4 billion rubles lost through reduction in livestock during 1929–34 and the officially calculated gain of 1.2 billion rubles in those years (see pp. 664–65).

[20] Computed by using the coefficients given in *Dictionary-Handbook on Social-Economic Statistics*, p. 91. Only the major types of livestock—horses, cattle, hogs, and sheep and goats—were considered in the computation.

[21] This proportion is only slightly larger than that estimated for the United States in 1920 by Barton and Cooper (*op. cit.*, p. 28), although the production of animal products other than draft power is relatively much higher in the United States than the USSR.

percent. After 1932, gross agricultural production rose to such an extent that with normal weather, the 1928 level would have been exceeded by about 12 percent in 1938[22] and by about 15 percent in 1940. As elsewhere in this study, the computation for 1940, it should be noted, pertains to the pre-1939 territory.

According to the above estimates, the gross agricultural production in 1940 (normal weather assumed) was 3 percent below that in the favorable year 1937. N. A. Voznesenskii, however, in his speech to the Council of Soviets in March 1946, introducing the 4th Plan, gave a relation between gross-production figures in 1937 and 1940 which implied an increase of 15.7 percent in the period, although weather conditions in 1940 he described as unfavorable. No hint was given as to how these data were arrived at. Voznesenskii's figure for 1940 undoubtedly pertains to a greater territory than that of 1939, but there is no certainty that all 1939 and 1940 acquisitions were included. The enlargement of the territory can explain only part of the large discrepancy.

The goal of the 4th Plan for 1950 is fantastic. The Plan calls for an output worth 29.6 billion rubles, 47 percent more than the officially computed output in the old territory in 1937. The 1937 gross agricultural production of all the territory now included in the USSR probably did not exceed that of the prewar territory by more than 20 to 25 percent. Hence the plan provides for an increase of about 20 percent over the prewar level. Neither the old nor the new territory can possibly regain the prewar level by 1950. The 1950 goal is less extreme compared with the official estimates for 1940 if the latter pertained to the old territory, but in such a case the 1940 estimate itself was an even greater exaggeration than it is here assumed to have been.

PRODUCTION-FOR-SALE-AND-CONSUMPTION INDEX: COMPUTED

As in the case of his other computations, the writer does not pretend to have computed exactly the deductions needed to convert the gross-agricultural-production index to the index of "volume available for sale and for consumption in the farm home." All he can hope to have achieved is a fair comparability among

[22] The increase in 1928–38 would have amounted to only a few percent if the value of the use of pastures and of farm-produced power were considered.

the data for the four years, 1928, 1932, 1937, and 1938, for which this computation is attempted.

So far as grain is concerned, the analysis here is based on the actual or barn crops here computed, but otherwise waste and loss of agricultural products were not deducted, and thus are part of the volume available for sale and consumption in the farm home, and, consequently, of the income from agriculture. On the other hand, the total value of harvested and saved roughage had been deducted with the value of other feed, although part of it was used for purposes other than farm production and thus constituted part of the volume available for sale and consumption in the farm home. Some details on methods of computing deductions from the value of gross agricultural production are found in Appendix Note N.

As computed there, the deductions from the value of gross agricultural production needed to arrive at the volume available for sale and for consumption in the farm home are as follows (in million rubles):

Year	Vegetable products	Animal products	Total
1927–28 or 1928	5,051	428	5,479
1932	3,771	259	4,030
1937	5,903	343	6,246
1938	5,601	358	5,959

The 1938 deductions may also be applicable to 1940.

The difference between the 1928 and 1938 total deductions is roughly the same as the difference between the estimates for those years of seed production and unfinished production (see Table 53, p. 669). With those items eliminated, the balance represents chiefly feed. It may seem inconsistent, at first glance, that, in spite of the substantial decline in all livestock on feed, this balance for 1938 (5,101 million) should have exceeded the corresponding figure for 1928 (4,951 million). But this is not necessarily the result of errors in computing the deductions. Pastures are not considered in Soviet computations of gross production, and the amount of grass utilized on pastures declined and the deficiency had to be made up by feed subject to deduction. The amount of saved chaff declined and the pro-

portion of saved straw also probably had become less. Rotation hay is overvalued in 1926–27 prices relative to wild hay. The waste of feed, common in large-scale farming and especially pronounced in socialized farming, was a contributing factor.

When the needed deductions are made, the volume available for sale and for consumption in the farm home appears as follows (in billion rubles):

Year	Vegetable products	Animal products	Total
1927–28 or 1928	4.4	5.6	10.0
1932	5.0	3.0	8.0
1937	7.5	4.7	12.2
1938	6.5	4.9	11.5[a]
1940	6.8	5.0	11.8

[a] Computed from unrounded figures.

INCOME FROM AGRICULTURE: COMPUTED

Deductions from the value of products available for sale and for consumption in the farm home.—The income from agriculture is obtained by deducting depreciation charges and the value of materials of non-farm origin used in farming from the value of the products available for sale and for consumption in the farm home. The computation of these deductions for the years 1928, 1932, and 1938 is presented in some detail in Appendix Note O. For the 1937 and 1940 estimates, respectively, the 1938 figure is reduced 8 percent and increased 5 percent.

In computing the depreciation charges, there would be a certain degree of justification in using the official data on the value of the investment in agriculture and applying to them the high depreciation rates needed in view of the heavy utilization of each machine in the Soviet socialized agriculture and the manner in which they are abused by inexperienced and careless operators. If, in a similar way, the official values of the spare parts were inserted, the expenditure on depreciation and spare parts in 1938 would be so huge that the income from agriculture after ten years of collectivization would turn out to be considerably smaller than it was before collectivization.

The writer did not choose this easy way. He preferred rather to do his best to determine the real costs. Indeed, he may have

gone too far in cutting down the greatly overestimated investments in agriculture (Appendix Note B). Furthermore, the depreciation rates, established by the Gosplan for the private sector and applied here to part of the investment of the socialized sector as well, are certainly too low for the latter. Construction, for example, is poorly done, farm buildings being roofed almost exclusively with tar paper.[23]

The deductions for depreciation and outlays on non-agricultural commodities, needed to arrive at the income from agriculture, are as follows (in billion rubles):[24]

1927–28 or 1928	0.8	1932	1.0
		1938	2.1

While the determination of some of the individual items was necessarily rather arbitrary, the increase indicated in the above tabulation seems reasonable in view of the great expansion of mechanization and in the use of commercial fertilizer, and similar changes that occurred in Soviet agriculture during the period. All of these involved additional outlays for non-farm products.

Total deductions from the value of gross agricultural production.—By adding the two types of deductions computed above, the total deductions are obtained that are needed to bring the value of gross agricultural production down to the income from agriculture. These total deductions, in one figure, are the only official data available. Even they are rarely, if ever, stated explicitly, but must be computed by deducting the official income from agriculture from the official value of gross production (Table 54).

As may be observed from the table, the computed total deductions for 1928 are about 10 percent larger than the official ones. This small difference may be partly due to the deductions of the value of all harvested and saved roughage instead of that used in farming. The same was done, however, for all years. It is relevant to the analysis that the excess of the here-computed deductions over the official ones is smaller for 1932 than for 1928. While no computation of deductions was attempted for 1935,

[23] Buildings of the sovkhozy, MTS, and kolkhozy. Peasant huts are covered with local materials, mostly straw, as they always have been.

[24] See Appendix Note M.

they probably would have exceeded the official deductions for 1935 by about the same amount as the deductions computed here for 1932 exceeded the official ones for this year.

TABLE 54.—DEDUCTIONS FROM VALUE OF GROSS AGRICULTURAL PRODUCTION FOR CALCULATION OF INCOME FROM AGRICULTURE, OFFICIAL AND ESTIMATED, FOR SPECIFIED YEARS AND GOALS OF FIRST THREE PLANS*

Year	Official		Estimated	
	Billion rubles	Percent of gross production	Billion rubles	Percent of gross production
1927–28 or 1928	5.7[a]	38	6.3	40
Goal of 1st Plan for 1932–33				
Basic	8.2	40	...	..
Maximum	8.8	39	...	..
1932	4.7	36	5.0	42
Goal of 2d Plan for 1937	8.6	33	...	..
1937	5.2	26	8.2	44
1938[b]	...	..	8.0	46
1940[b]	...	..	8.1	45
Goal of 3d Plan for 1942	7.1	23	...	..

* Official figures as implied in data for Chart 4. For writer's estimates, see text.

[a] The *1st Plan* (I, 133) gave it as 5.6 billion for 1927–28, but it was 5,666 million according to *National Income of the USSR* (see note *d*, Table 50).

[b] Normal weather assumed.

But the similarity between the official and computed total deductions ends with 1935. The official deductions *declined* 400 million rubles from 1935 to 1937[25] in the face of the large increase in the use of feed and commercial fertilizer, as well as lubricants and fuel for the greater numbers of farm machinery and tractors. Actually, however, these additions should have *raised* the 1937 deductions more than one billion rubles above the level of 1935. The officially computed 1937 national income from agriculture was exaggerated by close to two billion rubles owing to inadequate deductions alone.

The deductions as officially computed are a good index of the deterioration of Soviet statistics. The 1st Plan, which provided for little mechanization, expected that a gross production of 20.7

[25] This is the figure implied in the preliminary data in *Socialist Construction USSR, 1936*, pp. xxxii and 232–33 in conjunction with those used in Chart 4. Data used by S. N. Prokopovicz, *Russlands Volkswirtschaft unter den Sowjets* (Zürich and New York, 1944), p. 358 imply a decline by 700 million rubles.

billion rubles (basic variant) or 22.6 billion (maximum variant) in 1932–33 would involve expenditures for seed, feed, non-agricultural materials, and depreciation to the extent of 8.2 or 8.8 billion rubles respectively. The 2d Plan, allowing for several times as much mechanization as the 1st Plan, and greater output of animal products, expected about the same deductions (8.6 billion rubles) from the considerably enlarged gross production of 26.2 billion rubles in 1937. The 3d Plan stipulated an even greater gross production in 1942 (30.5 billion rubles), but allowed for smaller deductions (7.1 billion rubles) than the other Plans. The "actual" deductions for 1937 were reported as less than in 1928, in spite of an increase in gross production of one-third and the great rise in the outlay on non-agricultural products.

Crop production leans more and more heavily upon the input of non-agricultural labor, devoted to the production of such items as machinery, fuel, and fertilizer, deductible in the computation of income from agriculture. Expanded animal production is increasingly dependent on the use of feed subject to deduction, rather than on pasture, the value of the use of which is not deductible in Soviet statistics. Hence the proportion of the gross production represented by total deductions must increase gradually. This is actually found in the correct computation of the 1st Plan, which expected that total deductions would increase from 38 percent of the gross production in 1927–28 to 39 or 40 percent in 1932–33. The gradual rise in the percentage may also be observed in the writer's computations, from 40 in 1928 to 46 and 45 in 1938 and 1940. However, the total deductions fixed as the goal of the 2d Plan for 1937 made up a smaller percentage of the gross production than was the case with the official estimate for 1928 (33 percent as against 38). The proportion again declined greatly in the official computation of the actual deductions for 1937—to 26 percent. According to the 3d Plan it would have been only 23 percent in 1942, or little more than half that of 1928—a miracle of using machinery and fuel without cost, and of raising livestock without feed.

Income from agriculture: computed.—The following approximate figures emerge as the income from agriculture after the

writer's computed total deductions are subtracted from his computed values of gross agricultural production (in billion rubles):

1927–28 or 1928	9.2	1937	10.3
1932	7.0	1938	9.4
		1940	9.7

Thus the income from agriculture declined from 1928 to 1932 by more than 20 percent. In 1938 it would have negligibly exceeded the 1928 level if weather had been normal. The increase from 1928 to 1937 was equivalent to little more than 10 percent as against the officially computed jump of 57.8 percent. The writer, however, is confident that his computation is correct within a few percent, and that a larger increase than the one here computed is no more likely to have occurred than a smaller one.

ADDENDUM

Certain changes in the computations of the indexes discussed in this chapter, which could not be incorporated in the main body of the study, seem to be desirable. Fortunately, only minor items are involved and the final findings differ negligibly from the original ones.

Seed production and unfinished production.—The great value assessed to unfinished production in the 2d Plan (see p. 659; the item is almost exclusively composed of the cost of fall plowing, the care of fallow land, and the fall seeding of grain and the seeding of perennial grass) misled the writer to believe the item to be a gross item. According to the instruction for the preparation of the 1937 plan, however, the item is equivalent to the *difference* in outlay on unfinished crop production in neighboring years.[26] The error affects the computed value of gross agricultural production and of the income from agriculture; the volume available for sale and for consumption in the farm home remains untouched.

The value of seed production, lumped in this study with unfinished production, must first be separated. No reliable data are available on the net value of seed production: i.e., the value of selected seed minus the value of straight-run grain or other seed or fruit used for seeding purposes in the years involved. If it is assumed to have been 50 million rubles in 1932 (instead

[26] A. Bolgov, *op. cit.*, p. 69.

of 64 million rubles—the official estimate), reasonable estimates for 1928, 1937, 1938, and 1940 seem to be 25, 100, 120, and 120 million rubles respectively. No great errors are implied if, in computing the volume available for sale, etc. and the income from agriculture, the value of seed production is deducted as expense in the same rather than the next year.

The change in the value of unfinished production from 1927 to 1928 may probably be ignored. Unfinished production declined in 1932, instead of increasing to the extent of 249 million rubles as per official statistics. Acreage sown to winter grain and plowed fallow were reduced by 1.7 and 2.1 million hectares respectively, while fall plowing for spring crops fell by 11.1 million hectares. Acreage in perennial grass also was on the decline.[27] The decline in value of unfinished production in 1932 may be estimated at 100 million rubles.

All components of unfinished production showed expansion in 1937 and the value of the latter is here supposed to have exceeded that in 1936 by 200 million rubles. Fall plowing declined after 1937, but with normal weather conditions the decline might not have occurred and there would have been a further moderate increase in unfinished production which is here estimated at 50 million rubles. The value of unfinished production in 1940 was almost certainly below that of 1939 but the decline, if any, is here neglected.

Following are the old and revised estimates of seed production and unfinished production (in million rubles at 1926–27 prices):

Year	Old estimate for both items	New estimates		
		Seed production	Unfinished producion	Total
1928	100	25	0	25
1932	300	50	−100	−50
1937	500	100	200	300
1938	500	120	50	170
1940	500	120	0	120

The values of seed production are added in computing gross agricultural production and again subtracted in computing the two other indexes. The values of unfinished production are sub-

[27] *Socialist Agriculture, 1935*, pp. 239, 249, and 486.

tracted only in the computation of the volume available for sale and for consumption in the farm home.

Depreciation of buildings and equipment for processing.—This item (Appendix Note O) was included as an item of expense to be deducted in the computation of income from agriculture, because it was so treated in a similar computation of the 1st Plan and the proceeds from the processing are part of the kolkhoz income. However, most of this processing is not strictly agricultural, and it is probably best to drop the whole item altogether.

Motor fuel and lubricants.—Data which came to the attention of the writer too late leave no doubt that the estimate of 5.5 million tons of fuel and lubricants as used in agriculture in 1938 is too low. In 1939 the plan of the Commissariat of Agriculture called for 7 million tons to meet the needs of its establishments, and this quantity probably was not intended to cover the needs of the sovkhozy, which are under other commissariats, mainly the Commissariat of Sovkhozy. According to S. Matskevich, agriculture used 7 million tons of motor fuel in 1940.[28] The utilization in 1938 was at least 6.5 million tons.

The results.—The volume available for sale and for consumption in the farm home remains unchanged by the revisions. The old and new estimates of gross agricultural production and income from agriculture are as follows (in million rubles):

	Gross agricultural production		Income from agriculture	
Year	Old	New	Old	New
1928	15.5	15.4	9.2	9.2
1932	12.0	11.7	7.0	6.9
1937	18.4	18.2	10.3	10.5
1938	17.4	17.1	9.4	9.5
1940	17.8	17.4	9.7	9.7

Thus for 1928–38, the most important period covered in this study, the increase in gross production appears less by about 2 percent of the total than in the original computation, while the increase in income from agriculture seems to have been larger by 1 percent. All these changes obviously are within the range of probable error of the totals.

[28] "Power Balance in Soviet Agriculture," *Planned Economy*, December 1940, p. 64.

CHAPTER XXIX

DISTRIBUTION OF KOLKHOZ OUTPUT AND KOLKHOZNIK INCOMES

Analysis of the receipts and outlays of the kolkhozy is undertaken primarily to ascertain the receipts of the kolkhozniki and is therefore rather sketchy. The subsequent appraisal of the incomes of the kolkhozniki, that is to say, of almost the entire rural population and about half the total population, is necessarily crude. In appraising the receipts of the kolkhozniki from their kolkhozy a number of minor items were neglected, such as the use of kolkhoz horses and the cultural services of the kolkhozy.[1] On the other hand the tax implied in the charge for grinding the kolkhozniki's grain (see page 373) was not deducted. Furthermore, errors in appraising the items considered were inevitable. Major errors, it is hoped, were avoided. The respective claims are so vastly exaggerated that omission of minor items and minor errors are irrelevant by comparison.

RECEIPTS AND OUTLAYS OF THE KOLKHOZY

Part of their produce the kolkhozy deliver to the government on obligatory deliveries and kontraktatsiya. They turn over another portion to the MTS in payment for services. They sell additional quantities to the government and co-operatives and in kolkhoz markets at widely varying prices. A portion is used for productive purposes—seed, feed for collectivized livestock, and food for workers for which some of the workers pay. The kolkhoz uses small quantities of its produce for children's nurseries, invalids, and the like. The small balance is distributed among the kolkhozniki on trudodni.

The cash transactions of the kolkhozy are relatively unim-

[1] In the kolkhozy investigated in 1937, 3.1 percent of the trudodni were expended on cultural services (Table 32, p. 423). As to the other services, a discussion by M. Nesmii ("Incomes of Kolkhozy and Kolkhozniki," *Planned Economy*, 1938, 9th issue, p. 89) indicates that the kolkhozy are providing these services for payment.

portant, because most of the marketed products go to the state at low or token prices. Owing to the low purchasing power of the money, it is also of minor significance that the kolkhozniki get a relatively large proportion of the cash receipts of the kolkhozy.

Disposition of the produce.—The itemized disposition of kolkhoz grain supplies in 1937–39 is given in Table 60, p. 738. The share of the kolkhozniki in the three years amounted to only 35.7, 26.9, and 22.9 percent of the total distributions, which were practically equivalent to the crops. Of the other kolkhoz crops, the following incomplete data on disposition are available for sunflower seed, sugar beets, and cotton in 1938 (in percent of the crops):[2]

Disposition	Sunflower seed	Sugar beets	Cotton irrigated	Cotton unirrigated
Obligatory deliveries or kontraktatsiya	38.7	82	81	90.1
Payment to MTS	16	17.8	17.5	5.0
Sales	14.3	none	none	none
On trudodni	20.2			

Total kolkhoz marketings and obligatory deliveries (which are included in marketings) of certain important animal products were as follows (in percent of output):[3]

Commodity	1935	1936	1937
Marketings			
Meat	74.8	73.6	80.0
Milk (and dairy products in terms of milk)	61.8	63.7	67.3
Wool	88.3	79.8	87.4
Obligatory deliveries			
Meat[a]	43.3	32.5	30.0[b]
Milk (and dairy products in terms of milk)	45.6	44.8	44.0[b]
Wool	55.9	50.1	54.7[b]

[a] Assuming an average yield of 50 percent in slaughter.

[b] All receipts of the state from kolkhozy amounted to about 50 percent of the kolkhoz output for meat, 57.9 percent for milk, and 80.4 percent for wool. Data for total deliveries to the state from *Socialist Agriculture USSR, 1938*, p. 45.

In appraising the proportion of marketed and delivered milk, the requirement of the kolkhozy for their calves must be considered.

[2] A. Arina, "Kolkhozy in 1938," *Socialist Agriculture*, December 1939, pp. 64 and 67.

[3] *Kolkhozy in the 2d Stalin Five-Year Period*, Gosplan (Moscow, 1939), p. 105.

The small amounts of produce used by the kolkhozy to feed the workers, for nurseries, and similar needs are worth segregating because they may be considered part of the income of the agricultural population.

In 1938 the kolkhozy used 0.8 percent of their grain production for invalids and children's nurseries, and 2.5 percent for other needs;[4] part of the latter item probably represents the feeding of the workers. In 1937 and 1938, respectively, 39.7 and 35 percent of the kolkhoz output of meat (including hog fat) is said to have been used by the kolkhozy for the feeding of workers in children's nurseries, while 3.7 percent was distributed among invalids in 1937.[5] But those percentages were computed from the meat and hog fat obtained by the kolkhozy from their own slaughterings, rather than from the total including live animals delivered and sold. The large deliveries and total marketings in 1935–37 would not have left so large a quantity of meat for use by the kolkhozy, nor is it likely that they would have been allowed to retain so much for themselves. In 1937 the kolkhozy used 6.5 percent of their output of milk, 19.4 percent of the butter, 23.4 percent of the eggs, and 11.8 percent of the honey for all those needs, i.e., feeding of workers, in children's nurseries, and for distribution to invalids, according to Nesmii (*loc cit.*).

As much as 89.2 percent of the kolkhoz sunflower-seed output in 1938 was used for deliveries and sales of all kinds, and for distributions on trudodni (p. 684). Since a certain quantity was needed for seed, the kolkhozy obviously could not have used for any other need more than a few percent of their output.

The kolkhozy are so bound by regulations pertaining to deliveries, sales, and various other uses, that they are entirely unable to maintain any stability in the distributions to the kolkhozniki from year to year. The obligatory deliveries are rigid. To adjust them to a low crop or output, the kolkhozy have to resort to default. In spite of severe penalties, defaults occurred to some extent before the war and became quite common during and after the war. Seed requirements per hectare should be en-

[4] Arina, *op. cit.*, p. 63.

[5] Data for 1937 from Nesmii, *op. cit.*, p. 86; data for 1938 from Arina, *op. cit.*, p. 68.

tirely fixed; if they are cut even moderately, the succeeding crop may be reduced. The requirements for feed grain are rather inelastic, especially in the kolkhozy. Most of their feed grain is used for horses, whose working efficiency must be maintained. The balance goes chiefly to the hogs in commercial fermy, whose meat deliveries to the state again are rigid. Only the payments for the services of the MTS vary in proportion with the crop. The bulk of the year-to-year variations in output is reflected in distributions to the kolkhozniki.

It is a peculiarity of "socialized agriculture" that stability in providing the producers with food produced by "their kolkhozy" is not believed necessary. The subject is one of many that are not supposed to be discussed.[6]

Cash transactions.—The cash receipts of 99 percent of all kolkhozy for which accounts were available amounted to 16,605 million current rubles in 1938. They were derived from the following sources:[7]

Source of receipts	Million rubles	Percent of total
Crops	10,162	61.2
Animal husbandry	3,703	22.3
Outside work	1,328	8.0
Subsidiary enterprises	764	4.6
Other sources	648	3.9
Total	16,605	100.0

Of the 10,162 million rubles received for crop products, 6,392 million came from obligatory deliveries and kontraktatsiya, 1,616 million from sales to government and co-operatives, and 2,154 million from sales in kolkhoz markets. The distributions of these and the corresponding cash receipts for slaughter products and other items of animal husbandry, as percentages of their respective totals, were as follows:[8]

Origin of receipts	Crops	Slaughter products	Other animal husbandry
Obligatory deliveries and kontraktatsiya	62.9	4.2	36.8
Sales to government and co-operatives	15.9	10.4	35.3
Sales in kolkhoz markets	21.2	85.3	27.9

[6] But one recalls Shepilov's cynical statement (p. 366) on the stability attained in the operations of the kolkhozy by the very regulations that inevitably result in greater instability in the receipts of the kolkhozniki. [7] Arina, *op. cit.*, pp. 64–65. [8] *Ibid.*, p. 64.

The cash receipts from the deliveries of crops to the government were relatively large because the prices paid by the government for fibers and some other technical crops, though low, were not extremely low. The principal item (in real value) in the deliveries—about 10 million tons of grain—brought in much less than one billion rubles. The cash receipts for all delivered animals and animal products were small, though the prices of wool were established on the same basis as for other fibers. For the live animals delivered the government paid scarcely the value of the skins, and the price of milk was similarly low.

The 1938 cash receipts of the kolkhozy were utilized as follows:[9]

Item	Billion current rubles	Percent of total
Taxes	1.50	9.0
Return of loans	0.08	0.5
Indivisible reserves	2.32	14.0
Production expenses	3.25	19.6
Administration and similar expenses	0.25	1.5
Education and other cultural expenses	0.50	3.0
Distributed on trudodni	8.70	52.4
Total	16.60	100.0

The 16.6 billion rubles of kolkhoz cash receipts and disbursements represented a small real value.[10] However, part of the money return on deliveries of certain technical crops on kontraktatsiya, and from sales of other products to the government and co-operatives (as contrasted to the obligatory deliveries of these products), entitled the kolkhozy to buy means of production at relatively low prices.

The purchases at privileged prices are mostly found in the above tabulation under "production expenses." These production expenses are specified in the source as "value of materials utilized in production,"[11] most of which were unquestionably of non-agricultural origin. Most important among the non-

[9] *Ibid.*, p. 66.

[10] Owing to this, one may ignore the fact that the receipts for outside work and from subsidiary enterprises were probably mostly non-agricultural incomes.

[11] Arina, *op. cit.*, p. 66, note.

agricultural materials used by the kolkhozy were fertilizer, worth perhaps 190 million rubles at 1926–27 prices,[12] and lumber, iron, and spare parts for the wagons and other machinery and implements. The fact that the kolkhozy spent as much as 3.25 billion rubles on materials utilized in production indicates that the prices they paid for them were much higher—for some of them perhaps several times higher—than the prices of 1926–27.

Both the cash receipts of the kolkhozy and the distributions of cash to the kolkhozniki increased rather rapidly from year to year. The cash receipts amounted to 4.6 billion rubles in 1932, 9.7 billion in 1935, 14.2 billion in the favorable year 1937,[13] and 16.6 billion in the unfavorable year 1938. The standard explanation of this rise is the growth of kolkhoz production and an even greater increase in the marketed portion of the production.[14] Actually, inflation played a large part in it, in addition to the increase in the number of households collectivized.

KOLKHOZNIK RECEIPTS FROM THE KOLKHOZY

Per year.—Among the receipts of the kolkhozniki from the kolkhozy, the Soviet publications usually mention only grain and cash. The cash receipts, their size, and their uninterrupted rise from year to year are greatly emphasized. Laptev, for example, used the increase in cash income as the principal proof of the rising incomes of the kolkhoz peasants.[15] But the value of the cash receipts was almost negligible compared with what the usual assertions would make them appear, and their rise was, at least to a very large extent, caused by monetary inflation.

Aside from cash and grain, the comprehensive official study on the kolkhoz economy during the 2d Five-Year Period mentioned only the distribution of potatoes.[16] The distributions of all other foods are indeed quite small. Though rarely mentioned, the roughage obtained from the kolkhozy, and the use

[12] The total value of commercial fertilizer in 1938 was estimated at 210 million rubles (Appendix Note O, p. 770).

[13] *Kolkhozy in the 2d Stalin Five-Year Period*, p. xii.

[14] *Ibid.* See also Joseph Stalin, *Problems of Leninism* (11th ed.), Moscow, 1947, p. 586.

[15] I. D. Laptev, *Soviet Peasantry* (Moscow, 1939), p. 117. See also D. Shepilov, *Socialist Kolkhoz Property* (Moscow, 1940), pp. 74, 75, 80, 85, and others.

[16] *Kolkhozy in the 2d Stalin Five-Year Period*, pp. 110–13.

of pastures which were made kolkhoz land by the collectivization, are of great importance to the kolkhozniki.

Sufficient data to give a rough idea of the share of the kolkhozniki in the kolkhoz produce are unfortunately available only for 1937 and 1938.[17] Basyuk's monograph gives the following data on the share of the kolkhozniki in the kolkhoz output in 1937 (in percent of respective totals by weight):[18]

VEGETABLE PRODUCTS		ANIMAL PRODUCTS	
Grain	35.9	Milk	7.6
Sunflower seed	27.0	Butter	26.6
Linseed	3.7	Meat and fat	48.8
Flax	2.6	Wool	7.7
Hempseed	15.7	Honey	35.1
Hemp	3.4	Eggs	26.6
Potatoes	45.4		

The figure for meat and fat clearly pertains only to the small slaughterings of the kolkhozy. According to official data (p. 684), the kolkhozy in 1937 delivered or sold 80 percent of the meat they produced, which certainly included live animals as well as meat and fat proper. Of the total kolkhoz output of meat and hog fat, the kolkhozniki received less than 10 percent.[19] Although their share in milk, the second most important animal product, was also less than 10 percent, Professor Basyuk said: "A substantial proportion of the animal production [of the kolkhozy] is likewise distributed among the kolkhozniki."

For 1938 Arina stated the amounts distributed among the kolkhozniki in percent of the total output of the kolkhozy for total grain, most grains individually, potatoes, sunflower seed, vegetables (probably only vegetables of Type 1; see definition page 595), fruits, and hay. As to livestock products, he said: "The products of animal husbandry are distributed on trudodni only in certain oblasti and kraya, where the kolkhoz animal

[17] The detailed data for 1937 were obtained only after completion of this chapter. For this reason, the 1938 data appear to have been given greater attention.

[18] T. L. Basyuk, *Organization of Kolkhoz Production* (Moscow, 1946), pp. 272–73. The wording of the study implies that nothing else was distributed, although this certainly was not the case. For animal products Basyuk also gives data for 1936, of which no use can be made in the absence of data on crops.

[19] The statement of Arina on the distributions of animal products and specifically meat in 1938 is supporting evidence (see below).

husbandry has been considerably developed."[20] He also pointed out that only 16,235 kolkhozy, or 6.8 percent of the total, distributed meat (including hog fat) on trudodni.

Table 55 utilizes Arina's data, some of Basyuk's, and some computations and estimates of the writer to provide an approximate summary of distributions in kind to the kolkhozniki in 1938. The attempt was made to include all receipts except the value of the use of pasture.[21] The total amounts to about 1.7 billion rubles at 1926–27 prices. An itemized computation for the excellent year of 1937, made exactly in the same way as for 1938 but not reproduced here, yields a figure of 2,890 million rubles.

The 1938 distribution for which data are available consisted specifically of the following approximate quantities in kilograms per year:

Product	Per household	Per person
Grain	980	224
Food	823	188
Feed[a]	157	36
Potatoes	298	68
Sunflower seed	17.9	4.1
Vegetables	30.0	6.9
Fruits	14.4	3.3
Hay	438	100

[a] According to Arina, *op. cit.*, p. 67, 10.2 percent of the distributed grain was oats and barley, and 6.4 percent was other grains, probably chiefly corn.

The kolkhozy produced 4,320,589 tons of milk in 1937. Hence Basyuk's evidence implies a distribution of milk of about 18 kilograms per kolkhoz household or about 4½ kilograms per person. A similar computation for meat (and fat) cannot be made exactly, but 5 kilograms per household or 1¼ kilograms per person seems to be the maximum possible.

Since the per capita consumption of food grain by the rural population was about 260 kilograms, the kolkhozniki in 1938 received from their kolkhozy only about three-quarters of their

[20] Arina, *op. cit.*, p. 68.

[21] The value of the use of pasture was neglected because the computation had to correspond to official computations of the value of gross production, which disregard pasture (see page 658). The value of the use of pasture was disregarded also in the computations of the value of agricultural production before collectivization, which are used below (p. 694) for comparison of the returns per workday before and after collectivization.

TABLE 55.—KOLKHOZ PRODUCE DISTRIBUTED AMONG THE KOLKHOZNIKI IN 1938: AN APPROXIMATION

Product	Approximate kolkhoz production		Distribution		1926–27 prices (*rubles per ton*)	Value of distribution (*million rubles at 1926–27 prices*)
	Million tons	Million rubles	Percent of production[a]	Thousand tons		
Vegetable products						
Grain	66.7[b]	...	26.9	18,000[b]	...	977.1
Wheat	...	...	...	9,700[c]	61.2	593.6
Other	...	...	...	8,300	46.2	383.5
Potatoes	20.0[d]	...	27.4	5,480	26.7	146.3
Sunflower seed	1.64[e]	...	20.2	332	78.0	25.9
Vegetables	...	462[f]	10.2[g]	...	...	48.7
Fruits (incl. grapes)	...	180[h]	6.7[i] / 5.6[j]	...	...	11.5
Hay	...	1,100	15.7	...	...	172.7
Other food and fiber	...	...	...	...	...	50.0
Other feed (except pasture)	...	...	...	...	...	150.0
Total vegetable products						1,582.2
Animal products						
Meat and fat	...	300[k]	10.0	...	...	30.0
Milk (incl. butter in terms of milk)	...	330[k]	12.0	...	...	39.6
Eggs	...	100[l]	28.0	...	...	28.0
Wool	...	55[k]	8.0	...	...	4.4
Total animal products	...	...	...	...	...	102.0
Grand total	...	...	...	...	...	1,684.2

[a] Data for vegetable products from Arina, *op. cit.*, pp. 63 and 67; for animal products, estimated from data in Basyuk, *op. cit.*, pp. 272–73, and others.

[b] Data from Table 60, p. 738.

[c] Arina (*op. cit.*, p. 67) stated that of the grain distributed to kolkhozniki 54.3 percent was wheat.

[d] Assuming a yield 5 percent higher than the USSR average.

[e] USSR average yield applied.

[f] Total output prorated according to acreage; yield obtained under average weather conditions assumed.

[g] The percentage given for vegetables of Type 2 was applied to all vegetables.

[h] Forty percent of total USSR production as estimated by the writer.

[i] Fruits.

[j] Grapes.

[k] The 1937 value of the kolkhoz output was given in *Kolkhozy in the 2d Stalin Five-Year Period*, p. 81, at 257.9 million rubles (meat and fat), 300.1 million (milk), and 50.1 million (wool).

[l] The writer's rough approximation.

requirements. Moreover, the kolkhozniki had to part with at least 10 percent of the bread grain to have it ground into flour. The kolkhozniki got less than half of the food potatoes they needed, enough oilseeds to have perhaps one kilogram of oil per person that year, and similarly negligible quantities of other foodstuffs.

While in 1937, thus far the best year of socialized agriculture, the kolkhozniki received adequate amounts of grain, their other food needs, even for potatoes, were not fully covered by the distributions of their kolkhozy, and most of them were covered only in negligible proportions.

The cash distributions in 1938 amounted to 480 rubles per household, or 242 rubles per adult worker participating in the kolkhoz work. The total cash income per kolkhoz household of the households investigated was 1,806.6 rubles in 1937.[22] Since the average receipts per kolkhoz household in all USSR were only 376 rubles in the same year,[23] the cash received from the kolkhozy amounted to little more than 20 percent of the total cash receipts of the kolkhozniki. No better proof is needed that the emphasis officially placed on the cash receipts of the kolkhozniki from their kolkhozy and on the large increase in those receipts in the 'thirties is entirely baseless. To be on the safe side, the cash receipts of all kolkhozniki from their kolkhozy is assumed to have been equivalent to 15 and 30 percent of the receipts in kind from the kolkhozy in 1937 and 1938 respectively.

Thus the receipts of the kolkhozniki from their kolkhozy amounted to 3,325 million and 2,190 million rubles in 1937 and 1938 respectively. The feeding by the kolkhozy of their workers, children in nurseries, and invalids, is estimated at 250 million rubles for 1937 and 1938 each.[24] Theft of grain other than seed grain by the kolkhozniki from the kolkhozy was estimated by the writer at 3 million tons (see pp. 741–43), with a value of roughly 150 million 1926–27 rubles. The total of such theft may well have reached 250 million rubles at the same

[22] Nesmii, *op. cit.*, p. 100.
[23] *Kolkhozy in the 2d Stalin Five-Year Period*, p. 110.
[24] The estimate was made before Nesmii's more detailed figures (p. 685) were at hand.

prices. Thus the total receipts, legal and illegal, of the kolkhozniki from their kolkhozy, as accounted for here, were as follows (in million rubles at 1926–27 prices):

	1937	1938
Receipts in kind and money	3,325	2,190
Feeding	250	250
Theft	250	250
Total	3,825	2,690

The average of those figures is around 3⅓ billion rubles or the amazingly small amount of 41 rubles ($21) per capita of the kolkhoz population per year.

The total kolkhoz distributions to the kolkhozniki certainly increased considerably in 1932–38 (no data on the distributions before 1932 are available). One can also be certain that there was a substantial increase in distributions per person, the number of which increased by 30.5 percent from 1932 to 1938.[25] But the evidence is insufficient to establish an exact relationship between the increase in distributions to kolkhozniki and the increase in output of the kolkhozy over the period.

The total distributions by the kolkhozy to the kolkhozniki in 1939 to 1940 at best remained at the 1938 level. It is known for certain only that the distributions of grain were smaller in 1939 than in 1938, in spite of the better crops (Table 60, p. 738), and the improvement, if any, was small in 1940 when crops were still larger. It is against the writer's inclination to attempt a determination of how much total distributions to the kolkhozniki fell during the war and first postwar years.

Earnings per day.—Statistical material on workdays in kolkhozy is less plentiful than that on trudodni, and the concept of kolkhoznik earnings per workday does not exist in the Soviet Union at all. The succeeding analysis is therefore concentrated primarily on earnings per trudoden.

Total receipts of the kolkhozniki from their kolkhozy, including feeding by the kolkhozy in the field, in children's homes, and so on, as well as theft by the kolkhozniki from the kolkhoz,

[25] See *Kolkhozy in the 2d Stalin Five-Year Period*, p. 1, for numbers of households, and p. 712, n. 15, for the average number of persons per household.

are estimated at 3,825 million and 2,690 million 1926–27 rubles respectively in 1937 and 1938 (see above, p. 693). Since the total number of trudodni earned in those years was 7,893 million and 8,005 million (Table 28, p. 411), the return per trudoden was equivalent to 48.5 and 33.6 kopeks respectively.

The average earning per workday of persons sixteen years of age or older in 1937 and 1938 will be assumed to have been 1⅓ trudodni. Hence the return per workday was equivalent to 64.7 and 44.8 kopeks in 1937 and 1938 respectively or around 55 kopeks on the average. By comparison, the approximate income from agriculture per workday in 1927–28 was 135 kopeks.[26] There is real justification in comparing the relation of the kolkhozniki to their kolkhozy with that of the serfs to their landlords before Emancipation.

It is unfortunately impossible to make a detailed computation of the receipts of the kolkhozniki from their kolkhozy for the years before 1937. Grain was the major product distributed on the trudodni. In 1938 its value amounted to almost one half of the total receipts of the kolkhozniki from the kolkhozy in products and money (see pp. 691–92). In the years for which data are available the distributions of grain were as follows (in kilograms per trudoden):[27]

[26] The total income from agriculture in 1927–28 was estimated on page 680 at 9.2 billion 1926–27 rubles. The average number of days worked in agriculture in that year by able-bodied adult persons was assumed to have been 137 days (pp. 418–19). The number of these persons was probably around 45 million. Thus the total number of workdays in agriculture was 6.2 billion days, or 6.5 billion with an allowance for children's work. Hence the return per day in that year works out to slightly over 140 kopeks. The figure is cut to 135 kopeks to allow for the agricultural tax, which in 1927–28 amounted to 375 million rubles (*Control Figures of the National Economy USSR for 1928–29*, Gosplan, Moscow, 1929, p. 448). The kolkhozniki pay no tax on that part of their income which is obtained from the kolkhozy.

[27] Data for 1932, 1935, and 1937 from *Kolkhozy in the 2d Stalin Five-Year Period*, p. 110; other official sources for 1933, 1934, and 1936. The distributions in 1938 and 1939 were derived from the total quantities distributed on trudodni as computed in Table 60, p. 738, and the total number of trudodni as shown in Table 28. The figure for 1940 is based on the statement by N. I. Anisimov in "Socialist Agriculture at the Thirtieth Anniversary of October," *Socialist Agriculture*, October 1947, p. 13, that in that year the distribution of grain per able-bodied person was 1.5 times that of 1936 (as usual he chose the worst year for his comparison; he also used the yearly basis, which gives the better result, rather than the natural basis of distribution per trudoden). The number of trudodni per person increased from 174 in 1936 to at least 220 in 1940 (see Table 28, p. 411, in conjunction with tabulation on p. 412; the 1940 figure in the latter is uncertain).

1932	2.3	1937	4.0
1933	2.9	1938	2.2
1934	2.8	1939	1.9
1935	2.4	1940	1.9
1936	1.6		

The figures in the tabulation incidentally show the exceptional character of the 1937 grain distribution and emphasize the unfairness of the almost exclusive use of that year's figure to demonstrate the benefits accrued to the kolkhozniki from the kolkhoz system.

The distribution of animal products on trudodni was almost discontinued during the 'thirties. Between 1932 and 1937 the kolkhoz output minus marketings of meat and fat declined from 328,900 tons to 108,000 tons, that of milk and dairy products (in terms of milk) from 2,239,700 to 1,426,800 tons.[28] Since the number of trudodni more than doubled over the period, those figures imply a decline in distributions per trudoden (including feeding of workers and similar uses) to less than one-seventh for meat and less than one-third for milk and dairy products.

From 1932 to the summer of 1938, cattle and sheep of the kolkhozniki were increasing more rapidly than the total number of trudodni (Chart 23, p. 351 and Table 28, p. 411); hence the value of the roughage obtained per trudoden from the kolkhoz must have been rising. But the process was sharply reversed after 1938, when the total number of trudodni continued to increase while the herds of the kolkhozniki were diminishing.

Money was the only other item that showed an increase in the distribution per trudoden during the 2d Plan Period; and it continued to rise in 1938 and in later years. The increase up to 1938 was as follows (in kopeks per trudoden):[29]

1932	42	1937	85
1935	65	1938	109

Cherny stated that money distributions per household in-

[28] *Kolkhozy in the 2d Stalin Five-Year Period*, p. 105.
[29] *Ibid.*, pp. 36 and 110, and Arina, *op. cit.*, p. 68.

creased by 53.4 percent from 1938 to 1940[30] (this figure pertained either to prewar USSR or to the territory unoccupied by the enemy in 1944). While the number of trudodni per household was increasing in 1938–40, a substantial rise in the money distributions per trudoden is beyond doubt.

However, the real value of the money unit declined greatly in the prewar decade, and anyway the money receipts of the kolkhozniki from their kolkhozy made up only a moderate part of their total receipts (the cash receipts are here roughly estimated at 15 and 30 percent of the receipts in kind in 1937 and 1938 respectively; see above, page 692). Consequently, a real increase in money receipts per trudoden during the 2d Plan Period (if there was one in terms of money reduced to a comparable basis), in conjunction with the increased receipts of roughage, may still have failed to compensate for the decline in the distributions of products other than money and roughage.

The fact that the real value of the trudoden did not decline or declined only a little during the 2d Plan Period, when the number of trudodni were increasing more rapidly than the kolkhoz output, was due to the peculiar position of the kolkhozniki as shareholders of a sort whose income rises under favorable conditions much more than total gross return. There was, it is true, a strong counteracting effect in that state takings were also rapidly increasing.

The findings for the trudoden indicate a moderate increase in earnings *per workday* during the 'thirties.

The war naturally made the situation even more precarious. While the output of the kolkhozy declined sharply, the state's share in it increased.[31] This obviously implies that the share of the kolkhozniki declined more than the total output. Since the total number of trudodni was at least maintained (pp. 412–13), distributions per trudoden must have fallen severely. The decline per workday was not quite so great.

No summarized data on distributions to the kolkhozniki, even of grain, for any war or postwar year are available. Indeed,

[30] G. Cherny, "The Financial Economy and the Indivisible Funds of the Kolkhozy," *Socialist Agriculture*, February 1947, p. 31.

[31] Cherny (*op. cit.*) speaks of an increase in "the marketed portion of output" in the war years; but almost all that the kolkhozy marketed went to the state.

even individual evidence is extremely scarce. Losa wrote early in 1945:[32]

> The return per trudoden of 2 to 2.5 kilograms of grain is assured in the kolkhozy of the steppe [Chernozem] zone with a harvest of 9 to 10 quintals per hectare of grain and in the non-Chernozem zone with a harvest of 14 to 15 quintals per hectare.

How negligible was the chance for the kolkhozniki to receive the stated 2 to 2.5 kilograms in 1945 and 1946 is obvious from the fact that the average yield of grain was 7.6 quintals per hectare in 1945 and considerably below this figure in 1946.[33]

A guaranty of one kilogram of grain per trudoden is given to city workers mobilized for harvest work. It would not make sense unless the grain "value" of the trudoden had greatly depreciated since the prewar years. Scattered data found in the Soviet press show that distributions below average prewar levels are greatly boasted of.[34] The writer would not be surprised to find that the average distribution of grain per trudoden in 1945 and in 1946 was one kilogram, or perhaps even less.

The minimum of 3.0 kilograms of food grain per trudoden that the tractor drivers, brigadiers, assistant brigadiers, and fuel controllers received until February 1947 unconditionally, and now receive on condition that the goals for yields be fulfilled, have become a real fortune since the start of war. This occurred despite the fact that, owing to the poor condition of the tractors and for other reasons, the tractor drivers were earning considerably less than before the war, even before their right to

[32] G. Losa, "Progressive Experience in Managing the Kolkhoz Economy," *Socialist Agriculture*, January-February 1945, p. 12.

[33] The figure for 1945 was implied by A. A. Andreev ("On Measures to Raise Agriculture in the Postwar Period": Report to the Central Committee of the Party, February 1947, printed in *Socialist Agriculture*, Mar. 7, 1947). It was officially recognized that the 1946 grain crop and, even more, the grain yield, were substantially below those of 1945.

[34] In a report from Novosibirsk oblast on the activities of a kolkhoz named "The Builder of Socialism," entitled "Great Results Had Been Attained" (*Socialist Agriculture*, Jan. 25, 1947), one can read: "To the kolkhozniki a full-weighty trudoden is assured. Already, 2 kilograms of grain have been distributed as against 800 grams in 1945." Little, if anything, could have been distributed from the 1946 crop after the date of the report. In a report on the activities of the kolkhoz named "Chapaev," in West-Kazakhstan oblast, entitled "Rich Incomes" (*Socialist Agriculture*, Jan. 22, 1947), it is stated: "The kolkhozniki are receiving high incomes. Per trudoden are being distributed 1.5 kilograms of grain, 1 kilogram of potatoes, 1.2 kilograms of vegetables, money, feed."

In the very favorable year 1937, the only one for which comparable data are at hand, the average distribution of grain per trudoden was 4.2 kilograms in Novosibirsk oblast and 3.9 kilograms in Kazakhstan (*Kolkhozy in the 2d Stalin Five-Year Period*, p. 111).

receive the minimum was qualified as stated. But the receipts of the ordinary peasants declined so much more that the position of the tractor drivers as the rich of the villages became even more pronounced than before the war.

The kolkhozy are heavily in debt to the tractor drivers. From 120,000 tons in 1942, the indebtedness in grain rose to 220,000 tons in 1944. In 1945 the tractor drivers received only 60 percent of their current earnings and of the old indebtedness in grain.[35] When a drive for "voluntary" sales to the state by individual kolkhozniki was effected in the fall of 1946, the tractor drivers were frequently the only ones who had anything that could have been taken from them.

KOLKHOZNIK RECEIPTS FROM OWN ENTERPRISES

The gross production of the kolkhozniki in 1937 was officially estimated at 4.3 billion 1926–27 rubles or 21.5 percent of the total gross agricultural production (Table 1, p. 47). The writer's estimate of total 1937 gross agricultural production is nearly 10 percent below the official estimate (Chart 4, p. 65). However, the kolkhoznik output consisted largely of animal products, which would be less overvalued than crops in the official computation. Hence the writer assumes it to have been about 4.2 billion 1926–27 rubles.[36] The corresponding figure for 1938 may have been 3.6 billion.

The above sums are reduced by 12 percent for obligatory deliveries to the state.[37] Hence the gross production of the kolkhozniki from their enterprises so far as they remained at their disposal, was equivalent to about 3.7 and 3.2 billion rubles respectively in 1937 and 1938. In comparing these figures with the receipts from the kolkhozy, allowance must be made for the fact that the livestock products, produced from feedstuffs ob-

[35] *Socialist Agriculture*, Aug. 17, 1946.

[36] An itemized computation leads to a lower figure, as follows (in million 1926–27 rubles):

Livestock products	2,000
Increase in herds	300
Potatoes and vegetables	1,000
Other products	250
Total	3,550

[37] Deliveries of all products are assumed to have averaged about 15 percent by value; about one-fifth of this may have been covered by the payment received for the deliveries.

tained from the kolkhozy, made up a considerable portion of the total output of the kolkhozniki. Even so, the comparison shows that the official assertion that receipts from the kolkhozy were the principal source of income of the kolkhozniki, and their own production the subsidiary source,[38] was unjustified. This relationship was aimed at, but had not been attained when the USSR entered the war. The assertion was only a transfer of the relationship existing between the *total outputs* of the kolkhozy and kolkhozniki to the relationship between the sources of income of the kolkhozniki. Neither the total income of the kolkhozniki nor its origin has ever been properly computed officially.

According to Table 27 (p. 393), the kolkhozniki on the average used 104.2 days per household on their enterprises in 1939. Hence the total labor input in kolkhoznik enterprises was equivalent to 1.9–2.0 billion days. To compute the reward per workday from the gross value of the output of the kolkhozniki's own enterprises, the value of seed, feed, and other materials, as well as that of the obligatory deliveries and taxes must be deducted. The balance probably averaged moderately above 2.5 billion rubles. Thus the income of the kolkhozniki from work on their own farm enterprises returned 125–130 kopeks per day. This is almost the same as the average income per workday of the peasantry before collectivization, and about two and one-fourth times as much as their total receipts per workday from their kolkhozy.

KOLKHOZNIK RECEIPTS FROM THE TWO MAJOR SOURCES

Total receipts of the kolkhozniki from the kolkhozy and their own enterprises work out as follows (in million rubles at 1926–27 prices):

Source of receipts	1937	1938
Kolkhozy	3,825	2,690
In kind and money	3,325	2,190
Feeding	250	250
Theft	250	250
Own enterprises	3,700	3,200
Total	7,525	5,890

[38] See, for example, Laptev, *op. cit.*, pp. 130–31.

The products used by the kolkhozniki for feed that are included in the above totals may be estimated at 1,200 million and 900 million 1926–27 rubles in 1937 and 1938 respectively.[39] In each of those years the kolkhozniki may have spent 75 million 1926–27 rubles on purchases of seed, repairs of implements, and hired labor other than that of other kolkhozniki (mostly individual peasants). Hence the income of the kolkhozniki from the kolkhozy and their own enterprises (before deducting the agricultural tax) amounted to 6.2 and 4.9 billion 1926–27 rubles for 1937 and 1938 respectively.

The national income from agriculture in 1937 was around 10.3 billion 1926–27 rubles (pp. 679–80). Consequently, the kolkhozniki obtained from the kolkhozy and their own enterprises about 60 percent of the total national income from agriculture. (Their total income from agriculture was higher because of their earnings from work for sovkhozy and MTS.) Can the remaining 4 billion rubles or thereabouts (roughly 40 percent of the national income from agriculture) be accounted for?

The share of the sovkhozy in the 1937 national income from agriculture may have been around 900 million rubles, of which probably 800 million were absorbed by the salaries and wages of the personnel.[40] Salaries and wages paid by the MTS were estimated at 350 million rubles (pp. 293–94). The income of rural and urban workers and employees and the individual peasants from agriculture may be placed at 600 million rubles. The total thus far accounted for, other than that going to the state, is 1,750 million 1926–27 rubles, which leaves a balance of around 2¼ billion rubles. This sum seems reasonable as the share of the state in the national income from agriculture, not including the proceeds from the agricultural tax. Let us check further.

The sovkhozy are assumed to have made a profit of 100 million rubles in such a favorable year as 1937. (This sum would of course be far too small to cover land rent and interest on the

[39] The figures are based on itemized estimates not presented here.

[40] It is assumed that in normal years the wages of workers and employees of the sovkhozy were equivalent to the national income accrued from them.

invested capital.) The MTS may have returned a profit of 250 million rubles, partly owing to the same factor of exceptionally favorable conditions for the 1937 crops. The deliveries of the kolkhozniki were estimated above as involving a net gain for the state of 525 million rubles. The remainder, roughly 1.5 billion rubles, was the net gain for the state from deliveries of the kolkhozy and individual peasants, and from the profit on charges for grinding grain.

The national income from agriculture in 1938, computed at 9.4 billion 1926–27 rubles (pp. 679–80), cannot be used for comparison with the computation of the income of the kolkhozniki from their kolkhozy and their own enterprises, because the first was computed for normal weather conditions. The actual national income from agriculture in 1938 probably did not exceed 8.5 billion rubles. The income of the kolkhozniki from the kolkhozy and their own enterprises, estimated above at 4.9 billion, amounted to little less than 60 percent of this amount.

INCOME OF THE POPULATION ENGAGED IN AGRICULTURE

The income of the population engaged in agriculture in 1937 appears to have been as follows (in billion 1926–27 rubles):

Income of the kolkhozniki from the kolkhozy and their own enterprises	6.3
Wages paid by the sovkhozy and MTS	1.15
Rural and urban workers and employees and individual peasants	0.6
Total	8.05

This total, essentially, can also be obtained by subtracting from the total national income from agriculture (10.3 billion rubles) the share of the state in that income (2¼ billion rubles).

The average income of the population engaged in agriculture in 1937 and 1938 may have been about 7.4 billion rubles. This figure compares with 9.3 billion in 1927–28. If the agricultural tax is deducted, the figures become about 7.2 and 8.9 billion respectively. Since the rural population depending on agriculture is assumed to have declined by 12.5 to 15 percent over the period (Appendix Note A), the indicated contraction of per

capita income from 1927–28 to 1937 and 1938 is equivalent to about 10 percent. This would have been bad enough, but since the proportion of the agricultural population with relatively large incomes increased greatly over the period, the incomes of the average peasants fell considerably more than 10 percent.

Before collectivization the incomes of the rank-and-file peasants were only negligibly below the average for the whole agricultural population. The professional people with their dependents constituted a mere one-half percent of the total farm population. Moreover, their incomes, coming almost exclusively from the national treasury, need not be considered here. The highest group of peasants represented only 6 percent of the total, and their per capita income was probably no more than 50 percent above the average (Table 10, p. 177). Hence the per capita income of the remaining peasants was only 3 percent below the average.

Lack of adequate data prevents making a similar computation for 1938. But the large number of the better-paid employees in sovkhozy and MTS, and the relatively high incomes of the tractor drivers, brigadiers of tractor brigades, combine operators, and the like, in kolkhozy, MTS, and sovkhozy, leave no doubt that the incomes of the unprivileged farm population was at least 15 percent below the average for the whole farm population in that year. Hence the average income of such kolkhoz and individual peasants in 1938 was 20 percent or more below that in 1928. It is not difficult to visualize what this means in view of the extremely low income in the earlier year.

The official assertion that the expansion of the well-to-do in the village life was greatly promoted by collectivization must be classed with the greatest lies in history. Stalin said it most emphatically: "The characteristic peculiarity of our Revolution is in that it not only gave the people freedom, but also material goods, the possibility of a well-to-do and cultural life."[41] Benediktov, the Commissar of Agriculture, wrote in an article devoted to the Agricultural Exhibition of 1939: "The Exhibition shows the vast growth of well-to-do life and culture of kolkhozy and

[41] Quoted from *Kolkhozy in the 2d Stalin Five-Year Period*, p. xii.

kolkhozniki, comparing the joyful life of the Soviet kolkhoz peasantry with the haggard, pauper existence of the broad working masses of the village of Czarist Russia."[42] Actually those broad masses had in 1938 about 20 percent less income than before collectivization. The share of the nobility, other owners of large farms, and of the larger peasants was much greater before the Revolution than the share of the larger peasants after the Revolution, but part of this disadvantage for the average and poor peasants was offset by a more favorable relationship between the prices of farm and non-farm products and better wages for those who had to work as farm hands. The broad masses of the village work much more now than either before the collectivization or before the Revolution. The loss of the highly valued status of being their own bosses comes in addition.

The decline in incomes and living standards of the peasants (kolkhoz and individual) is obvious also from the analysis of their incomes and expenditures in kind and (current) money. As was shown in Part I, the diet of the peasants, on which they are spending by far the predominant portion of their income, deteriorated considerably during the 'thirties. The gross money incomes of the peasants amounted to around 30 billion rubles in 1937 and 35 billion in 1938. Of these totals, respectively, 7.0 and 9.0 billion were cash distributions and payments of the kolkhozy to peasants, 5.5 and 6.0 billion were wages and salaries on state farms and in MTS, and 15 and 20 billion were their returns from sales in kolkhoz markets. The peasants had to spend about 3 billion rubles for taxes and practically obligatory subscriptions to state loans. About 40 percent of the balance had to be used for food purchases in the state shops and in kolkhoz markets. Thus in 1937 and 1938 they had about 16 and 19 billion rubles respectively for purchase of industrial goods and for payment of services.

Since industrial goods increased in price by perhaps seven to eight times, little more than 2 billion rubles at 1927–28 prices was available for the purchase of these goods. In 1927–28 the rural population spent 4,291 million rubles for industrial goods

[42] I. Benediktov, "All-Russian Parade of the Socialist Agriculture," *Socialist Agriculture*, July 1939, p. 3.

and 163 million rubles for the products of forestry, fishing, and hunting,[43] or a total of 4.4 billion rubles. The purchases of industrial goods in 1927–28 were larger than in 1937 or 1938, even on a per capita basis, after the purchases of means of production are excluded from the 1927–28 total.

It is quite a task under such conditions to prove "the uninterrupted rise of the economic status . . . . of the kolkhoz village" brought about by "the gigantic achievements of socialist agriculture."[44] Indeed, it is necessary, in furnishing the evidence, for Soviet officials to resort to comparisons of distributions of grain in 1937, thus far the best year of kolkhoz agriculture, with those in 1932, when millions of kolkhozniki were starving to death. Obviously, the figures are best for official purposes when taken per year rather than per day, because of the large increase in the numbers of trudodni and workdays per person per year. The standard and indeed practically the only comparison in the Union is the increase in the annual distributions of grain per household from 36.6 poods in 1932 to 106.2 poods in 1937, and of money from 108 to 376 rubles.[45] The latter figures, of course, are without allowance for the depreciation of the currency by monetary inflation. The increase in sales of consumers' goods in the village in terms of such unadjusted rubles from 1932 to 1938 is another favorite proof of the increasing well-being of the kolkhozniki.[46]

To make the peasant incomes of the late 'thirties appear large, one must evaluate the peasants' consumption of their own produce at the extremely high prices of the kolkhoz markets, although it was obviously impossible for them to eat the food and simultaneously to cash in on the high prices obtainable for it. But this is what is done in the USSR. For that computation, moreover, data for 1937, with its exceptionally large distributions, are employed as usual.[47] The small quantity of food which

[43] *Control Figures . . . . for 1929–30*, pp. 480–81.

[44] N. I. Anisimov, *The Victory of Socialist Agriculture* (Moscow, 1947), p. 90.

[45] *Socialist Agriculture USSR, 1938*, p. 97.

[46] *Ibid.*, p. 99.

[47] *Kolkhozy in the 2d Stalin Five-Year Period*, p. 114. Unbelievable as it may seem, an American authority on Soviet economics followed almost fully this objectionable procedure in a paper read in one of the greatest American universities. He too used the distributions of 1937, when they were at their greatest, and applied the prices in the kolkhoz markets to

the peasants were permitted to retain for themselves in the late 'thirties cannot be made larger, however high a price the analyst may put on it.

The analysis here is limited strictly to agriculture and agricultural income. The considerable increase in schooling and improvement in medical help during the 'thirties are matters of record. The distinction between enlargement in one case and improvement in the other is made advisedly. The peasants may be reluctant to count as an addition to their income the increased cost of teaching Marx-Engels-Lenin-Stalin to their children.

all quantities which had remained with the kolkhozniki for their own use. The incomes of the rural population, thus computed, were then compared with the incomes of the urban population, only a small part of which had the extremely low purchasing power of money spent in the kolkhoz markets.

A qualification of the writer's computations may be made. Since his analysis is in terms of 1926–27 prices, it does not take into consideration the gains which the kolkhozniki and individual peasants made from selling their products in kolkhoz markets at prices relatively higher than those of goods they bought. It is estimated that in 1936 about 75 percent of all sales of farm products in kolkhoz markets were made by kolkhozniki and about 10 percent by individual peasants. Part of these sales, it is true, were made to purchasers in the same groups, or the sales were accompanied by purchases of other foods from government and co-operative stores. Whatever gains were made were very unevenly distributed, the peasants near the large urban centers benefiting most. Absence of adequate statistics, especially of price data, makes it impossible to compute the gains involved.

APPENDIX NOTES

APPENDIX NOTES

NOTE A

POPULATION ENGAGED IN AGRICULTURE, 1928 TO 1939

In order properly to appraise the results of a reorganization of agriculture, one should know what effect this reorganization had on the size and composition of the agricultural population. Unfortunately, even this fundamental question cannot be answered precisely on the basis of official statistics or any others.

Lorimer's comprehensive book, despite shortcomings, will probably be the standard work in English on Russian population for some time to come. He puts the farm population in 1926–28 at 114.1 million, and at 91.8 million (Assumption B) or 97.1 million (Assumption A) in 1938–39.[1] The term "farm population," as he used it, includes not only farmers but also those engaged in forestry, fishing, and hunting.

Lorimer does not deal with the problem of the extent to which the population engaged strictly in agriculture—and, specifically, the population engaged on an approximately full-time basis—changed over the period. This necessitates the following discussion. Moreover, Lorimer's analysis of the farm population can apparently be improved on the basis of evidence not accessible to him. The rather tentative conclusion reached by this analysis is that the population engaged in agriculture on an approximately full-time basis declined by 12.5 to 15 percent between 1926–28 and 1939, and that the number of adult persons engaged in agriculture declined less than the total population so engaged—perhaps by only 10 percent.

A substantial change in handling occupational statistics occurred during the period in question. This makes the analysis difficult and the conclusions uncertain. Before the collectivization drive, Russian statistics dealt with the population depending on rural economy, which included forestry, fishing, and hunting in addition to strictly agricultural pursuits. Moreover, this classification included a great many persons who derived large parts of their income from other pursuits; the general tendency, when in doubt, was to put such persons into the big barrel, rural economy. The later statistics not only excluded those engaged in forestry, fishing, and hunting, but reversed the previous tendency by reducing the population dependent upon agriculture, assigning people with agricultural and non-agricultural occupations to other pursuits, thus emptying the barrel of agriculture as much as possible.[2]

[1] Frank Lorimer, *The Population of the Soviet Union: History and Prospects*, League of Nations (Geneva, 1946), p. 110.

[2] Another difficulty lies in the change in the most pertinent terms during the period involved. At the time of the 1926 census the term *selskoe khozyaistvo* meant rural economy, although it was used also in the sense of agriculture; *zemledelie* meant strictly agriculture, while *rastenievodstvo* stood for crop production including pasture. By the time of the 1939 census, *selskoe khozyaistvo* meant agriculture, and *zemledelie*, crop production including pasture. But the use of both terms in the old sense continued. Precise use of terms is not among Russian virtues. No space can be devoted to giving reasons why the same Russian

The present analysis, even more than Lorimer's, focuses on the population changes between the censuses of December 17, 1926 and January 6, 1939, a period of approximately twelve years.

BEFORE COLLECTIVIZATION

According to the computations of a Special Committee of the Soviet of People's Commissars, 112.7 million persons depended on rural economy in 1926–27 out of a total population of 148.1 million.[3] These were distributed among the several categories as follows (in thousands):

Proletariat: Total	4,713
Workers	4,374
Employees	339
Peasants: Total	108,010
Poor	21,106
Medium	81,045
Large	5,859
Total in rural economy	112,723

Only 3,615,000 persons living in rural areas, or slightly more than 3 percent of the rural population, were listed by the same source as depending upon handicrafts (without hired help) as their principal source of income. This population probably consisted almost exclusively of those engaged in what is called *kustarnye promysly*, or rural industry (processing of such materials as wood, iron, and wool), and probably did not include all of them. Most rural construction was probably performed by persons who gave rural economy as their principal occupation. National income from rural construction in 1926–27 was estimated at 532 million rubles, or almost 5 percent of the total income from rural economy.[4]

As noted above, the term rural economy then included forestry, fishing, and hunting. The national income from these pursuits in 1926–27 was estimated at 15.2 percent of the total income from rural economy.[5]

When allowance is made for those engaged in forestry, fishing, and hunting, as well as for those depending upon handicraft but not sorted out by the statistics, only 100 million or so remain to be classed as engaged in agriculture proper. Even this total includes a great number for whom agriculture was only a subsidiary source of income. While the evidence is inadequate for estimating the population employed in agriculture on an approximately full-time basis, it is reasonably safe to assume that it numbered far below 100 million—probably not much more than 90 million—in 1926–27.

According to Babynin, there was a decline in rural population of 700,000 from the end of 1926 (census) to the beginning of 1929.[6] Lorimer assumed

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word is interpreted to mean rural economy in one case, agriculture in another. This reservation applies also to other parts of the study.

[3] *Statistical Handbook USSR, 1928*, Central Statistical Board (Moscow, 1929), pp. 42–43.

[4] *Control Figures of the National Economy USSR for 1928–29*, Gosplan (Moscow, 1929), p. 436. [5] *Ibid.*

[6] B. Babynin, "The Labor Resources of the Kolkhozy and Their Utilization," *Problems of Economics*, February 1940, p. 68.

that there was no appreciable change in the size of the farm population between December 17, 1926 and the year 1928.[7]

AFTER COLLECTIVIZATION

The most recent official statement on the occupational distribution of the population in 1939 appeared in *Izvestiya*, April 29, 1942. It is compared in Table 56 with similar data for 1937, published in a highly authoritative article in *Pravda*, June 2, 1939. This article also contained, and indeed represented an official comment on, the results of the new 1939 census of population.

TABLE 56.—POPULATION OF THE USSR BY "CLASSES," 1937 AND 1939
(*Percent of total*)

Class	1937[a]	1939[b]
Workers, urban and rural	....	32.19
Employees, urban and rural	....	17.54
Subtotal A	34.7	49.73
Collective peasants	....	44.61
Individual peasants	....	1.78
Subtotal B	....	46.39
Co-operative handicraft	....	2.29
Non-co-operative handicraft	....	0.82
Subtotal C	....	3.11
Collective peasants and handicraft	55.3	
Individual peasants and handicraft	5.6	
Subtotals B and C	60.9	49.50
Non-workers	....	0.04
Social grouping unidentified	....	0.73
Subtotal D	....	0.77
Other population (students, army, people receiving retirement, etc.)	4.2	
Total	100.0	100.00

[a] *Pravda*, June 2, 1939. [b] *Izvestiya*, Apr. 29, 1942.

According to the *Izvestiya* data (column 2), 44.61 percent of Soviet people were collective peasants in 1939, and 1.78 percent were individual peasants. Of the total Soviet population of 170.5 million, these percentages represented 76.1 million[8] and 3.2 million persons respectively. Employees

[7] Lorimer, *op. cit.*, p. 109.

[8] In several sources a figure of 75.6 million is mentioned, e.g., S. Sulkevich, *Territory and Population of USSR* (Moscow, 1940), p. 26; D. Shepilov, *Socialist Kolkhoz Property* (Moscow, 1940), p. 97. But this corresponds to a total population of 169.5 million rather than 170.5 million, the complete total of the census.

and workers of the MTS and sovkhozy can be estimated at 6.1 million.[9] Thus, according to these data, the population engaged in agriculture totaled 85.2 million in 1939. This computation will be referred to as Variant B to correspond with Lorimer's Assumption B.

The *Pravda* data (Table 56, column 1) obviously indicates a much higher agricultural population. In this it is supported, specifically for 1939, by other authoritative evidence. Varga, a prominent official Soviet economist, put the proportion engaged in rural economy in 1939 at approximately 58 percent.[10] This percentage would represent 99 million persons engaged in rural economy, and implies approximately 90 million in agriculture proper. Markus, editor of *Problems of Economics*, was obviously referring to the same figure as Varga when he said: "A little less than 60 percent of the adult population is engaged in rural economy."[11] Both authors certainly had access to the material of the 1939 census.[12] The statement made in *Izvestiya* in 1942 also appears to be authoritative. Since the statements pertaining to both 1937 and 1939 must be regarded as official, it is likely that the occupational grouping was changed between 1939 and 1942, and that this change is responsible for the considerable discrepancy between the two sets of figures.

An official dictionary distinguishes four categories of kolkhozy households or peasants:[13] (*a*) list numbers of kolkhoz households; (*b*) kolkhoz households on hand; (*c*) kolkhoz population on hand; and (*d*) working population of the kolkhozy on hand.[14] The explanation of the discrepancy between the authoritative statements made in 1939 and 1942 may lie in the difference between category *a* and categories *b* and *c*. The statements made in 1939 were apparently based on the list number of kolkhozniki, while the statement of 1942 was based on the "kolkhoz population on hand."

Lorimer's computation of the population engaged in rural economy in 1939 and the writer's computation of the population engaged in agriculture in the same year, designated Variant B, are likewise based on the kolkhoz population "on hand." A second computation of the population engaged in agriculture can obviously be made, based on the list number of kolkhoz households. It is here designated Variant A, paralleling Lorimer's Assumption A. There were about 19 million kolkhoz households at the time of the 1939 census and about 1 million individual peasant households. There were, furthermore, 4.38 persons per kolkhoz household before Russia's entrance into the war, probably in 1939, according to such an authority as Laptev.[15]

[9] Lorimer, *op. cit.*, p. 228.

[10] E. S. Varga, "The Basic Economic Problem of the USSR," *Courier of the Academy of Sciences of the USSR*, 1939, IX, 6th issue, p. 8.

[11] B. L. Markus, "Basic Problems of the Labor Organization in the 3d Five-Year Plan," *Problems of Economics*, March 1939, p. 157.

[12] Varga's article was not published until August 1939. The March issue in which Markus' article appeared was not published before June of the same year. The results of the census were released on June 2, 1939.

[13] *Dictionary-Handbook on Social-Economic Statistics*, Gosplan (Moscow, 1944), p. 128.

[14] Kolkhoz peasants who are away for a few days (at market or the mill) are counted as on hand.

[15] I. Laptev, "The Kolkhoz System and the Strengthening of the Military Might of the USSR," *Socialist Agriculture*, August 1943, p. 12. There seems to be some confusion in Lorimer's computation of the average number of persons per peasant household. He assumed (*op. cit.*, p. 229) that this average was 4.5 in 1926–28 and declined to 4.05 by

Thus, there were 87.6 million collectivized and individual peasants in 1939. When 6.1 million are added for those employed by the MTS and sovkhozy, a total of 93.7 million is obtained. This figure is reduced to 92 million to exclude duplications (Variant A). If the population engaged in forestry, fishing, and hunting is added to that figure, the total of close to 100 million, indicated by both Varga and Markus, is obtained. This cannot be merely a coincidence.

1939 COMPARED WITH 1926–27

To obtain the 1926–27 counterpart of Variant A, 1939, for population engaged in agriculture, the population engaged in forestry, fishing, and hunting, and the non-segregated handicraft workers, are subtracted from the total of 112.7 million engaged in rural economy. This subtraction leaves 100 million or slightly more, as compared with 92 million in 1939, and indicates a decline of about 10 percent during the 12-year period.

The second computation (Variant B) yielded 85.2 million as the population engaged in agriculture in 1939. The number engaged in agriculture on an approximately full-time basis may have been even less than that, possibly only slightly over 80 million. The counterpart of this figure in 1926–27 is far below 100, probably not much more than 90 million (see p. 710). Hence, the decline between 1926–27 and 1939 in the population engaged in agriculture on an approximately full-time basis appears to be 12½ to 15 percent.[16]

The proportion of persons from fifteen to fifty-nine years in the whole population increased by 3.4 percent between the two censuses. Hence the

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1939. The figure of 4.05 he obtained by applying the commonly published number of kolkhoz households, which was apparently the *list number of kolkhoz households*, to 76.1 million people, a population figure probably representing the number of *kolkhoz members on hand*. The number of persons per peasant household was around 5 in 1926–27 (*Statistical Handbook USSR, 1928*, pp. 42–43 and 82–83). Official data on the distribution of kolkhoz grain per household and per kolkhoznik in 1933 and 1934 (*National-Economic Plan for 1935*, Gosplan, 2d ed., Moscow, 1935, p. 227), implied an average of 4.22 persons per household. As stated, the average was 4.38 before the USSR entered the war, probably in 1939. It is shown in chapter xvii, p. 412, that approximately the same increase is implied in the official data on the number of trudodni (work units) per household and per person in 1932 and 1937. The large decline and the moderate subsequent recovery in the number of persons per household seem to be in close agreement with the economic changes as well as with the changes in the birth rate over the period.

[16] One would like to use the data on the change in rural population as additional evidence for the present analysis. After all, rural population consists primarily of population engaged in agriculture, and under normal conditions the residual rural population could be estimated with considerable certainty. This, however, is impossible owing to the inability of the writer to estimate the number of persons in those concentration camps which were located in rural areas. It is one of the shortcomings of Lorimer's book that the phrase "concentration camp" does not occur in it. Whatever the number of persons in concentration camps in 1939 may have been, it was sufficiently large for readers to expect that a book the size of Lorimer's would attempt to determine whether or not the concentration camps' inmates were included in the total population; if so, how many of them were included under rural and how many under urban population, and whether or not they were included in the labor force. The absence of answers to these questions makes unusable other essential data in Lorimer's book. If concentration camps could not have been discussed in a book published under the auspices of the League of Nations, it should have been published otherwise. There are other points worth discussing, which Lorimer omitted or disguised, apparently owing to political considerations. Lorimer would do well to publish a supplement to his book, to deal with such points.

number of gainfully employed in agriculture declined less than the whole population engaged in or dependent on agriculture. A decline of roughly 10 percent in the gainfully employed seems a reasonable assumption. The same figure holds for the period 1928 to 1939.

NOTE B

INVESTMENT

Relevant Soviet statistical publications give a prominent place to the investment in agriculture—excluding land[1]—and to the yearly additions to it.[2] The reader cannot fail to be impressed by the immense size of both and especially the large increases from year to year. However, perhaps because the facts are by no means as roseate as might be desired, the data on the total investment and the yearly investment are presented more and more in such form as to make measurements and comparisons impossible. The latest data on investment—those for 1938—are expressed in accounting rubles of varying and unknown value, and, moreover, are presented without any deduction for depreciation.[3] Even where earlier data are given in rubles at 1926–27 prices,[4] goods that were not produced in 1926–27 (and some others as well) are entered at high, and frequently fantastic, prices. The 1926–27 prices of tractors are perhaps three times, and those of trucks and automobiles five to six times, as much as would be reasonable (see Appendix Note C).

Even the basic question whether or not the total investment in agriculture increased during the 'thirties cannot be answered with any approach to precision. The investment in *rural economy as a whole* in 1927–28 was put at 17.8 billion 1925–26 rubles, with depreciation allowed for.[5] Its original value may have been roughly double that figure. The investment in *socialized agriculture* only, at the beginning of 1938, was reported at 30.6 million accounting rubles, with depreciation not allowed for.[6]

The 17.8 billion-ruble investment in rural economy at the end of 1927–28 was distributed as follows (in billion 1926–27 rubles):[7]

Machinery and tools	2.7
Tractors	0.05
Vehicles and small implements	1.59
Other machinery and tools	1.07
Buildings other than dwelling houses	5.3
Livestock, poultry, and beehives	9.0
Land improvements	0.8
Total	17.8

[1] Land was declared common property in the Revolution. Although it later became state property, it continued to occupy a separate place in Soviet philosophy (pp. 151 ff.).

[2] *Socialist Construction USSR, 1936; Socialist Construction USSR, 1933–38; Socialist Agriculture USSR, 1938.* [3] *Socialist Agriculture USSR, 1938*, pp. 22 and others.

[4] In *Socialist Construction USSR, 1936*, pp. 238–41, the data on total investment are in 1926–27 rubles with depreciation considered, but the data on the yearly additions to the investment are in rubles of the respective years, without allowance for depreciation.

[5] *Control Figures of the National Economy USSR for 1929–30*, Gosplan (Moscow, 1930), pp. 446–48.

[6] *Socialist Agriculture USSR, 1938*, p. 22. Includes the value of certain enterprises not strictly agricultural. [7] *Control Figures . . . . for 1929–30*, pp. 446–48.

A figure of 18.1 million 1926–27 rubles was given as the investment in the means of production in agriculture in 1932.[8] This represents too great an overvaluation to be comparable with the above data for 1927–28. The real value of the means of production in agriculture probably declined considerably more than one-third, and possibly as much as one-half, during the 1st Plan Period.[9] The greatest drop in investment was in livestock, but that in buildings likewise diminished considerably. There was probably also a decline in the investment in machinery and implements. This statement is made in spite of the official assertion that the investment in machinery and implements increased to 4.2 billion 1926–27 rubles in 1932.[10] The overvaluation of the new machinery was probably larger than the difference between 4.2 billion 1926–27 rubles given as the investment in machinery in 1932 in the *2d Plan*, and 2.7 billion similar rubles given for 1927–28 in *Control Figures . . . . for 1929–30.*

There was a rapid increase in total investment after 1932, but the pre-collectivization level was probably not restored by 1938. The correctly assessed value of tractors in this year was much less than the value of the draft animals that had disappeared. The value of all means of transportation was also less, as was the value of the productive livestock. The total value of barns probably followed the decline in livestock; in any event it did not increase. The only definite increases over pre-collectivization values occurred in machinery other than tractors, and in administrative buildings and repair shops, but these could hardly have made up for the decline in other items.

Private sector.[11]—Practically all means of production in 1927–28 were privately owned; the socialized sector had little more than 100 million rubles worth of such funds. According to an official source, the investment in the means of production of the socialized sector early in 1933 was 11.1 billion 1926–27 rubles,[12] as against the investment of 18.1 billion 1926–27 rubles in all agriculture, given in the *2d Plan.* This evidence implies that the investment of the private sector was considerably below half of the total in 1932. Actually it may have been over half, since the means of production of the socialized sector were overvalued.

An official source stated that 96.3 percent of all means of agricultural production was socialized in 1936, 3.1 percent was owned by the kolkhozniki, and 0.6 percent by individual peasants.[13] To reach this distribution, it was

[8] *2d Plan*, I, 208.

[9] Highly misleading figures for the investment in agriculture excluding livestock and dwelling houses in various years are found in *2d Plan*, I, 428, and on pp. 44–45 of its Supplement. The figures given are 11,367 million 1933 rubles in 1932, as against only 1,916 million rubles in 1928—a sixfold increase in the face of a huge actual decline. The fact that livestock and dwelling houses were excluded from the computations is mentioned only in footnotes. The fact that the private sector was excluded was not mentioned anywhere, the title of the table being "Operating funds in replacement values (in million rubles at 1933 prices)." In five years of scrutinizing these figures, the writer has been unable to interpret them.

[10] *2d Plan*, I, 208.

[11] The official terminology is inconsistent in the use of the term "private sector" in agriculture. The property of collective members is sometimes considered private and sometimes included with the socialized property. It is considered private here.

[12] *Socialist Construction USSR, 1936*, pp. 238–39.

[13] *Socialist Agriculture USSR, 1938*, p. 5.

necessary to include the value of land and forests, items normally not included in Soviet official computations of the means of production. Furthermore, in order to arrive at this result, either the land and forests had to be appraised at very high prices, or the investment of the individual sector underestimated, or both expedients resorted to.

Of the total livestock, worth perhaps 6 billion 1926–27 rubles, a substantial part was still privately owned in 1938. The peasants must have had barns to accommodate that livestock. Even the small implements in 20 million households, most of which had a vegetable garden, totaled too large a sum to be neglected. All in all, the private sector in 1938 had an investment in agriculture of perhaps 5 billion 1926–27 rubles, which amounted to somewhat more than 25 percent of the total investment in agriculture. It was little more than one quarter of the pre-collectivization investment of the private sector, and may have represented a considerable decline from 1932. The large increase in the livestock owned by the private sector (which includes the kolkhozniki) probably did not offset the value of the machinery and buildings it lost through socialization, destruction, and disrepair.

Socialized sector.—The investment of the socialized sector is divided into strictly state property, belonging to the state farms and MTS, and the property of the kolkhozy. The investment of the kolkhozy, which, before the big collectivization drive, came largely from the treasury in the form of direct subsidies and credits, in later years consisted of property confiscated from the so-called kulaki, property formerly belonging to the kolkhoz peasants, and that accumulated in the kolkhozy themselves. The investment of the sovkhozy and MTS naturally originated in the treasury.

The investment of the socialized sector appears from official data to have made up more than half of the total in 1932. By 1938 it probably was close to three-quarters of the total.

If from 30,568 million accounting rubles—the 1938 total value of means of production of the socialized agriculture with no allowance for depreciation—the value of irrigation systems and other improvements is deducted, the balance was distributed as follows:

Sovkhozy	7,253
MTS	5,632
Kolkhozy	17,104

But the accounting rubles, like all other Soviet rubles, are such a poor measure that values based upon them do not give a correct picture even of the distribution of the investment of the socialized sector among the various socialist owner groups.

Like everything else, the investment in the MTS appears greatly exaggerated in the above data. Valued in accounting rubles (without depreciation) at 4.3 billion rubles in 1938, the investment in MTS may not have been worth 1½ billion rubles at prices comparable with the 1926–27 prices of other goods, and with depreciation considered. The vast power exerted through state ownership of machinery over the kolkhozy, the whole peasantry, and the distribution of their output, had actually been acquired with a very small investment.

According to the official data in Table 57, the investment in the MTS

trebled in 1933–36, while those of the sovkhozy and kolkhozy increased by only 52 and 32 percent respectively (1936 is the last year for which such data in 1926–27 rubles are available). The development in succeeding years proceeded along the same lines. That the investment of the MTS expanded so much more rapidly than that of the sovkhozy was due in part to the disappointing results of the sovkhoz activities, but in particular to the fact that a given investment of state funds in MTS resulted in deliveries to the state several times larger than could be obtained from the same investment in the sovkhozy. The return on the investment in MTS in terms of deliveries by the kolkhozy becomes particularly favorable, compared with the investment-delivery ratio of the sovkhozy, when it is considered that the funds invested in the MTS relative to those invested in the state farms, are actually much smaller than the official figures at 1926–27 prices indicate.

TABLE 57.—INVESTMENT IN SOCIALIZED AGRICULTURE BY OWNER GROUPS, 1928–36*

(*Million 1926–27 rubles*)

Beginning of year	Total	Sovkhozy	MTS	Kolkhozy
1928	1,290	236	...	65
1929	1,566	299	...	150
1930	2,357	473	15	550
1931	5,313	1,160	106	2,485
1932	10,125	2,352	384	5,705
1933	11,101	3,022	738	5,569
1934	12,645	3,607	1,202	5,950
1935	14,391	4,139	1,624	6,621
1936[a]	16,434	4,601	2,232	7,392

* *Socialist Construction USSR, 1936*, pp. 238–42, except for 1928, which is from *Agriculture USSR, 1935*, p. 195. As elsewhere, investment in dwelling houses and other items not serving production directly is not included. The total includes among other investments, that on irrigation and other improvements, which increased from 828 million rubles in 1928 to 1,553 million in 1935.

[a] Preliminary.

NOTE C

"UNCHANGEABLE 1926–27 PRICES" OF TRUCKS, AUTOMOBILES, AND TRACTORS

"Unchanged uniform prices of 1926–27" are generally used in the USSR to measure production and national income; the same practice previously applied to investment in agriculture. In those computations very high 1926–27 prices are put on goods of which production started after 1926–27. The exaggerating effect of this procedure on all indexes of economic wealth

need not be discussed here.[1] So far as farm products are concerned, the practice may involve the evaluation of such crops as rubber plants and castor seed, only recently introduced; but the value of these crops in 1926–27 rubles is merged with the value of other technical crops in the data available to the writer. It cannot be ascertained, therefore, whether or not those crops are overestimated, and if so, to what extent. However, 1926–27 prices do exist for such important investment items in agriculture as "automobiles"[2] and tractors, and they are certainly out of proportion to the 1926–27 prices of other goods, especially of farm products. An analysis of these prices here seems indispensable—to give an idea of the changes in investment in agriculture and in the national income from agriculture during the collectivization period, and to evaluate the payments of the kolkhozy for the services of the MTS.

TRUCKS AND AUTOMOBILES

In 1932–34, the years for which 1926–27 prices of trucks and automobiles are available, most Soviet-produced trucks and all the automobiles were reproductions of Fords. The data in Table 58 indicate an average price per truck and automobile of around 12,000 rubles. Allowing 20 percent for spare parts, not mentioned separately in the source, an average return to the factory of well over 9,000 rubles is obtained. Since the official rate of exchange was 1.94 rubles to the dollar in 1926–27, the indicated dollar return is over $4,500, indeed about $5,000 (the conversion at the official exchange rate seems fully justified for that time). Since the output in 1932 consisted almost exclusively of trucks, the data indicate that trucks were priced considerably higher than the average price and automobiles considerably less. It seems safe to assume that in Soviet statistics the average return per truck at 1926–27 prices was and still is at least 10,000 rubles, and that of a Ford car at least 5,000 rubles.

The return to the factory in the United States for a truck similar to the average of those produced in the USSR in 1932–34 was probably no more than $700 in 1926–27.[3] The return for the Ford car produced in 1932–34 would probably have been about $400 in the United States in 1926–27.[4]

Thus the Soviet-produced replicas of American trucks and cars were valued in the statistics of industrial production at six to seven times as much as their prototypes (of superior quality) cost in the United States. If it is granted that the Soviet Union cannot produce machines as cheaply as the United States, the overvaluation must still be five to six times.

[1] Naum Jasny, "Intricacies of Russian National Income Indexes," *Journal of Political Economy*, August 1947, LV, 299–322.

[2] Trucks and automobiles are combined in the USSR under the term "automobile." An automobile is a "passenger automobile" there, a truck a "freight automobile."

[3] The Bureau of Agricultural Economics of the U.S. Department of Agriculture was willing to supply the exact data only on the condition that it be shown the manuscript.

[4] The price of the Ford car from the dealer to the consumer (f.o.b. factory) was $456 in 1927 and less than in 1926 (*Statistical Abstract of the United States, 1930*, p. 326). The return to the factory, i.e., the price minus dealer's expenses and profits for the car was probably not much above $300. But the Ford car produced in the USSR in 1932–34 was a copy of a later model of the Ford car.

Very high 1926–27 prices were also placed on trucks in their official appraisal as items in the investment in agriculture, but these were not as high relatively as the "returns to the factory" used in estimating the value of industrial production. On January 1, 1936, socialized agriculture had 69,658 trucks and about 10,000 automobiles, officially valued at 543 million 1926–27 rubles, with depreciation subtracted, or almost 7,000 rubles per vehicle.[5] The machines must have been valued at about ten thousand 1926–27 rubles at retail when new.

TABLE 58.—OUTPUT OF MOTOR VEHICLES AND RETURNS TO FACTORIES, 1932–34*

A. AUTOMOBILES AND TRUCKS

Year	Output						Return to factory (*1926–27 prices*)	
	Total	Automobiles	Trucks				Total (*million rubles*)	Per vehicle (*rubles*)
			Total[a]	1.5-ton	2-ton	3-ton		
1932.....	23,879	34	23,845	7,477	15,149	...	336	14,070
1933.....	49,724	10,259	39,465	16,477	20,005	891	566	11,400
1934.....	72,472	17,110	55,362	32,186	.....	19,935	810	11,250

B. TRACTORS

Year	Output					Return to factory (*1926–27 prices*)	
	Total units[b]	Total in terms of 15-h.p. tractors	10-h.p. tractors	15-h.p. tractors	Crawlers	Total (*million rubles*)	Per vehicle[c] (*rubles*)
1932.....	50,640	50,366	2,505	45,932	488	279	5,539
1933.....	78,138	81,333	58	71,567	2,103	469	6,020
1934.....	94,452	116,783	2,680	80,680	10,605	676	5,790

* Data from *Socialist Construction USSR, 1936*, pp. 9, 10, 160, and 165. Only those years are given for which data on returns to the factory are available. Data on motorcycles are not included.

[a] Including sizes not listed here.

[b] Including a small number of rubber-tired tractors used for road transportation.

[c] In terms of units with 15 horsepower.

TRACTORS

In 1932–34 the Soviet tractor output consisted of reproductions of an outmoded Fordson, of the 15/30 and Farmall of the International Harvester Company, and of a "50" crawler of the Caterpillar Company, Peoria (see pp. 460–64 for details). The return to the factory per 15 horsepower tractor in 1926–27 prices was over 5,500 rubles in 1932–34 (Table 58) and no

[5] *Socialist Construction USSR, 1936*, pp. 238–39, 247, and 252.

discount for spare parts is needed in this case, because the returns to the factory for these is shown separately in the source. The return to the factory for a tractor with 15-drawbar horsepower in the United States was around $800 in 1927.[6] Consequently the Soviet tractors were overvalued about three times, if it is granted that the USSR could not produce them as cheaply as the United States.

As part of the investment in agriculture, tractors also were valued at less than as part of the industrial output. There were 435,100 tractors (in terms of 15-horsepower units) on farms on January 1, 1936, and these were valued (with depreciation deducted) at 1,288 million 1926–27 rubles, or at 2,960 rubles per tractor.[7] The price of a new machine may have been about five thousand 1926–27 rubles, but this was a retail price rather than the return to the factory.

There was, however, still a third price for tractors (and certainly of all other equipment), namely in current rubles. In view of the rapid inflation of the Soviet ruble, one would expect current prices to be much higher than those of 1926–27. However, a 15-horsepower tractor delivered to the purchaser cost only around thirty-five hundred current rubles in 1934.[8]

Thus the line of tractor prices in descending order was: (1) over fifty-five hundred 1926–27 rubles—return to the factory, used in computing the value of industrial production and national income in terms of 1926–27 prices; (2) about five thousand 1926–27 rubles—retail price, used in computing the investment in agriculture in terms of 1926–27 prices; and (3) thirty-five hundred current rubles—real retail price to sovkhozy and MTS in 1934.

The procurement price of wheat in 1926–27 was 107 kopeks per pood,[9] or 91 cents per bushel, in the USSR. The tractor as an item of investment, valued at about five thousand rubles, was thus equivalent to 5,500 bushels of wheat. Little more than one thousand bushels (at farm prices) were needed to buy the same tractor in the United States.[10]

The 1934 output of spare parts for tractors was valued at 145 million 1926–27 rubles.[11] On January 1, 1934, there were 210,900 tractors (equivalent to 213,280 units of 15-drawbar horsepower) on farms; some of these tractors were of foreign make, for which the spare parts were probably imported. Even disregarding this, the output of spare parts for each 15/30 tractor on farms was valued at 680 rubles or about $350. Their retail value would have been approximately $500. If the purchasers were really charged these prices, and the labor was valued proportionately, the yearly

[6] The wholesale price of a 10/20 tractor was $680 (*Statistical Abstract of the United States, 1930*, p. 326). Hence the wholesale price of a tractor with 15 horsepower was about $1,000; the wholesaler's margin can be accepted at about 20 percent.

[7] *Socialist Construction USSR, 1936*, pp. 238–39 and 249.

[8] See, for example, V. Zybin and M. Nazimov, "Planning of the Costs of Tractor Work in MTS," *Socialist Reconstruction of Agriculture*, May 1935, p. 51.

[9] *Control Figures of the National Economy USSR for 1928–29*, Gosplan (Moscow, 1929), p. 504.

[10] The average price of wheat received by the American producer was 121.7 cents per bushel for the 1926 crop and 119.0 cents for the 1927 crop.

[11] *Socialist Construction USSR, 1936*, p. 9.

repair cost for a tractor in the USSR would have been close to its purchase price in the United States, and may even have exceeded it.

CONCLUDING REMARKS

In our appraisal of tractors, trucks, and automobiles as items of the investment in agriculture in 1926–27 rubles, an average price of 2,500 rubles is assumed per vehicle (15-horsepower tractor, truck, and automobile). This price is about equivalent to American prices in that year for tractors, but higher for trucks, and perhaps twice as high for automobiles. The poorer quality of the Soviet machines is disregarded.

Even if the cost to the Soviet factory in 1926–27 was 10,000 rubles for a truck and 5,500 rubles for a tractor, owing to the small output in that year, there was no reason to continue using these prices after production had been organized on a large scale. Machines as expensive to produce as these have no place in a well-organized economy, capitalistic or socialistic.

NOTE D

AGRICULTURAL CO-OPERATIVES DURING THE NEP

Agricultural co-operatives attained considerable importance before the Revolution. At the beginning of 1917 there were 27,500 primary organizations with a membership of about twelve million. About half of the peasant households were drawn into the movement.[1] The funds of these co-operatives were estimated at the very substantial sum of one billion gold rubles.[2]

For peculiar reasons, the order of January 27, 1920 called for the liquidation of the agricultural co-operatives and the merging of their funds and membership into the consumers' co-operatives. The agricultural co-operatives were revived by the order of August 16, 1921, i.e., after the declaration of the NEP (New Economic Policy).

With government support to the co-operatives and the discouragement of private entrepreneurs even during the NEP, the restoration and further development of the agricultural co-operatives were rapid once they were again sanctioned. By January 1, 1922, 12,000 co-operatives were organized. Sadyrin estimated their number on October 1, 1924 at 33,000, with a membership of 2.5 million.[3] The number of co-operatives nearly doubled in the next two years, when 62,047 co-operatives were counted. The membership grew even more rapidly, to nearly 10 million on October 1, 1927. Following are official data on the number and membership of agricultural co-operatives, including kolkhozy, on that date:[4]

[1] P. Sadyrin in *Agriculture on the Path to Recovery* (Moscow, 1925), p. 714.

[2] *National Economy of Russia for 1921–22*, Yearbook of *Economic Life* (Moscow, 1923), p. 518.

[3] Sadyrin, *op. cit.*, pp. 714–15.

[4] *Statistical Handbook USSR, 1928*, Central Statistical Board (Moscow, 1929), pp. 785–93. Rural consumers' co-operatives were not included with the agricultural co-operatives.

Type of co-operative	Number		Membership (*thousand*)	
Total	....	70,271	....	9,888
Production co-operatives (kolkhozy)	....	18,325	....	311
Simple production co-operatives	....	28,222	....	1,269
Land improvement	6,109		774	
Machine-renting points	14,775		224	
Livestock co-operatives	3,217		157	
Seed co-operatives	1,673		64	
Others	2,448		50	
Supply and sale co-operatives	....	23,724	....	8,308
General	13,268		6,311	
Credit	11,284		6,120	
Without credit operations	1,984		190	
Mixed	336		90	
Specialized supply-sale co-operatives	10,120		1,907	
Dairy	6,304		1,122	
Insurance[a]	....	2	....	0.1

[a] Data for 1926.

The primary or local co-operatives were combined into raion (district), oblast, republic, and all-Russian unions. There were 333 such unions on January 1, 1923. Their number grew to 407 in 1927.

The editors of the 1925 study, *Agriculture on the Path to Recovery*, stated with regret: "The majority of the available data indicate that thus far the percentage participation in the agricultural co-operatives was larger in the higher groups of the village."[5] The complaint was made in a footnote to an article by Sadyrin, whose data did not support this conclusion. The extent of this natural phenomenon was in any case greatly exaggerated. The same complaints were also heard later and, indeed, they became more vociferous.[6]

NOTE E

KONTRAKTATSIYA DURING THE NEP

The kontraktatsiya is a purchase by the government for future delivery of an agricultural product not yet ready for the market. The distinction was made in the USSR between kontraktatsiya with an advance of part of the purchase price and those without. The first form was frequently accompanied by other inducements such as delivery of seed, fertilizer, grain, and other producer or consumer goods, discounts on the agricultural tax, and the like. Such inducements always had to be offered with the second form, when no advance payment was made.[1]

Provided the contracts were arranged sufficiently early, they could serve

[5] *Agriculture on the Path to Recovery*, p. 717.

[6] *Materials of an Investigation of the Development of Co-operative Peasant Economy, I*, Works of the Scientific-Research Institute of Agricultural Sciences, No. 37 (Moscow, 1928), p. xv.

[1] I. Kuznetsov, "Preliminary Results of Spring-Crop Kontraktatsiya in RSFSR," *Economic Review*, June 1929, p. 94.

not only to insure delivery of goods which would have been produced anyway, but also to induce expansion of production or, more frequently, the production of certain crops or animal products instead of others. Furthermore, the producers entering a contract frequently were required to follow certain production techniques. The kontraktatsiya was indeed increasingly looked upon as a means of organizing agricultural production according to plan.

The kontraktatsiya was not, however, used on a large scale before the end of the NEP. Kiselev wrote: "Until 1927–28 this method of organizing agricultural production functioned predominantly with reference to technical crops, mainly cotton and sugar beets, the kontraktatsiya of which took place in relatively small areas; this greatly facilitated its carrying through."[2]

In succeeding years the kontraktatsiya was expanded in a sweep. In 1927–28 it was applied to 6 million hectares of grain, to 3,190,300 hectares of other crops, and to a small quantity of raw materials of animal origin; in 1928–29 to 19.1 million hectares of grain and 4.6 million hectares of other crops. The goal for 1929–30 was 44.0 and 7.8 million hectares[3] respectively. It was increased further in succeeding years, but was rapidly changing its character from voluntary[4] or semi-voluntary to compulsory. The government in Moscow decided how much of each crop was to be contracted in the whole country and subdivided this quantity among the individual republics. These subdivided their total quotas among the oblasti which in turn subdivided theirs. So the process continued until each village had its quota and distributed it among the individual peasants or kolkhozy. However, anything even remotely suggesting voluntariness did not fit well into the farm organization that emerged from the collectivization drive. By the order of January 19, 1933, the kontraktatsiya of grain was formally abolished; most other products soon followed.[5]

NOTE F

WHEAT IN THE NON-CHERNOZEM ZONE

The wheat area in the vast non-Chernozem zone in 1928 amounted to only 345,000 hectares, of which 106,200 were in spring wheat. By order of the government and Party, the acreage was expanded to 2,730,000 hectares in 1937, of which 1,679,500 were in spring wheat and 1,050,000 in winter wheat.

The soils of the non-Chernozem zone are, at best, poorly adapted to wheat. Experience in other countries shows that such designations as "wheat soil" and "rye soil" are relevant only for a given span of time. Provided certain requirements are met, the heavier soil types prevailing in central and northern European Russia can grow wheat. By abundant applications of lime and fertilizer, those soils, if they are located in areas not too cold for winter wheat, can be made to yield more wheat than rye.

[2] S. Kiselev, "Kontraktatsiya of Grain Crops," *Economic Review*, January 1929, p. 54.

[3] *Control Figures of the National Economy USSR for 1929–30*, Gosplan (Moscow, 1930), p. 543.

[4] Those who are compelled by financial difficulties to sell their crop in advance do not act exactly voluntarily.

[5] See pp. 366–67.

But the conversion of rye soils into wheat soils has been a process extending over more than one thousand years even in the countries west of the USSR, where climatic conditions are more favorable for the exacting requirements of wheat than in the Soviet Union. In such countries as Germany, where the process has been under way for centuries, only a relatively small portion of the former rye soils became wheat soils. While recently all such processes have been greatly speeded up by the development of agricultural techniques, the process of converting rye soils into wheat soils has not been accelerated to such an extent that it can be accomplished overnight, as was ordered in the USSR. Moreover, the requirements for such a conversion—plenty of manure and, particularly, of lime—have remained unchanged. The great expansion of wheat acreage in the USSR, however, was ordered at the very time when the reduction in livestock had greatly diminished the supply of manure and not enough commercial fertilizer was available to substitute for it. Liming was done only on a negligible scale(see p. 500).

An additional handicap to the growing of wheat in the non-Chernozem zone is that except for the western part, the climate is too cold for winter wheat, though it is satisfactory for the hardy winter rye. The non-Chernozem zone must therefore grow a large proportion of its wheat as spring wheat, which does not yield as well as winter wheat and is, moreover, more exacting than the latter in its requirements as to quality of soil. On the average of 1936–38, winterkilling of wheat amounted to 26.3 percent in Kirov oblast, 16.5 percent in Mari ASSR, 44.0 percent in Sverdlov oblast, 48.8 percent in Udmurt ASSR, and 28.5 percent in Tatar ASSR.[1] Since winter rye does not do well in Siberia, the competitive position of wheat with rye is better there than in the eastern portion of the non-Chernozem zone of European Russia. In that area both wheat and rye must be grown as spring crops.

The data presented in Lapin's article show that the expansion of wheat acreage in the non-Chernozem zone came to an end in 1937, the years 1938 and 1939 showing no further gains. When by the decree of December 28, 1939 the kolkhozy were given some choice in the grain crops they grow, those in the non-Chernozem zone responded by replacing with oats part of the spring wheat planned for them, and part of the planned winter wheat with winter rye,[2] although in this action they were handicapped by the obligation to deliver to the government all the wheat required of them in the 1940 delivery plan.[3] The following figures on wheat areas in 1938 and 1940 show the effect of the new order (in thousand hectares):[4]

Oblast	1938	1940
Gorki	263.8	204.0
Kirov	120.8	109.9
Leningrad	152.1	110.4
Moscow	106.3	74.2

[1] M. Lapin, "Results and Future of the Northern Penetration of Wheat," *Socialist Agriculture*, June 1939, pp. 71–72.

[2] See M. Moiseev, "Certain Results of the New Regulations as to Planning of Grain Crops," *Socialist Agriculture*, July 1940, pp. 23–24.

[3] Wheat was not replaceable by any other crop in obligatory deliveries to the government.

[4] S. F. Demidov, "Socialist Agriculture," *Socialist Agriculture*, February 1942, p. 21.

NOTE C

METHODS OF ESTIMATING CROPS

At least three more or less fundamental changes have occurred in Soviet grain crop statistics since World War I. The use of unadjusted figures for comparisons inevitably leads to wrong conclusions. Especially misleading are comparisons of the official estimates of the grain crops of 1933 and later years with those before the Revolution. While the later data are considerably higher than the actual yields, the earlier were materially below. The officially estimated crops of 1933 through 1939 are exaggerated by almost 50 percent, as compared with the official estimates of the crops prior to 1917.

The methods of estimating the non-grain crops were fundamentally changed only once—in 1939. The data for the various years before 1939 are, nevertheless, not always fully comparable.

PRE-REVOLUTIONARY STATISTICS

Before the Revolution, Russia possessed three types of crop statistics, but only the statistics of the Central Statistical Committee attached to the Ministry of Interior were complete and considered fully official. This Committee obtained its data from the lowest administrative units. In Petrograd the incoming figures were added and published, with little concern as to whether they made sense or not.

The Bureau of Agricultural Economy and Agricultural Statistics of the Ministry of Agriculture published yield data of its own, based on reports of voluntary correspondents. But the number of these was limited, and they were not fully representative of all producer groups. The Bureau itself in its yearbook[1] gave the estimates of the Central Statistical Committee for acreages and production, and its own estimates of yields per unit of area.

The third type of crop statistics was that of the zemstvo[2] statistical offices. This was very diversified material, collected only in some of the provinces, by various methods—mostly from voluntary correspondents—and being of varying degrees of comprehensiveness, frequently dealing only with yields. Along with the production data, some of these offices collected data on grain consumption also, but these, unfortunately, were usually restricted to the uses for human consumption and for seed. The data were generally good and frequently excellent, so far as they went.

The estimates of grain production by the Central Statistical Committee were known to have been underestimates. Indeed, its data on both acreages and yields were believed to have been too low. The techniques of checking the crop statistics by way of crop disposition, which seem so simple now, had not been developed. The crop statistics of the Central Statistical Committee were therefore attacked for incomplete coverage of the total acreage and for too conservative estimates of the yields by the lowest administrative offices. However, the writer knew personally some of those who played a

[1] *Recuil de Données-Statistiques et Économiques sur l'Industrie Agricole en Russie et dans les Pays Étrangers.* Ten editions; last edition, 1917.

[2] Zemstva were the self-governing organizations of the provinces (gubernii) and districts (uezdy).

decisive role in bringing about a revision of the pre-1917 statistics, and there is no doubt in his mind that those experts would have been less confident in their repudiation of the statistics of the Central Statistical Committee if they had not been certain that considerably more grain was actually used than was shown in the official publications.

Ivantsov, whose study,[3] written on the initiative of V. G. Groman, is the standard work among those who advocated revision of Czarist statistics, arrived at the conclusion that both the acreage and yield needed upward revision by 9 percent, and the production correspondingly by 19 percent.

So far as the utilization of crops can be ascertained with reasonable certainty, there is no better way of establishing the crops themselves. Since it is possible to account for considerably more grain used than was shown by the estimates of the Central Statistical Committee, there is no need to discuss the technical shortcomings of the statistical methods applied by the Committee.

The 1909–13 grain production of the territory later embraced by the Soviet Union averaged about 65 million tons, according to the Central Statistical Committee. As revised in accordance with Ivantsov's findings, the trend value for 1913 was estimated by the Gosplan to have been 81.6 million tons. Our analysis of the disposition of the crops in 1909–13 in Appendix Note J leads to the conclusion that the average 1909–13 grain crop was at least as large as this.

Similar results are obtained by an analysis of the production and utilization of bread grain (wheat and rye), which represents about 60 percent of the total grain production. Errors in data on the use of grain for feed—the most uncertain item in the computation of utilization in pre-Revolutionary years—affect the conclusions reached for bread grain to a much smaller degree than those for all grain. As in the case of all grain, the analysis of the data for bread grain points to a considerably higher total utilization than the estimates of the Central Statistical Committee show for production.

Another illuminating example of the inability of the Central Statistical Committee to register the facts correctly is its data on the distribution of acreage between winter and spring wheat. Winter wheat was replacing spring wheat in southwestern Russia in the last two decades before World War I. The data of the Committee reflected this shift with a considerable lag. For example, its estimate for Kherson and Taurien combined put the areas in winter and spring wheat at 1,121,000 hectares and 1,828,000 hectares respectively in 1913. The more reliable data of the 1916 census showed 41 percent more land in winter wheat and 71 percent less in spring wheat.

In spite of the almost general recognition of the inadequacy of the statistics of the Central Statistical Committee, they remained the only fully official ones until the very end of the Czarist regime. But their fate was sealed as soon as this regime was overthrown, for the Ministry of Interior was one of its bulwarks. With the Ministry, the Central Statistical Committee also passed into oblivion. The Gosplan gave official status to

[3] D. N. Ivantsov, *To the Criticism of Russian Crop Statistics* (Petrograd, 1915). See the criticism by N. M. Vinogradova, "Russian Crop Statistics," *The Statistical Courier*, 1925, XXIII, 29–84, and 1926, XXIV, 51–104.

the revisions suggested by Ivantsov. It is noteworthy that in this approval the Gosplan's two principal offices—the one headed by V. G. Groman, the other by S. Strumilin, a Party member—concurred. Strumilin, indeed, was the one who came out in print in favor of the revision. The new Central Statistical Board was somewhat more conservative, and was inclined to accept a 15 percent increase in output as more likely to be correct.

The Central Statistical Committee's estimates for most crops other than grain continue to be used, but the figures for a few crops, notably hay, were discarded and were not replaced by others.

1920 THROUGH 1932

The most reliable statistics Russia ever possessed are those of about 1925 to 1929. As was mentioned in the Introduction, the right people were given a real chance and they did an excellent job. The same experts had also handled the statistics of the earlier post-Revolutionary years, but during and shortly after the Civil War their efforts were adversely affected by the strong tendency on the part of the producers to conceal the facts. The figures reported to Moscow had to be adjusted substantially upward, and such corrections can never be completely reliable. Furthermore, the collection of many important statistics, notably those on the output of animal products, but also on utilization, had been but recently introduced, and time was needed to overcome at least the major shortcomings.

The start of the collectivization drive was also the beginning of the end of reliable statistics in the USSR. Reasons for deterioration arose both outside and inside the statistical organizations. As Schiller[4] correctly remarks, one cannot expect to obtain reliable data from producers when one is at war with them, and the Soviet government was certainly at war with the producers at that time. But the statistical organizations themselves deteriorated greatly. In the late 'twenties or early 'thirties, most of the statisticians who had played prominent roles in the famous statistical organization of the zemstva either disappeared (as did Groman, Vishnevsky, Wolf, and many others) or, like Popov, chief of the Central Statistical Board, were deprived of all influence. A new generation of statisticians took their place, and the change was clearly reflected in the statistics released.

The official statistics show an increase in cropped plowland from 113.0 million hectares in 1928 to 136.3 million in 1931, in spite of a decline in farm power of about 20 percent (see Chart 26, p. 506). While part of the reported acreage may never have been sown, there are no indications that any effort was made to check on this. On the contrary, there was anxiety to use these data as a proof that the ambitious goals of the 1st Plan and its even more ambitious revisions were fulfilled. Some crop figures of those years are definitely overestimates. The analysis of grain utilization on pp. 550 ff. and in Appendix Note J leaves no doubt that the grain crops of 1931 and 1932 were overestimated by at least 5 percent. Whether the overestimate was in yields or acreages cannot be ascertained. A discount must likewise be applied to the potato crop reported in 1932; the potato yields in certain other years also appear suspiciously high.

[4] Otto Schiller, *Die Landwirtschaftspolitik der Sowjets und ihre Ergebnisse* (Berlin, 1943), p. 118.

A concerted effort was begun to boost the achievements of the collectivization drive, relative to the pre-collectivization situation, by reducing the estimates for previous years. The official grain crop statistics of the immediate pre-collectivization period could not be touched, because they were supported by detailed utilization statistics made available in official publications. But the upward revision that had been made in pre-Revolutionary official estimates (pp. 725–26) was again reversed after it had been officially accepted for more than a decade,[5] and the estimates of the Central Statistical Committee were exhumed. No statistical evidence has ever been adduced in support of this step. The reversal is not accepted in this study. The figures of the Gosplan in the version before 1930, which are fully supported by the analysis of utilization in Appendix Note J, are used for pre-Revolutionary acreages, yields, and production.

The downward revision of the hay acreages and outputs of pre-collectivization years is discussed on pp. 613–14. A similar treatment of the meat output data is commented upon on pp. 643–44. In no case were the reasons for the revisions stated. One naturally becomes very suspicious, especially after not finding a single important case of an upward revision of an output figure or a downward revision of an expense figure.

BIOLOGICAL CROP: EARLY PERIOD

The new method of estimating grain crops.—The annals of Russian statistics will forever mark 1933 as the year of the break with the traditional method of crop estimating. For statistical purposes, actual or "barn" crops, to use the common Russian term, were replaced for grain by "biological" crops or crops "on the root"—estimates of crops never fully garnered. "Biological yields and crops" were the original terms; the terms "yields and crops on the root" and "factual crops" came into use later.

Originally the biological yield was thought of as the yield which *could be* obtained with careful harvesting. The actual procedure was to determine the probable yield in the field, frequently by threshing the crop of selected square meters. This later procedure is referred to as the "metrovka" or "sample sheaf." Anphilophiev described it as follows: "Along the diagonal of the plot, square meters are cut; the grain from these is threshed, weighed, and recalculated to the whole plot, and then to the hectare."[6] A deduction of up to 10 percent for subsequent losses from the biological crop thus determined was permitted[7] and apparently, for a time, commonly made.

In justification of the resort to the biological-crop estimates, it was pointed out that the usual method of estimating the harvested crops encouraged bad and, especially, delayed harvesting; and since deliveries to the government were partly dependent upon the size of the crop, these deliveries were reduced by negligent harvesting practices. Subsequent theft

[5] The revised figures can still be found in the third edition of the *1st Plan* (I, 144), published in 1930.

[6] A. Anphilophiev, "The Simplest Method of Estimating the Yield on 'Squad Plots,'" *Socialist Agriculture*, July 1940, p. 58. For a more detailed description of the "metrovka" see S. V. Sholts, *Course of Agricultural Statistics* (Moscow, 1945), pp. 40–49.

[7] N. Ossinsky, *Izvestiya*, Sept. 21, 1933. Ossinsky was in charge of crop statistics at that time.

of grain and its unauthorized utilization before the weight had been ascertained were given as further reasons for determining the yield in the field.[8]

Although according to official comments the new official crop estimates were expected to exceed the barn crops by the avoidable losses in harvesting, the actual differences proved considerably larger. In any event, the official yields became higher than the actual yields and this was equivalent, among other things, to an increase in obligatory deliveries and especially in payments for the services of the MTS. On the dubious assumption that the official figures on acreage of 1933 through 1936 were correct, and that consequently the whole overestimation of the crops was in yields, the analyses on pp. 543–46 and in Appendix Notes H, I, and J indicate that the barn yields averaged about 20 percent below official estimates during those four years.[9]

Harvesting losses and the difference between official and barn yields.—If the discount of 10 percent from the estimates in the field was made—as is generally assumed—and if the crop in the field was determined correctly, the difference between the official estimate and the barn crop should have been materially smaller than the total losses from field to barn. However, heavy as those losses were in the early and middle 'thirties, they seem to have been only slightly larger than the difference between the official and the (here-computed) barn yields in the middle 'thirties, and to have been no larger, or even slightly less, than this difference in the late 'thirties.

The heavy harvesting losses of those years naturally attracted much attention. Levitin, summarizing the results of numerous surveys in the kolkhozy for 1933 and 1934, arrived at the following percentage losses:[10]

Crop	1933	1934
Winter rye	21.0	16.4
Winter wheat	23.9	18.9
Spring wheat	33.3	27.0

A similar survey in 1935 indicated an average loss of slightly over 20 percent.[11] Losses on investigated sovkhozy averaged between 15 and 20 percent in 1934.[12] It is probable that losses on the land of individual peasants were smaller than in the kolkhozy and possibly even than in the sovkhozy. Hence the losses for all producers were probably moderately above 20 percent in 1933, declining to around 20 percent in 1934, and possibly to slightly below 20 percent in 1936.

[8] See Sholts, *op. cit.*, p. 34.

[9] The estimates of the 1933–35 crops by Otto Schiller, who was fortunate enough to have been an eye witness (see page 545), implied the following percentage discounts from official estimates to barn-crop status:

1933	27.6–33.2
1934	21.7–27.3
1935	20.1

[10] I. Levitin, "Certain Results and Future Tasks in Combating Losses, *Plan*, October 1935, p. 23.

[11] I. Levitin, "Elimination of Harvesting Losses of Grain—The Most Important Means of Combat for a Large Crop," *Socialist Reconstruction of Agriculture*, May 1937, pp. 91–92.

[12] I. Levitin, "Raising the Yield of Grain and Computing Losses When Harvesting with Combines on State Farms," *Plan*, May 1935, p. 15.

With such losses, the barn crops could not possibly be fully 20 percent below the officially released figures, if those figures were given officially as 10 percent below the determinations in the field. The conclusion must be made, therefore, that the determinations of the crops in the field were overestimates. This is not surprising, considering the uncertainties inherent in this method, as well as the general tendency of Soviet statistics toward overstatement.

BIOLOGICAL CROP: MATURE SYSTEM

Application to grain.—An increase in grain yields from the low point of the early collectivization years was to be expected. Draft power was becoming more plentiful, the kolkhozniki little by little were accepting their fate, and the complete disorder that prevailed in the kolkhozy in the first years of the drive was gradually replaced by organization of a sort. The increase in yields naturally had two sources. The crops in the field were improving, and harvesting losses, though still heavy, were declining as a result of more timely harvesting and, in areas to which it is adapted, of the increasing use of the combine.

Ironically, however, under the new system of estimating grain production, only the improvements in crops in the field could be reflected in the figures officially released. The very fact that the crops were estimated in the field prior to harvest prevented showing the achievement in gradual reductions in the huge harvesting losses. The desire must have been urgent to find a remedy. Since reverting to the old method was out of the question, the crop estimators had to depart even further from it. Once started, inflation calls for more inflation.

The solution was found in abolishing the previously permitted discount from the biological-yield estimates. It may not have seemed illogical to dispense with the allowances for harvesting losses after these declined from slightly over 20 percent to perhaps 15 percent. Since 1937 was the last year of the 2d Plan Period, it was only natural to select it as the time for new revision. The matter was simplified by another thorough shake-up of the statistical organizations. This was apparently the second one after the removal of Popov, the Chief of the Central Statistical Board.

On March 25, 1937, the Central Office of Economic Accounting of the Gosplan was entrusted with the job of determining the yield and output of crops, the establishment of the acreages having been assigned to the People's Commissariat of Agriculture. Sometime between that date and July 21, 1939, the Central Office of Economic Accounting issued an "Instruction on the Determination of the Grain Crops," which not only abolished all discounts from the ascertained crop in the field, but specifically prescribed that every precaution be taken to include in the estimates every kernel of grain that appeared on a stalk. Unfortunately the writer has been unable to locate the "Instruction." It is not in the official publications containing similar documents, and may indeed have been kept secret. But its existence and contents are obvious from the "Instruction on Determining the Harvests of Principal Technical Crops and Potatoes," dated July 21, 1939. Our analysis of the yields in chapter xxii makes it reasonably certain

that the instruction pertaining to grain was issued in time to be applied to the 1937 crop.[13]

The analysis in Appendix Note H indicates that the official estimates of the crops of 1937, 1938, and 1939 need discounts of 20, 20, and 23 percent respectively to bring them down to the barn-crop level. Thus about the same discounts were required for these years as were needed for the crops of 1933–36.

The complaints over large losses in the field continued unabated in the period now discussed. The very title of Levitin's article written early in 1937 ("Elimination of Harvesting Losses—The Most Important Means of Combat for a Large Crop") indicates that losses were still heavy. The government order of July 23, 1938, on "The Harvesting of the 1938 Crop," spoke of the large harvest losses in 1937. A discussion of the 1938 harvest mentioned that the "losses of grain in harvesting amounted to 2 to 3 quintals per hectare [about 20 to 30 percent] in many oblasti."[14] However, while Levitin's data for 1933 and 1934 (p. 729) pertained to general conditions, the complaints with reference to the 1937 and 1938 crops are more likely to have emphasized exceptionally poor harvesting practices. The average losses inevitably would have been reduced materially with the gradual restoration of more normal conditions in agricultural production, and they probably were well below 20 percent of the crops in the field. Since the needed discounts from the yields determined in the field were equal to around 20 percent, the overestimation of these yields even in the field continued also after 1936.

Application to other crops.—On July 21, 1939, the "Instruction on Determining the Harvests of the Principal Technical Crops and Potatoes" was issued. In substance, it prescribed for cotton, flax, hemp, sugar beets, sunflower seed, linseed, hempseed, castor beans, and potatoes that everything available in the field before the start of the harvest was to be included in the "factual crop." The following items, for example, were to be included in the "factual" harvest of seed cotton: (*a*) all cotton harvested; (*b*) cotton which fell on the ground; and (*c*) cotton which remained on the plant. With reference to sunflower seed, linseed, and hempseed, the following items were specified as components of the "factual" harvest: (*a*) the seed reported by the kolkhozy and sovkhozy as harvested; (*b*) the seed not accounted for in the reports of the kolkhozy and sovkhozy [i.e., concealed by them]; (*c*) all losses of seed from the time of ripening until the end of harvest—namely, seed which fell on the ground before and during harvest and in hauling, seed left in the field on the unharvested plants, in and between the cut stems, and seed stolen in the field. A similar enumeration included sugar beets and potatoes or their parts which remained in the ground.

The yields determined in the manner described are multiplied by the

[13] In its journal, *Planned Economy* (1939, 5th issue, p. 152), the Gosplan mentioned that at its meeting of May 8, 1939 it had approved an instruction to its statistical office on the estimating of grain crops and had presented it for final approval to the Economic Council at the Council of Commissars of the USSR. This instruction might after all have been the one that is here assumed to have been issued in 1937. The time of issue of the instruction does not, however, affect the writer's estimates of the barn crops of 1937 to 1939. They are made by means of interpreting certain statements of Soviet writers (see pp. 740–43).

[14] *Problems of Economics*, September 1940, p. 18.

acreages as finally established. The final determination of the acreages is made in the spring and any subsequent loss of acreage is disregarded.[14a]

The "Instruction on Determining the Harvests of the Principal Technical Crops and Potatoes" was published in a place which, although appropriate, is rarely consulted. The important change in the method of crop estimating was not mentioned in books, journals, and papers until 1944.

The "Instruction" on technical crops and potatoes did not state the first year of application of the new system. The ambiguous statement of the "Instruction"—"The Central Office of Economic Accounting of the Gosplan determines the size of the harvests of the principal technical crops and potatoes" in such and such a way—makes it seem possible that the regulation described had already been in use before July 21, 1939; but it seems more proper to interpret the statement as introducing something new, rather than elaborating on something existing. The crops harvested before 1939 would thus appear to be unaffected, but did the new regulations apply to the 1939 crop? The date of their release, July 21, is rather late in the season for a fundamental change in crop estimating. The regulations requested determination in the field, and some seed-flax was already harvested by that time. Of course, in view of other Soviet practices, it would not be surprising to see a fundamental change in statistics ordered in the middle of the harvest. The "Instruction" provides for a great deal of subsequent estimation anyway; later on, estimates could thus be made of the yield of seed-flax or any other crop as it had stood in the field at some previous time, although at the time of estimating the crop was already removed from it.

If sufficient data on the crops in 1939 and 1940 were available, together with reliable information on weather conditions, it would be possible to determine when the sudden jump in yield occurred that would necessarily accompany the change to crop determination in the field. Unfortunately, the few available data, most of which are presented in Table 59, do not permit definite conclusions. Still, the writer is inclined to assume that, except possibly for sunflower seed, 1940 rather than 1939 was the year when the new rules were first applied. Moreover, it seems not improbable that, owing to technical obstacles, the shift was not fully accomplished even in 1940. The new method may not have been applied in 1940 to certain crops at all or not all losses were included in the yields, estimated in on-the-root terms. The decision is particularly difficult because the losses involved in the various crops are not known.

The available data on the output of potatoes in 1939 do not necessarily imply an on-the-root figure. Since the 1938 potato crop was exceptionally poor, an increase of 60 percent over the 1938 level may well have occurred without a change in the method of estimating. Moreover, the 60 percent increase claimed by Molotov appears an exaggeration, when brought in relation to other evidence (see page 590, note 6). A further increase of 35.6 percent in the next year, claimed by Voznesenskii (Table 59), certainly implies a spurious increase. The yield of 10.9 tons per hectare in 1940, as given by Vintaikin,[15] when brought in relation to all previous data on potato yields, was undoubtedly an on-the-root yield.

[14a] *Dictionary-Handbook on Social-Economic Statistics*, Gosplan (Moscow, 1944), p. 90.

[15] Z. Vintaikin, "Location of Potato Growing in the USSR," *Socialist Agriculture*, December 1947, p. 29.

The sunflower-seed yield of 9.3 or 9.4 quintals in 1940 is likewise an on-the-root yield. Furthermore, if the increase-in-output figure of 13.2 percent between 1939 and 1940 may be taken as indicative also of the increase in yield, the resulting yield figure for the earlier year (8.2–8.3 quintals) is still so high that the possibility must be granted that the sunflower-seed yield was determined in on-the-root terms in 1939.

TABLE 59.—YIELDS AND INCREASES IN OUTPUT OF SPECIFIED CROPS, 1937–40

Crop	1937	1938	1939	1940
	Yield in quintals per hectare			
Potatoes[a]	95.6	57.0	...	...
Sugar beets	183.0[a]	141.0[a]	177.0[a]	171.0[b]
Cotton fiber[a]	4.0	4.0	4.2	3.8
Sunflower seed	6.4	...	...	9.3 to 9.4[c]

	Increase in output (percent)	
	1938 to 1939	1939 to 1940
Potatoes	60[d]	35.6[e]
Sugar beets	...	18.6[e]
Sunflower seed	...	13.2[e]

[a] *International Yearbook of Agricultural Statistics, 1940–41.* (Rome, 1941).

[b] N. Anisimov, *Agriculture in the New Stalin Five-Year Period* (Moscow, 1946), p. 43.

[c] The figure 9.3 is given by S. F. Demidov, in *Development of Agriculture in the Postwar Five-Year Period* (Moscow, 1946), p. 46. The yield of 9.43 quintals is implied in the acreage and production figures given by Anisimov, *op. cit.*, p. 48.

[d] Molotov's speech to the Moscow Soviet on Nov. 6, 1936.

[e] N. A. Voznesenskii, "Economic Results, 1940, and Plan of Development of the National Economy USSR in 1941": Report to the XVIIIth All-Union Conference of the CPSU(B), printed in *Pravda*, Feb. 19, 1941, and reproduced in the leader in *Socialist Agriculture*, January-February 1945, p. 4.

On the other hand, the 1939 sugar-beet yield of 17.7 tons per hectare, although high, might still have been an actual rather than an on-the-root yield. The data on the sugar-beet yield and output in 1940 are obviously contradictory. Voznesenskii's figure indicates an on-the-root crop, while that of Anisimov may have been either an actual or an on-the-root yield. Both the yield of 17.7 tons for 1939 and of 17.1 tons for 1940 may also have been on the root but with losses, actual or accounted, possibly not as high as those implied in the official prewar yields of grain. The yield of cotton fiber as given in the *International Yearbook* . . . . (Table 59) is better disregarded. The yield of 15.1 quintals of seed cotton stated by Anisimov for irrigated cotton in 1940[16] (as against 14.3 quintals in 1937 and 14.9 quintals in 1938) might have been a barn yield, but more likely it was on the root with small actual or accounted losses. The same may have been true of the 1939 cotton yield.

[16] N. I. Anisimov, *Agriculture in the New Stalin Five-Year Period* (Moscow, 1946), p. 41.

No figure for the 1939 yield of flax is available. The 1940 yield of 2.7 quintals[17] does not indicate much tampering, unless the labor shortage affected this crop particularly strongly.

The reader may well feel that the results of all this groping in the dark are not very illuminating. If, as is likely, the determination by the new method of the yields of potatoes and of some technical crops occurred for the first time in 1940, the following cynicism seems worth expressing. In reproducing Voznesenskii's data on the increase in yields from 1939 to 1940, the leader in *Socialist Agriculture* praised these increases as achievements attained "in one year only." Uneatable and unusable crops can be grown overnight, on a piece of paper.

Soon after July 21, 1939, the method of determining the crops in the field prior to harvest, with no allowances for harvesting or other losses, was extended to all crops. The exact date is unknown, but 1944 publications spoke of this system as having pertained to all crops for some years. Hence the method is likely to have been made general as early as 1939 or 1940.

Some purposes for which the biological-crop estimates are used and not used.—As used in the USSR, the biological-crop method would be unacceptable even if it were, in itself, superior to the method used in the Soviet Union before 1933 and still used elsewhere. The biological yields and crops, significantly having the qualification "factual" in the official definition, are higher than the barn yields and crops. This is recognized officially. Sholts writes: "The barn crop is smaller than the factual yield of the crops and the use of it leads to concealment."[18] Yet in the USSR the "factual" yields are treated as if they were actual yields. The government exacts payments from the kolkhozy depending upon the size of the estimated crops while increasing the estimates and thus making the peasants pay for ever larger amounts never harvested. The crops determined in the field are furthermore regularly compared, without any adjustments, with crops of previous years determined after threshing, and the conclusion is jubilantly drawn that the yields obtained by socialized agriculture are greatly superior to those obtained prior to collectivization,[19] or obtained elsewhere, specifically in the United States.[20] Yet around 1938, for example, the normal grain yields of the USSR within the boundaries of that year were actually only a few decimals higher than in 1909–13.

The on-the-root estimates are used furthermore in estimating gross agricultural production and national income from agriculture, thus distorting these measures and, even more, the commonly made comparisons with similar estimates for past years when only the real outputs were considered.

While the biological yields and crops are used for statistical purposes, the biological yield is rejected as a basis for the payment of workers, whose pay depends on the outturn of the crop. Anphilophiev dismisses it as a basis for computing the payment of tractor drivers and combine operators. After describing the "sample sheaf method" (see p. 728), this competent author

[17] Anisimov, *op. cit.*, p. 46.

[18] Sholts, *op. cit.*, p. 34.

[19] See the reproduction of Russian statistical tables on p. 11.

[20] See *USSR and the Capitalist Countries* (Moscow, 1939), pp. 250, 253, 256, 259, and others. The quoted publication is the official source on the relation of the Soviet economy to the outer world "for economists, scholars, students and agitators" (1st ed., under the title *USSR and the Capitalist World*, Moscow, 1934, p. 2).

writes: "This method has several drawbacks, the principal of which are arbitrariness and high outlay of labor. Besides, by this method only the biological yield is obtained which very frequently differs greatly from the actual yield."[21] Even more revealing is the discussion of the methods of payment of labor in the kolkhozy by Chuvikov,[22] who makes it quite clear that because of the shortcomings of the "sample sheaf method" it is not even considered as a basis of payment to workers. In those cases when, for the computation of payment to workers, the harvest is determined in the field by some other method, this determination is considered only preliminary. Later its results are corrected on the basis of threshing returns.[23]

Conclusion.—That the biological-crop method is inadequate is proved by the evidence of every country in the world. Estimates of the unharvested crops rarely are correct, although allowances for probable harvesting losses are always made. The inadequacy of the method is also recognized in the USSR itself, as is obvious from the fact that it is believed unacceptable as the basis for establishing payments to workers. Adherence to this method and its continual expansion imply that correct crop estimates are not the end sought.

Crop estimating in the USSR was becoming more and more an arbitrary procedure performed in great secrecy and without the possibility of any direct check. The "metrovka," a very inaccurate but still objective method, was playing an ever smaller role. In the "Instruction" of 1939 it is mentioned only in the case of sugar beets, and even for the determination of this crop it was not obligatory. As to fibers, for example, the prescribed procedure was to add to the crop delivered to the government and that concealed by the producers, the loss in all phases of harvesting as *estimated by experts*. The same experts certainly also estimated the concealed quantities.

An official publication of 1944, devoted to the methodology of estimating economic and social phenomena, defined the yields of crops as follows: "As yield or factual crop . . . . per hectare is accepted the harvest on the root, which is determined by sight appraisal, about one week before the start of the harvest. This appraisal is made for each crop once a year."[24] Sight appraisal—this was all. The system of complete arbitrariness was brought to its logical conclusion in 1942 when, by the decision of the government and Party of December 6, the Gosplan and the People's Commissariat of Agriculture were forbidden "to collect data on the threshing results in kolkhozy, as distorting the factual situation of the harvest."

From the very start of the application of biological-yield methods, a tendency could be observed toward overestimating even the crop available in the field. This tendency is likely to be strengthened. The 4th Plan asks for 26 million tons of sugar beets in 1950, which should yield some 3.1 million tons of raw sugar. Yet the goal for sugar production of the same Plan is only 2.4 million tons, and one can be certain that it is not intended to use the sugar beets for anything but sugar production, or to permit any

[21] A. Anphilophiev in *Socialist Agriculture*, July 1940, p. 58.

[22] V. Chuvikov in *Socialist Agriculture*, May 1940, pp. 17–18.

[23] The same evidence is contained in Yanyushkin's article on "Squad Organization of Work," *Socialist Agriculture*, March 1940, pp. 60–61.

[24] *Dictionary-Handbook on Social-Economic Statistics*, Gosplan (Moscow, 1944), p. 88.

other use. Thus a barn yield of sugar beets equal to about 76 percent of the on-the-root crop is indicated (see chapter xxiii).

Unfortunately for those who publish the on-the-root estimates, the crops thus determined do not feed, clothe, or serve any other useful purpose. The consumers have learned to appraise the official figures at their real worth, just as they know that a ruble which buys less than a pound of coarse rye bread is not a full-worthy ruble—the claim introduced in connection with the confiscation of most of the money in circulation late in 1947.

Recent changes.—The February 1947 decision of the Party ordered the organization of the state inspection on yields at the Gosplan. The Chief State Inspector acts through 420 interregional state inspections, independent of the local authorities. As is obvious from an article by Saveliev, the Chief State Inspector,[25] the measure was brought about by the considerable strengthening of the tendency of the local authorities to underestimate the crops. Combat with underestimates is the main task of the new inspection, according to Saveliev. The possibility of overestimates does not occur to him. No changes were made in the determination of what constitutes the "factual" yield. The "metrovka" had come to new glory. In spite of its shortcomings, it still is a kind of "objective" measure. The tendency to concealment is apparently so large that any objective measure, even the metrovka, becomes desirable to protect against concealment.

While one can only guess about recent developments, the writer feels that the grain crops of 1945 and 1946 may have been underestimated relative to the immediate prewar years. The 1945 barn crop of grain, for example, may well have been only 15 percent below the official figure. By contrast, the official 1947 grain crop—reportedly 58 percent above that of 1946—must probably be scaled down by at least 25 percent. A 58 percent increase in one year in the grain output of a country as large as the USSR simply cannot be credited. Much more than 10 percent of it may well be written off as due to the organizational changes under Mr. Saveliev.

NOTE II

ASCERTAINING THE BARN CROPS OF GRAIN, 1933–39

The barn crops of grain in the USSR can be ascertained with considerable certainty in the first seven of those years for which official statistics give only "biological" or "on-the-root" crops, with or without discount (see pages 728 ff. for a discussion of those terms). A good approach is by way of utilization. This is especially true of the period 1933–36 as a whole, because the average yearly accumulation of carryover in these four years was small and the average crop therefore was only slightly greater than the average direct utilization. The results are less exact for the crops of 1937–40. Still, the average of the crops of 1937 and 1938 exceeded the average yearly direct utilization by only a few million tons, i.e., by a fraction of the difference between the average crop as officially estimated and the average barn crop of those years. The analysis of the utilization of grain in 1933 to 1936, and

[25] B. Saveliev, *Socialist Agriculture*, July 11, 1947.

in 1938, the latter representing about the average of the crop years 1937–38 and 1938–39, can be found in Appendix Note J.

While considerable reliance may be placed in this method of ascertaining the barn crops, checks are always welcome. Such checks can be made in different ways or by different approaches. One such approach is through reconstruction of the barn crops from statements of official analysts. A number of institutions in the USSR are devoting special attention to the analysis of the work of collective and state farms. Their publications are too voluminous to be digested properly, especially since most Soviet publications are difficult to digest anyway. It is obvious that in dealing with the kolkhoz and sovkhoz economy, the analysts would be unable to reach useful conclusions if they used biological-crop data. One cannot eat, feed, or plant something that was not harvested. The data actually used by these analysts are certainly barn-yield data, but they are rarely included in the published statements.[1] Still, a writer must say something; hence resort is frequently made in such publications to relative figures, in the hope that the actual data cannot be reconstructed from them. Fortunately, the perspicacity of readers is misjudged. Such reconstruction of the grain crops is actually possible for all five years 1935–39, for which such statements have been made.

Analyses of the results of the activities of kolkhozy in 1937–38 through 1939–40, published by various Soviet writers,[2] contain the percentage distribution of the kolkhoz grain supplies by various items, such as obligatory deliveries to the government, seed, and feed (Table 60). Since for some of these items official or other reliable evidence on the amounts in tons is available, those percentages permit the reconstruction of the total amounts distributed by the collective farms. One easy step leads from these totals to the kolkhoz crops. By adding to these the available official figures on the barn crops of the sovkhozy as well as estimates of the small crops of the other producers, the total barn crops of the USSR in 1937 to 1939 are obtained.

One analyst, working on accounts of the collective farms, brought the barn crops of grain in 1937 into relation with those of 1935 and 1936. Another analyst did the same for grain yields in those years. Since the 1937 barn crop of the collective farms can be determined from Arina's data, the barn crops of the collective farms and the total crops of 1935 and 1936 can also be reconstructed.

For several reasons, partly unknown, the reconstruction of barn crops from the statements of official analysts does not yield absolutely exact results, but a good idea of the crops in the respective years is obtained nevertheless. Like the estimates of utilization, the results obtained by reconstruction leave not the slightest doubt that the barn crops of the respective years were much smaller than the official figures. The most complete data for reconstruction are available for the 1937 crop. The highest reconstructed figure for the barn

[1] Shimichev's and Kantyshev's data on the barn yields of the sovkhozy in certain years, utilized below (pp. 741–42), are the only more general ones of this kind that have come to the attention of the writer.

[2] Most consistently by A. Arina, in such official publications as *Izvestiya* and *Socialist Agriculture*. These data are referred to hereafter as Arina's data.

crop in this year that is compatible with Arina's data is 15 percent smaller than the officially released production figure.

Further opportunities for estimating the barn crops of the kolkhozy are offered by a combination of official data on procurements and on distributions

TABLE 60.—KOLKHOZ DISTRIBUTIONS AND USSR BARN CROPS OF GRAIN, 1937–38 to 1939–40

(*Quantities in million tons*)

A. KOLKHOZ DISTRIBUTIONS

Item	Percent of total distributions[a]			Computed amounts		
	1937–38	1938–39	1939–40	1937–38	1938–39	1939–40
Obligatory deliveries	12.2	15.0	14.3	10.5[b]	10.0	10.2
Payments to MTS	13.9	16.0	19.2	11.6[b]	10.7	13.7
Return of loans	1.5	2.0	4.0	1.2[b]	1.3	2.9
Sales to government and on market	4.8	5.1	4.0	3.9[c]	3.4	2.8
Seed and seed reserve	16.3	18.6	18.2	13.3[c]	12.4	13.0
Feed and feed reserve	12.7	13.6	13.9	10.4[c]	8.8	9.9
Distribution to members	35.9	26.9	22.9	29.3[c]	18.0	16.4
Reserve for assistance to members	1.1	.8	3.5	.9[c]	.5	2.5
Miscellaneous	1.6	2.5		1.3[c]	1.6	
Total	100	100	100	82.4	66.7[d]	71.4[e]

B. CALCULATION OF BARN CROPS

Kolkhoz distributions (from above)	82.4	66.7	71.4
Seed loans from government	.5	2.7	1.0
Kolkhoz crop accounted for	81.9	64.0	70.4
Theft and other unaccounted for	3.0	3.0	3.0
Total kolkhoz barn crop	84.9	67.0	73.4
Sovkhoz crop	8.6	7.3	7.3
Crop of other producers	2.4	1.6	1.5
Total USSR barn crop	95.9	75.9	82.2

[a] Data of A. Arina, from the following sources: 1937–38, "Equitable Distribution of Income in the Kolkhozy," *Socialist Agriculture*, Dec. 22, 1938; 1938–39, "Kolkhozy in 1938," *Socialist Agriculture*, December 1939, p. 63; and 1939–40, *Izvestiya*, Mar. 29, 1941.

[b] *Kolkhozy in the 2d Stalin Five-Year Period*, p. 95. Original figures increased by 3 percent (see text).

[c] See text for method of computation.

[d] Based on obligatory deliveries, estimated at 10 million tons (slightly less than in 1937–38, owing to poor crop), representing 15.0 percent of total distributions.

[e] Based on seed and seed reserve, estimated at 13.0 million tons, representing 18.2 percent of total distributions.

to the kolkhozniki with estimates of actual disappearance on other uses of the kolkhoz crop. The next step from the barn crop of the kolkhozy is again the total barn crop of the Union.

One approach supplements the other.[3] The most reliable picture can be obtained when all possible approaches are used simultaneously. But such detailed analysis would require more time than the writer has had. Since the reconstruction of the crops from statements of official analysts can be made most briefly, and since the approach seems to be the one least subject to doubt, it is the only one here undertaken in full.

RECONSTRUCTION FROM STATEMENTS OF OFFICIAL ANALYSTS

Crop of 1937.—An official study gives the following figures for grain procurements by the government from the kolkhozy in 1937 in terms of accounted weight (in thousand tons):[4]

Obligatory deliveries	10,169
Payments to MTS	11,234
Return of government loans	1,117
Total	22,520

The qualification "accounted weight" appears in this source for the first time, so far as the writer knows. Its meaning is not clear, but it may have been introduced in view of changes made in 1936 in regulations pertaining to the quality of grain delivered to the government. These regulations specified that only that grain which answered the minimum requirements as to quality was to be accepted at full weight. Deductions for foreign matter (apparently also grain admixture), and for moisture in excess of the minimum allowances, had to be in kind (Article 44 of the order).

No official data seem to be available on the amounts of grain delivered to offset discounts in addition to that shown in the record. This grain will be estimated at 3 percent for the crops beginning with 1936. If the delivered grain was at least up to the normal standard for Russia and elsewhere, the average discount in kind should not have amounted to more than this. If it did, the quantities additionally delivered replaced water and impurities rather than grain, i.e., worthless things.

A further question is whether the grain delivered to the government is entered into the accounts of the collective farms at the actual weights or at the weights recognized by the government. It will be assumed that the kolkhoz accounts show the actual (higher) weights. The following tabulation shows these three items of distribution in 1937, increased by 3 percent (thousand tons):

Obligatory deliveries	10,474
Payments to MTS	11,571
Return of government loans	1,151
Total	23,196

[3] An additional approach is the comparison of the revised grain yields with those of other major crops (see Appendix Note I).

[4] *Kolkhozy in the 2d Stalin Five-Year Period*, Gosplan (Moscow, 1939), p. 95.

For reasons unknown, these figures do not stand in the same percentage relationship to one another as do Arina's percentage figures (Table 60, col. 1). Thus, when the official quantity figures for obligatory deliveries, payments to MTS, and return of seed loans in 1937–38, raised by 3 percent, are each recalculated to 100 percent on the basis of the respective percentages given by Arina, a different figure for the total distribution is obtained in each case. Calculated from obligatory deliveries the total distribution would be 85.8 million tons, from payments to MTS, 83.2 million, and from return on loans, 76.7 million tons.

Still another figure for the total distribution of kolkhoz grain in 1937–38 is implied if the quantity of grain distributed to kolkhoz members is related to the percentage (35.9) given by Arina for this item. One source stated that an average of 17.4 quintals of grain was distributed from the 1937 crop to each kolkhoz household.[5] About 17.8 million households probably participated in the distribution in that year,[6] and the total distribution should have been 31 million tons.[7] If this figure represents 35.9 percent of the entire distribution of kolkhoz grain, the implied total is 86.3 million tons.

A test can be made also from data on seed requirements, which are not difficult to estimate with considerable accuracy. An average of 1.4 quintals per hectare is an adequate allowance; this provision should also cover resowing of normal winterkilled acreages. If the detailed regulations existing as to the amount of seed to be used for individual grains in each oblast were strictly complied with, the average per hectare would fall short of 1.4 quintals. At 1.4 quintals per hectare the total utilization for seeding the kolkhoz grain acreage in 1938 would have been 12,869,000 tons. Since 16.3 percent of all distributions in that year were used for seed according to Arina's data,[8] the indicated total distributions of kolkhoz grain in 1937 would be 78.9 million tons.

Thus the various reconstructed total distributions of grain by the kolkhozy in 1937–38 were as follows (million tons):

Basis of reconstruction	Total distribution
Obligatory deliveries	85.8
Payments to MTS	83.2
Return of loans	76.7
Distributions to kolkhozniki	86.3
Quantities allowed for seed	78.9
Average	81.7

It is rather difficult to make a choice among the various bases. The utilization for seed may have been somewhat larger than that estimated in the text, in

[5] *Kolkhozy in the 2d Stalin Five-year Period*, p. 110.

[6] The official figure is 18.5 million on July 1, 1937, but according to *Productivity and Utilization of Labor in the 2d Stalin Five-Year Period*, Gosplan (Moscow, 1939), p. 128, 3.83 percent of all investigated households were entirely absent from the collective farms covered by the 1937 survey.

[7] *Kolkhozy in the 2d Stalin Five-Year Period*, pp. 40 and 110, provides a check on this figure in its statement that an average of 4 kilograms of grain was distributed per trudoden (work unit) in that year, and that 7,893.4 million trudodni were performed.

[8] As is seen in Table 60, the investigations speak of "seed and seed reserve fund," but the latter functions only until the next crop is sown; any residual is then returned to the general supply.

which case, of course, the figure for total distribution derived from it was also larger. Part of the grain handed over to the kolkhoz members for the seeding of the kolkhoz fields is stolen by them. For the most part this would simply result in somewhat thinner seeding. But in some instances, in view of this theft, larger amounts of grain might have been allowed for the seeding operations. The figure obtained through the use of distributions to the kolkhozniki, on the other hand, may be too high. There is too much inclination in the USSR to present the distributions to the kolkhozniki in a favorable light. It may be somewhat arbitrary but the procedure here selected is to retain the official figures for obligatory deliveries, payments to MTS, and return of loans, increased by 3 percent, and to calculate the residual items from 81.7 million tons, the average total distribution suggested by all five items considered. This implies a total distribution slightly higher than the figure from which these items are computed. It furthermore implies that the total distributions to the kolkhozniki turn out somewhat below those implied in official statements per household and trudoden, while seed use (13.3 million tons) almost reaches the figure of 14 million allowed for the whole Union in 1938 in the analysis of grain utilization on page 756.

In the preceding discussion the totals were referred to as the total kolkhoz supplies or total distributions rather than as the total kolkhoz crops, because the total supplies consisted of the crop plus seed loans from the government, while the distribution included repayment of those loans. The fact that only small quantities were normally involved in such loans was the reason that Soviet writers spoke of the distribution of the kolkhoz *crops*. To arrive at the kolkhoz crop from total distribution, the loans obtained in that year have obviously to be deducted from the total supplies. For 1937, an exceptionally good crop year, the seed loans obtained by the kolkhozy from the government are here estimated at 500,000 tons.

Arina and others probably worked with figures entered in the accounts of the kolkhozy. Some grain is fed to livestock, and some is stolen, before the grain is weighed. In spite of the heavy penalties (death or at least 20 years' imprisonment), thefts are probably rather heavy under conditions whereby many of the nominal owners of the crop frequently do not get enough of the produce of their collective farms to feed their families. An allowance is made in the accounts for the unweighed grain fed to the kolkhoz livestock, but the date of the beginning of this practice is not known. Beginning with the 1937 crop, stolen grain had to be included in the crop estimates, but it presumably was not entered in the accounts of the kolkhozy. The kolkhoz grain which escaped accounting in 1937 is estimated at 3 million tons.[9] Thus the indicated total kolkhoz grain crop of 1937 becomes 85 million tons.[10]

Shimichev stated that the sovkhozy threshed 9.9 quintals per hectare in 1937.[11] But he also applied the same yield specifically to the sovkhozy of the Commissariat of sovkhozy, although there is reason to believe that the average yield in all sovkhozy was the higher. Kantyshev likewise ap-

[9] The stolen seed was in addition to this.

[10] There is no indication that in 1937 or any other year the kolkhozy carried substantial quantities of grain over into the next season.

[11] A. Shimichev, "Ways of Converting the Sovkhozy into Model Enterprises," *Socialist Agriculture*, July 1939, p. 45.

plied the same figure of 9.9 quintals to sovkhozy in general.[12] This is done here. The error, if any, cannot involve more than a few hundred thousand tons, because the sovkhozy of the Commissariat of Sovkhozy had most of the sovkhoz grain acreage. Also, the high yield of 9.9 quintals may have fitted the conditions in all sovkhozy (including koopkhozy) in that particular year. The grain acreage of all sovkhozy, including koopkhozy, was equivalent to 8.7 million hectares. With a yield of 9.9 quintals per hectare, the indicated sovkhoz grain crop was 8.6 million tons.

The rest of the grain production—that of individual peasants, kolkhozniki, and workers—probably did not exceed 2.2 to 2.5 million tons, their grain acreage having been 2,175,000 hectares.[13]

Thus the indicated total barn crop of the Union in 1937 was 96 million tons, which is 20 percent below the official estimate of 120.3 million.

Incidentally, Shimichev's and Kantyshev's figure on the average quantity of grain threshed per hectare by the sovkhozy in 1937 removes any doubt that, as early as that year, the grain crops of the state farms were officially reported in terms of biological rather than barn yields.[14] Of the total grain crop of 1937, officially estimated at 120.3 million tons from 104.5 million hectares, the share of the kolkhozy was 107.2 million tons from 93.6 million hectares.[15] This leaves 13.1 million tons from 10.9 million hectares for the sovkhozy and other producers. If the actual crop of the sovkhozy (8.6 million tons) were entered in the statistics, the individual peasants, kolkhoz members, and similar producers would have had an output of about 4.5 million tons from 2.2 million hectares in 1937. A yield of fully 2 tons per hectare from so large an area is impossibly high for Russian conditions. The crop of those producers was estimated above at 2.2 to 2.5 million tons and may have been entered in the official total at say 2.6 to 3.0 million tons. Hence the figure used for the sovkhoz crop must have been between 10.1 million and 10.5 million tons. Thus a discount of 15 to 18 percent would be needed to reduce the official sovkhoz crop estimate to the barn-crop level of 8.6 million tons.

Crop of 1938.—While the regulation concerning obligatory deliveries remained unchanged and the government had the first claim on the crop, it seems unlikely that, with the harvest as poor as it was in some areas in 1938, the government could have collected its dues in full. It is assumed, therefore, that obligatory deliveries declined about 5 percent in 1938, or to 10 million tons. Accepting this figure as constituting 15 percent of all kolkhoz distributions (Arina's percentage), the indicated total is 66.7 million tons (Table 60, p. 738). From this total a seed use of 12.4 million tons is obtained. This is .9 million tons less than the quantity indicated by Arina's data for 1937—a reduction explained partly by the decline in the kolkhoz grain acreage and partly by the saving made necessary by the poor crop.

The poor 1938 crop necessitated a great increase in seed and other

[12] I. Kantyshev, "Sovkhozy in the Conditions of War and in the 4th Five-Year Period," *Socialist Agriculture*, July-August 1946, pp. 43–44.

[13] The probable range is represented by 2.4 million tons in the tabulation.

[14] The writer himself had such doubt. One hesitates to believe that the government would publish exaggerated figures of even the crops obtained on its own farms.

[15] *Kolkhozy in the 2d Stalin Five-Year Period*, pp. 82 and 89.

grain loans from the government. These are estimated at 2.7 million tons. (In 1939 the repayments of loans amounted to around 3 million tons.) Thefts and other unaccounted disappearance may have been about as large as in 1937–38. Hence, the analysis leads to 67.0 million tons as the probable grain crop of the collective farms.

The sovkhozy had a grain acreage of 8.5 million hectares in 1938. While Shimichev gave the yield of the sovkhozy at 8.6 quintals, 8.4 quintals were implied in Kantyshev's data. The higher figure is used here as a partial insurance that the figures pertain to the sovkhozy of the Commissariat of Sovkhozy only. The sovkhoz grain crop thus computed is equivalent to 7.3 million tons. The grain acreage other than that of the kolkhozy and sovkhozy amounted to 2 million hectares in that year, and the crop from this area is unlikely to have been larger than 1.6 million tons. Thus the indicated total grain crop of the USSR in 1938 was 75.9 million tons. Since the official estimate was 94.9 million tons, the necessary discount was again 20 percent.

Crop of 1939.—If the obligatory deliveries were assumed to have been the same in 1939–40 as in 1937–38 (10.5 million tons), and this figure were used as the basis for reconstructing the total distributions of the kolkhoz grain supplies, the figure obtained for seed use would be 13.2 million tons, practically the same as that computed for 1937–38, although the grain acreage of the kolkhozy in the meantime declined by about 4 million hectares. With an inadequate provision for this discrepancy, the estimate for seed use is reduced to 13.0 million tons, and the total grain distributions by the kolkhozy in 1939–40 are computed from this figure by use of Arina's percentages. The resulting total distribution is 71.4 million tons. With loans estimated at 1 million tons, and thefts and other unaccounted disappearance at 3 million, the barn crop of the kolkhozy in that year totals 73.4 million tons.

According to Kantyshev,[16] the yield of the sovkhozy in 1939 was 77 percent of that in 1937, making it 7.6 quintals per hectare. If the acreage did not change, the indicated harvest was 6.5 million tons. To be on the conservative side, it is here assumed to have equaled the 1938 harvest of 7.3 million tons. The residual grain crop probably shrank to 1.5 million tons or less. Thus the Soviet barn crop of 1939 totaled 82.2 million tons.

Crop statistics of 1939 and succeeding years were never published, but Molotov mentioned in a speech that the 1939 crop amounted to 106.5 million tons.[17] Hence the indicated barn crop was 23 percent short of the official figure.

Crop of 1936.—One writer stated: "The average yield of grain and dry legumes per hectare on 157,423 collective farms in 1937 was equivalent to 169.8 percent of the yield of the same crops in 1936."[18] Another said that the grain crop of 90.8 percent of all kolkhozy in 1937 was 79.3 percent higher than that of 1936.[19] Since one author spoke of yields and the other of crops, and furthermore since the grain acreage of the kolkhozy in-

[16] *Loc. cit.*

[17] *Pravda*, Nov. 7, 1939.

[18] D. Rud, "157,423 Collective Farms," *Izvestiya*, May 22, 1938.

[19] M. Nesmii, "Incomes of Kolkhozy and Kolkhoz Peasants," *Planned Economy*, September 1938, p. 76.

creased by 5.7 percent in 1937, the two statements are mutually corroborative.

If the estimate of 82 million tons as the 1937 kolkhoz grain crop accounted for (Table 60, p. 738) is correct, Nesmii's statement indicates a 1936 output of 45.7 million tons, excluding theft and other uncontrolled uses, and of about 48.7 million tons including these items. The grain acreage other than that of the kolkhozy was probably equal to 15 percent of the total, and the corresponding grain crop may be assumed to have been about 18 percent of the total. On these assumptions, the indicated total barn crop of the USSR in 1936 was 59.8 million tons—28.0 percent below the official figure of 83 million tons for that year.

Crop of 1935.—According to Rud, the average yield of the collective farms investigated by him was 26.4 percent higher in 1937 than in 1935.[20] Nesmii's data indicate an increase of 43.6 percent in the kolkhoz crop from 1935 to 1937.[21] As was the case with the 1936 figures, the data of both authors roughly coincide, because the kolkhoz grain acreage increased 10.8 percent between 1935 and 1937.

Nesmii's statement implies a total kolkhoz grain crop in 1935 of 57.1 million tons without theft and other unrecorded disappearance, or 60.1 million tons including these items. The grain acreage other than that of the kolkhozy was equivalent to 18.4 percent of the total in 1935. The respective crop may be assumed to have been about 20 percent of the total. The indicated total barn crop in 1935 was thus 75.2 million tons, as against the official figure of 90 million.

Summary of the findings.—The following tabulation summarizes the findings (in million tons):

Year	Official estimates	Reconstructed barn crops	Indicated percentage discount
1935	90.1	75.2	16.5
1936	83.0	59.8	28.0
1937	120.3	96.0	20.2
1938	94.9	75.9	20.0
1939	106.5	82.2	22.8

MIXED APPROACH

The mixed approach consists in (1) using the official data on all deliveries of the kolkhozy to the government and on the distributions of the kolkhoz grain to members, (2) estimating the utilization of the kolkhoz grain for the other needs, and, finally, (3) estimating the total grain crop by making allowances for the non-kolkhoz crop. This approach is closely related to that of reconstructing the total grain crop from Arina's data, especially since the estimates of the utilization of items for which official figures are not available, mainly seed and feed, are made to agree with the figures computed from Arina's data.

The mixed approach is used only for the period 1933 through 1936 (Table 61), because its application to the crops of 1937 through 1939 would produce the results already arrived at.

For 1935 and 1936, estimates of the crops have been obtained by both

[20] Rud, *loc. cit.* [21] Nesmii, *loc. cit.*

reconstruction and the mixed approach. They are close for 1935 (75.2 million tons by reconstruction, and 77.1 million by the mixed approach). The figures obtained for the 1936 crop (59.8 million and 65.5 million tons), while differing more substantially, are satisfactory for the type of analysis involved. The writer did not feel it desirable to force the figures to obtain an even closer relation. It is noteworthy that the figure computed for 1936 by the mixed approach, which involves estimating part of the utilization by the writer, is the higher. One always tends to overestimate the "min-

TABLE 61.—DISTRIBUTION OF THE KOLKHOZ GRAIN AND THE TOTAL GRAIN CROPS, 1933–36

(Million tons)

Item	1933	1934	1935	1936
Kolkhoz distribution				
All deliveries to the government[a]	17.8	21.1	23.9	21.2
Distributions to members[b]	14.2	16.3	16.5	12.4
Seed[c]	10.1	11.1	11.8	12.1
Feed[d]	5.0	6.0	7.0	6.0
Miscellaneous	1.0	1.0	1.0	1.0
Total	48.1	55.5	60.2	52.7
Theft and other uncontrolled use[e]	3.0	3.0	3.0	3.0
Seed loans obtained	1.0	1.2	1.5	2.0
Probable kolkhoz crop	50.1	57.3	61.7	53.7
Indicated crop of USSR[f]	68.2	74.4	77.1	65.5
Indicated average crop of USSR, 1933–36		71.3		

[a] As given in *Kolkhozy in the 2d Stalin Five-Year Period*, p. 95, plus 1.5 percent for 1933 to 1935 and 3 percent for 1936—for discounts in kind on grain below minimum requirements. Voluntary sales by the kolkhozy to the government were stated in the above source only for 1935 and 1936. Similar purchases from kolkhozy and other sources in 1933 and 1934 were given as 414,000 and 3,585,000 tons respectively in *Agriculture USSR, 1935*, pp. 266–67, and at 400,000 and 3,800,000 tons respectively by G. Y. Neiman, *Internal Trade of USSR* (Moscow, 1935), p. 249. According to the latter source, the share of the kolkhozy in those sales was about 70 and 80 percent respectively.

[b] According to various official sources, the average distribution per trudoden was 2.9, 2.8, 2.4, and 1.6 kilograms respectively in 1933 through 1936. These figures were multiplied by the total number of trudodni performed in all kolkhozy as stated in *Kolkhozy in the 2d Stalin Five-Year Period*, p. 40.

[c] At 1.45 quintals per hectare, indicated by the data implied in the statements of Soviet writers, analyzed in the preceding section.

[d] Feeding estimated on the basis of available data on the numbers of livestock owned by the kolkhozy and feeding rates, as well as on the probable size of the harvest.

[e] Theft and other uncontrolled use, except theft of seed, is uniformly estimated at 3 million tons per year.

[f] Total USSR crops for 1933 and 1934 calculated on the assumption that the kolkhoz barn crops of those years amounted to 73.3 and 77.0 percent respectively of the total barn crops; that is, that the relation between the kolkhoz and non-kolkhoz barn crops was the same as between the officially reported crops (see *Agriculture USSR, 1935*, p. 267). The present writer doubts this relationship but hesitates to replace it by another. USSR crops for 1935 and 1936 are based on the assumption that the kolkhoz crops were 80 and 82 percent respectively of the total barn crops.

imum" needs under such precarious conditions as those in the Soviet Union in 1936. The distributions to the kolkhoz members, small as they were according to official data, may nevertheless have also been overestimated. Less seed than the normal amount may have been used, and the feed use may also have been less than is here assumed.

The figures arrived at by the mixed approach for both 1935 and 1936 combined are only 5.6 percent above those obtained by reconstruction—a satisfactory result if the many uncertainties in the computations are considered. The average crop of 1935 and 1936, as computed by the mixed approach, was 18 percent below the official figures.

Since the figures for 1935 and 1936 obtained by the mixed approach are in reasonable agreement with those obtained by reconstruction, the figures for 1933 and 1934 of the mixed approach must also be accepted as reasonably reliable. These figures, 68.2 million and 74.4 million tons respectively, are below the official figures by 24 and 17 percent respectively.

The average crop of 1933 through 1936 emerges from the analysis by the mixed approach as 71.3 million tons as against an average of 88.1 million tons according to official estimates for the same years, implying a needed discount of 19 percent. If the 71.3 million tons is wrong, it is too high for the average barn crops of those years.

The writer is certainly not happy to indulge in all this estimating, assessing, and reconstructing, but he has no other choice except to reconcile himself to not knowing what the Soviet experimenters do not wish others to know.

NOTE I

GRAIN YIELDS COMPARED WITH YIELDS OF OTHER MAJOR CROPS

A comparison of grain yields with yields of other crops in 1933–38, when only grain output was determined on the root, throws added light on the difference between on-the-root and barn yields. The comparison must be limited to those other crops for which sufficient information is available, and presupposes, of course, that estimates of their yields are correct. Owing to the predominant role of grain in Russian agricultural production, diet, and the whole economy, and the general attention it therefore attracts, it is reasonable to assume that the statistics of most other crops were much less tampered with than grain—for a time.

Since the elimination of the permitted discount for loss in the on-the-root system of estimating grain yields (see pp. 730–31) probably occurred in 1937, the periods 1933–36 and 1937–38 are treated separately here.

FOR 1933–36

Below are shown the percentage increases or declines in yields of grain and other major crops from the average of 1925–28 to the average of 1933–36:

Grain, official	+ 6.3
Grain, computed	−12.0
Sunflower seed	−17.5[a]
Potatoes	+ 5.5
Flax	0
Cotton	+11.1
Sugar beets	−23.0

[a] No official estimate for the yield of sunflower seed in 1936 was released, obviously because the crop was very poor. The figure used here—4.7 quintals per hectare—is a rough approximation based on Stalin's statement of the total amount of oilseeds produced in the USSR in that year.

The computed grain yield corresponds well with the yields of the other crops if the specific condition of each of the crops is considered. That cotton made a much better showing than grain was partly the result of relatively large applications of commercial fertilizer in 1935 and 1936 and other special measures taken to improve the yields of this crop. The cotton yield was also low in 1925–28 relative to the level attained before World War I. The yield of sugar beets was far below the pre-collectivization level even in 1935 and 1936, in spite of similar though somewhat less intensive efforts to effect its increase. Flax also received special attention, but less than cotton and sugar beets. The average yield in 1933–36, while the same as in 1925–28, was about 30 percent below the pre-Revolutionary level. The computed grain yields of 1933–36, however, were below that level by only about 12 percent. There were specific reasons why the yields of sunflower seed declined more than those of grain (see pp. 577–78), but they may be sufficiently reflected in the fact that the 1933–36 yields of sunflower seed were below the pre-collectivization level by 18 percent, as against the computed decline of the grain yield by about 12 percent.

Important factors operated toward relatively good potato yields in the 'thirties, especially in the early part of the decade. The individual peasants and kolkhozniki had a large share in this crop (43.4 percent in 1935). While the socialized sector was disorganized and the worst effects of this condition on the yields were only slowly overcome, the inadequate distributions of food by the kolkhozy to their members gave a strong stimulus for the latter to get everything possible out of their own small plots. The practice of buying manure for the kolkhozy from their members, which later became rather widespread, had not yet developed. Although the total supplies of manure declined greatly, the kolkhozniki may have had more manure for their potato plots than had been used formerly.[1] There was also a certain shift in the total potato acreage to northern and central Russia, where the highest potato yields are normally obtained. Still, unless weather conditions were particularly favorable for potatoes, the officially reported yields of that period were probably moderate overestimates. It is indeed possible that weather conditions were particularly favorable and that potato yields were overestimated as well. The yield of 8.32 tons per hectare in

[1] Unfortunately, the voluminous *Agriculture USSR, 1935* does not give the potato yields separately for the socialized and private sectors.

1934—moderately above the 1925–28 average—does not fit well in the general picture of Soviet agriculture of that year.

1937 AND 1938

The average yields of 1937 and 1938 differed from those of 1925–28 by the following percentages:

Grain, official	+30
Grain, computed	+ 6
Potatoes	− 4
Sunflower seed	−11[a]
Flax	+12
Cotton, irrigated	+50
Sugar beets	+14

[a] No official estimate of the 1938 yield of sunflower seed has come to the attention of the writer. It was roughly calculated at 5.3 quintals (see general note to Chart-Table 27, p. 791). The estimate is much more likely to be too high than too low.

The officially reported increase in the yield of sugar beets and even the remarkable gain in cotton are credible in view of the special inducements offered to producers of these crops, and the sizable allotments of commercial fertilizers to them. But the official figure of a 30 percent rise in grain yield appears fantastic when one considers that sugar beets, though enjoying the special advantages, boasted an increase of only 14 percent.

The yield of flax shows a measurable increase simply because the level in 1925–28 was so low. As for potatoes, adverse weather conditions reduced the 1938 yield to such an extent that the average for 1937 and 1938 shows a decline from the 1925–28 average. Had the weather in 1938 been no more unfavorable for potatoes than it was for grain, the 1937–38 average potato yield might have matched the percentage increase computed for grain.

The specific conditions that kept sunflower-seed yields relatively below those of grain in the preceding period were even more influential in 1937 and 1938. However, the sunflower-seed yield could not have declined 11 percent under conditions that would permit grain yields to climb more than a few percent.

NOTE J

UTILIZATION OF GRAIN IN SPECIFIED PERIODS AND YEARS

A good idea of the amount of grain used for all important purposes can be formed for most of the years before the Union's entrance into World War II. Some items are known exactly; most others can be estimated with sufficient accuracy. For the war and postwar years, however, the student would have to resort to sweeping over-all computations, or simply to guesses. Consequently, only the prewar years are considered here.

THE DATA

The best data on utilization are available for the period 1925–26 to 1927–28. All estimates for that time are substantiated by a great deal of

evidence and are in practically full agreement with the crop estimates. The evidence on utilization in pre-Revolutionary years is less complete; the estimates of feed use have to be based on analogy with post-Revolutionary years, but any error in this category could affect the total utilization to only a minor extent. The published material on the utilization of grain began to be scarce in 1928 but, equipped with the knowledge on the pre-collectivization situation, one can arrive at fairly reliable conclusions for later years.

Human consumption is the outstanding item in the utilization of grain in Russia. The Russian zemstvo statisticians were already gathering statistics on the per capita consumption of the rural population in the last decades of the nineteenth century. Extensive data are available on this score for the period 1900 to 1913, and also for later years up to 1928. Collection of data did not stop even during the Civil War and the disastrous famine of the early 'twenties. Only scattered material has been published since 1928, however. Even if such material as is available is correct, most of it is selected data. The reader is supposed to know only what is at least moderately favorable.

Russian statisticians gave considerable attention to seed requirements during the earliest stages of crop estimating, before other forms of utilization had begun to command their interest. The first Russian statistics of grain yields were still in terms of the return on a given volume of grain sown—the system adhered to in the world for thousands of years. Moreover, in some areas the peasants habitually determined not only their crop production but even their land possessions from the amount of seed they used. They would say: "I have two chetverti rye and one and one-half chetverti oats."[1] In order to determine the production in the first instance, the acreage and the production in the second, the statisticians had to know the amounts of seed used per unit of area. The statistical determination of grain yields continued in this manner until the Revolution. In recent years the seeding rates have been more or less imposed on the producers by the government, and are therefore well known.

Feed use is the second largest item of direct utilization[2] of grain in Russia. While data on the use for feed before the Revolution were collected by the zemstvo statisticians, they were not systematized, and the lack of systematized data led to significant errors. Because of the very large regional variations, they provided an unsatisfactory basis for conclusions for the country as a whole.

In 1932 the Central Office of Economic Accounting published a comprehensive study of the animal industry, which included data on feeding rates by type of livestock in areas as small as oblasti.[3] For the more important types of livestock, annual figures for 1925–26 through 1928–29 were given; for others the average of 1925–26 to 1927–28. These data, supplemented by information on the size of the crops that have always noticeably affected livestock feeding in Russia, as well as by other evidence, permit one to draw

[1] A chetvert was roughly equivalent to six Winchester bushels.

[2] The expression "direct utilization" is used to mean all uses other than addition to, or withdrawals from, the carryover.

[3] V. P. Nifontov, *Animal Husbandry of USSR in Figures* (Moscow, 1932), pp. 127–49.

fairly reliable conclusions, not only for the time to which the data pertain, but also for earlier and later years.

Exports or imports are known exactly, and industrial uses can be estimated with certainty.

Loss, the only other item of direct utilization, was normally disregarded in Russian analyses, for reasons not clear to the writer. Since it seems improbable that the analysts did not realize the existence of certain losses, their provisions for the several needs possibly included a provision for loss. Owing to this, a duplication may be involved in the writer's computations. While the data of those analysts for individual items are used, a separate provision for loss is made. But this provision is small; hence the possible error is almost negligible.

When the disposition of the entire crop is to be determined instead of the direct utilization, the change in carryover stocks must be known. If reliable data on this score are lacking, the results of the whole computation become uncertain. Only in exceptional cases are the estimates of production and utilization so nearly accurate that simple subtraction of the latter from the former will yield a reliable figure for the change in carryover. The writer is by no means certain that his own computations are correct even within one or two million tons. Yet an annual overestimate of the crop and an underestimate of utilization of a million tons each year would, over a period of five years, exaggerate the carryover by 10 million tons.

In general, only the computations for individual years are considerably affected by lack of direct information on carryover. The danger of a serious error is much smaller when several years are considered together. An increase in carryover in one year may be offset by its reduction in the next year, and vice versa. For example, the crops of both 1932 and 1936 were poor. The producers' granaries were probably as bare of stocks at the end of 1936–37 as they had been at the beginning of the 1933–34 season. Some increase occurred in non-producers' carryover during the period, but the average yearly increment was so small that the average total direct utilization in 1933–34 to 1936–37 probably almost coincided with the average crop of 1933–36. From 1937 on, the situation as to the changes in carryover was unfortunately more complicated (see pp. 757–59).

FOOD

1909–10 to 1913–14.—The population of the territory later included in the USSR was about 133 million in January 1912, the mid-point of the five crop years 1909–10 through 1913–14.[4] The numerous surveys of grain consumption by the rural population before World War I were summarized in these annual per capita figures: grain-surplus areas, 278 kilograms; grain-deficit areas, 241 kilograms.[5] The per capita consumption of the urban population can be estimated at 230 kilograms. The average for the whole population works out almost exactly to 260 kilograms. Hence the total requirement of grain for food was 34.6 million tons (Table 62).

[4] The official estimate for January 1, 1914 was 138,200,000. The yearly population growth amounted to about 1.8 percent in those years.

[5] *Statistical Handbook USSR, 1928*, Central Statistical Board (Moscow, 1929), p. 853.

TABLE 62.—GRAIN UTILIZATION BY ITEMS, IN SPECIFIED PERIODS AND YEARS*
(*Million tons*)

Item	Average 1909–10 to 1913–14	1927–28	1932	Average 1933–34 to 1936–37	1938
Direct utilization					
Food	34.6	38.0	33.6	37.0	41.4
Seed	14.0	13.0	14.0	14.0	14.0
Feed	19.0	19.5	12.0	13.0	18.0
Technical uses	0.5	1.0	1.5	1.7	2.5
Exports	10.5	0.4	1.4	1.3	1.0
Loss	2.0	2.0	2.0	2.5	3.0
Total	80.6	73.9	64.5	69.5	79.9
Change in carryover	+1.0	—0.8	probably decline	+1.0	+3.0
Grand total	81.6	73.1	?	70.5	83.0

* See comments in the text.

1927–28.—All data for 1927–28 in Table 62 are almost exact reproductions of the Gosplan computations.[6] The figure for food use—38.0 million tons—is based on the assumption that the rural population consumed 221 kilograms of flour and groats (as usual including dry legumes) and the city population 179 kilograms. These per capita figures, applied to the respective population numbers, yield a final sum of 32.5 million tons of flour and groats. To put this in terms of the quantity of grain it represented, 5.5 million tons are added—5.0 million for the millfeed assumed to have been extracted in milling the grain, and .5 million for estimated milling loss. The average per capita consumption of grain for the whole population is indicated as 251 kilograms, 255 kilograms having been allowed for the rural population and 225 kilograms for the urban.

1932.—The utilization of grain for food in 1932 is here estimated at 33.6 million tons, or 209 kilograms per capita—a level probably too high. The subject is discussed in some detail in chapter xxii, pp. 551 ff.

In the first half of 1933, food use of grain was at an even lower level than in 1932. But this disastrous period is disregarded here.

1933–34 to 1936–37.—The population averaged about 162 million in 1933–34 through 1936–37. The yearly per capita consumption in this period may be estimated at possibly 230 kilograms. With the prevailing high extraction rates, that quantity provided for almost the same per capita consumption of grain products as in 1927–28. The need for bread, of course, continued to be much greater throughout this period than in 1927–28, owing to scarcity of other food, but this need remained unsatisfied.

1938.—Because bread and other grain products were relatively abundant while supplies of all other foodstuffs (except potatoes, vegetables, fruits, and sugar) were below pre-collectivization levels, and because the

[6] *1st Plan*, II, Part 1, pp. 333, and other publications.

proportion of children in the total population was smaller, the per capita consumption of *grain products* in 1938 may well have exceeded that of 1927–28. But since extraction rates were much higher, it is doubtful if the grain products consumed represented as much *grain* as the 1927–28 consumption. The slightly lower figure of 245 kilograms is therefore accepted for 1938. At this rate, some 41.4 million tons of grain were needed to feed the population of about 169 million.

Bread became scarcer in the second half of 1938 because of that year's poor crop harvest. After mid-1939, the government's accelerated stockpiling campaign resulted in a further contraction of consumption, but probably only on a moderate scale.

FEED

Tables 63 and 64 give a good picture of pre-collectivization practices of grain feeding in Russia. Grain was used sparingly for feed. Poultry, for example, were fed only about a quarter as much per head as in the United States, and grain feeding of other animals was similarly limited.

From the data in Table 63 and the tabulation below, it is obvious that draft animals absorbed most of the grain fed. Quantities used for productive livestock were small, hogs being the largest consumers of grain in this group.

A large part of the rye and wheat shown as fed in Table 64 consisted of millfeed. Indeed, practically no wheat grain was fed in Russia. Some rye was used, however, preferably in the form of meal strewn on straw. In tight years, such as 1929–30, this practice was largely discontinued, and practically no rye fit for human consumption was fed.

1909–10 to 1913–14.—The average yearly use of grain for feed in 1909–10 to 1913–14 is assumed to have been 19 million tons. If the average feeding rates of grain, including flour, based on the data in Table 63,[7] are applied to the livestock reported on farms in the summer of 1916,[8] the results are as follows (in million tons):

Horses[a]	13.3
Hogs	2.7
Cattle	2.1
Sheep and goats	0.3
Poultry	1.3
Total	19.7

[a] Three horses younger than of working age were assumed to be equivalent to one of working age in consumption of feed grain.

[7] The Gosplan (*Control Figures . . . . for 1928–29*, p. 226) took the view that in 1926–27 and 1927–28 the feeding rates had increased considerably as compared with the preceding years, and were at least 20 percent above the prewar level. So far as 1927 is concerned, that assumption, which obviously pertained only to the productive livestock, is not supported by the detailed analysis of the Central Office of Economic Accounting, presented in Nifontov's book (see Table 64). The increase in the utilization of grain (including millfeed) for feed by 3 million tons from 1925–26 to 1927–28, shown in the table, was indeed slightly less than proportional to the increase in the herds in those years.

[8] See page 230 on the appropriateness of applying these data to the years preceding World War I. Horses were almost certainly more numerous in 1913 than in 1916. Otherwise the 1916 data may be fully applicable to the average of 1909–13.

The utilization of grain for feeding city and army livestock may be estimated at 2 million tons, making a total of 21.7 million tons. The fact that the 1916 census was taken in the early summer could probably be disregarded, because the number of adult horses in 1909–13 almost certainly was larger than in 1916. But to keep the feed figure for 1909–10 to 1913–14 in

TABLE 63.—ANNUAL FEEDING RATES OF CONCENTRATES, 1925–26 to 1928–29*

(Kilograms per head)

Type of animal and feed	1925–26	1926–27	1927–28	1928–29
Adult horses				
Grain and flour	430	544	417	408
Millfeed	32	46	38	
Oilcake	2	3	3	
Cows				
Grain and flour	54	59	53	76
Millfeed	27	44	35	
Oilcake	10	15	16	
	Average 1925–26 to 1927–28			
Young cattle over 1 year				
Grain, flour, millfeed		31		25
Oilcake		3		
Calves				
Grain, flour, millfeed		28		32
Oilcake		3		
Hogs and shoats				
Grain, flour, millfeed		237		264[a]
Oilcake		10		
Piglets				
Grain, flour		50[c]		...
Millfeed		22		
Sheep and goats[b]				
Flour, millfeed		3		3[d]
Poultry				
Grain, flour		7.8		...
Millfeed		0.7		

* Nifontov, *op. cit.*, pp. 128–48.

[a] While the data for 1925–26 to 1927–28 were given under the heading "hogs and shoats," this figure is found under the heading "hogs."

[b] Oilcake for piglets and for sheep and goats was included in the source with the residuals of other processing industries (other than those of flour mills).

[c] In addition, 6 kilos of residuals from processing of technical crops.

[d] All concentrates.

line with that for 1927–28 it seemed proper to cut it enough to keep the total utilization of grain from exceeding at least the trend value of the 1913 grain crop as estimated by the Gosplan—i.e., to 19 million tons. This estimate must be considered conservative, at least in relation to the estimates of feed utili-

zation in 1938. As the reader will see, the feeding of grain in 1938 is estimated at 18 million tons, or only 1 million tons less than the estimate for 1909–10 to 1913–14, although in 1938 rural horses, the principal animals consuming grain, numbered less than half of those needed and therefore certainly available in 1909–10 to 1913–14, while horses had almost disappeared from the cities.

TABLE 64.—FEED USE OF GRAIN (INCLUDING MILLFEED), 1925–26 to 1929–30*

(Million tons, except as noted)

Year	All grain	Rye and wheat	Barley	Oats	Corn	Percent of total crop fed
1925–26	20.9	6.2	2.6	8.4	2.2	28.0
1926–27	21.3	8.3	2.8	10.5	1.5	31.1
1927–28	23.8	8.7	2.6	9.6	1.7	32.9
1928–29	22.6	6.7	2.5	6.9	1.5	31.0
1929–30	21.6	5.6	2.2	10.8	1.3	30.1

* Nifontov, *op. cit.*, p. 127.

1927–28.—If Nifontov's rations, generally for 1927–28 though in some cases averages for 1925–28 to 1927–28 (see Table 63), are applied to the average of the numbers of livestock on farms in the summers of 1927 and 1928, the indicated utilization for feed in that year was equivalent to 22.4 million tons including millfeed, or 17.4 million without. These figures include a provision of 2 million tons for the urban and army livestock. A discount would be appropriate, since Nifontov's rations were computed on a yearly basis while the livestock numbers are taken at the seasonal high, but this was not done. Perhaps the reason is insufficient; but the fact is that, according to official computations (see Table 64 taken from Nifontov's study), total feed use of grain and millfeed amounted to 23.8 million tons in 1927–28. Since the output of millfeed was estimated at 5 million tons, the quantity of grain proper was 18.8 million tons or 1.4 million above that computed above. The official figure on total feed use possibly was computed as a balance, and included the loss which commonly was not considered separately in the computations of consumption and utilization at that time.

1932.—If the average feeding rates of grain (excluding millfeed) in 1925–26 to 1928–29 are applied to the livestock numbers on farms in the summer of 1932, a figure of about 11.5 million tons is obtained. With 2 million tons for non-farm livestock, this would give a total of 13.5 million tons. Only 12 million tons, however, are taken into account, in spite of the decline in the supply of millfeed by more than 3 million tons.[9] The least important consideration for this cut is that the average yearly number of livestock in 1932 may have been below that counted in the summer of the same year. Owing to the shortage of all supplies, the feeding rations of all kinds of productive livestock were reduced considerably below the pre-collectivization

[9] Grain and millfeed under Soviet conditions are not fully substitutable one for the other. There is hardly any doubt that, for example, most millfeed formerly fed to cows was not replaced by grain in 1932.

level. An official publication gave the average utilization of concentrates per cow in livestock kolkhoz fermy in 1932–33 at only 24 kilograms, and per sheep at only 2 kilograms.[10] The reduction in poultry may have cut this practically to the number that can be maintained almost entirely on otherwise useless poultry feed not included in the rations. Even workstock may have been fed worse than before collectivization, although the great shortage of all kinds of draft power would have necessitated more work and more concentrated feed per work animal. The estimate of 12 million tons of grain fed in 1932 may indeed be too high.

1933–34 to 1936–37.—The number of work horses, the big grain consumers, averaged even lower in this period than in 1932. But there were almost 10 million more hogs on feed (on the basis of summer counts), and also more poultry. The sovkhoz practice of feeding concentrates more heavily (see below) was only beginning; it may have resulted in a moderate increase in the amount of grain fed in 1936–37, but it is not likely to have had a measurable effect on the average consumption in all four years. The average utilization of concentrates per animal on livestock kolkhoz fermy was increasing rapidly in 1933–34 and 1934–35,[11] but the total amounted to only 600,000 to 700,000 tons in 1933–34 and 1,100,000 tons in 1934–35.[12] A further increase certainly occurred in 1935–36, but 1936–37 was a very poor crop year. The average use of grain for feed in 1933–34 to 1936–37 is accepted here as 13 million tons. This seems to agree well with the approximate official estimate of 11.2 million tons for 1934–35. The utilization of grain (including millfeed) in 1934–35 was officially estimated at 14 percent of the crop, or 12.7 million tons.[13] Since millfeed probably amounted to about 1.5 million, the quantity of grain proper was 11.2 million tons.

1938 and later prewar years.—With the same feeding rations, only about 2.5 million tons more grain would have been needed in 1938 than in 1933–34 through 1936–37. This would have been distributed among the additions to the various herds as follows: horses, about 0.5 million; hogs, about 1.25 million; poultry, 0.6 million. However, an increase of 5 million tons is assumed here, in view of the general tendency to feed more liberally when supplies are more plentiful, and the specific tendency of the sovkhozy (which the kolkhozy to some extent followed) to feed concentrates more heavily than

[10] *Livestock Kolkhoz Fermy of the USSR*, Gosplan, Central Office of National-Economic Accounting (Moscow, 1936), pp. 19 and 21.

[11] *Ibid.* For cows and sheep the data were as follows (kilograms per head):

Year	Cows	Sheep
1932–33	24	2
1933–34	37	4
1934–35	44	5

The difference in the calendar-year figures for cows is noteworthy: 1932, 39 kilograms; 1933, 33 kilograms; 1934, 35 kilograms.

[12] I. A. Kraval, "Upswing in Animal Husbandry," *Socialist Reconstruction of Agriculture*, December 1935, p. 58. On feeding in livestock kolkhoz fermy in those years, see also V. P. Nifontov, *Production of Animal Products in the USSR* (Moscow, 1937), p. 24, and Kraval, *Animal Husbandry of the USSR on the Upswing* (Moscow, 1936), p. 7. For various reasons, the rates of feeding given by Kraval in this study are not comparable with those of 1925–26 to 1928–29 by Nifontov.

[13] Kraval, *Animal Husbandry . . . . on the Upswing*, p. 7. Kraval at the time was chief of the Central Office of Economic Accounting.

was the practice before collectivization. There was also slightly more millfeed available than in preceding years.

The desire of the government to increase stockpiles after the outbreak of war in 1939 may have had less effect on feed use than on food use of grain. The sovkhozy seem not to have been compelled to economize on concentrated feed. The curtailment of grain distributions to the kolkhoz members may have affected feed use. However, since only a small part of these distributions was ever used for feed, further curtailment of this use could not have considerably affected the total utilization for feed.

OTHER ITEMS

Seed.—The harvested grain acreage in 1913 was 94.4 million hectares according to the Central Statistical Committee, and 102.7 million hectares according to revisions suggested by Ivantsov and accepted by the Gosplan. The average acreage in 1909–13 was little less than that. Since most of the grain was sown by hand, 14 million tons for seed seems a conservative estimate.

The seed requirements for later years were also computed at approximately the rate of 1.4 quintals per harvested hectare. As for 1909–13, it is assumed that this amount took care of the resowings, which are rarely large in Russia. Variations in the composition of the grain crops (millet and corn require little seed) were neglected, as was the fact that the shift to seeding by machine must have reduced the seed requirements. The latter factor may have been offset by the wastefulness associated with the new form of economy.

Exports.—Russian grain exports averaged about 10 million tons in 1909–13, but an allowance was made for the fact that the territory later to be comprised in the USSR had a surplus in its trade with the portions subsequently separated, taken as a whole. Otherwise the official figures on net exports are used.

Industrial uses.—The grain used for industrial purposes was estimated on the basis of evidence on alcohol produced from grain, and on the output of breweries. Grain used for homemade liquor and beer came out of the amounts provided for human consumption.

Loss.—A uniform assessment of 2 million tons was made for loss, including unusable screenings, waste other than in the mill, spoilage, and so forth, for the average of 1909–10 to 1913–14, 1927–28, and 1932. Government procurements were more than trebled during the 'thirties and there was much inexpert handling of the state-owned grain. Moreover, storage space at the disposal of the government was increasing slowly, and much state-owned grain was stored poorly. The 3d Plan prescribed that the storing of grain in the open be discontinued in the first half of the 3d Plan Period. Furthermore, an increasing quantity of grain was harvested by combine; of this the proportion that was not dry enough for the operation increased even more rapidly than the proportion so harvested. Loss, which includes spoilage, was probably substantially heavier in 1932–33 to 1936–37 than in 1927–28. It is questionable whether the 500,000 tons added to the "loss" figure for that period (Table 62, p. 751) covers this increase.

The spoilage of government grain probably was particularly heavy after 1937 when the government stocks reached a substantial size. The construc-

tion of new storage space probably lagged behind the accumulation of stocks during the 3d Plan Period, even more than during the 2d Period, and stocks kept for a long time are much more subject to spoilage than those turned over quickly. Total loss in 1938 is estimated at 3 million tons, but this figure is possibly too low.

Changes in carryover.—The period 1909–13 was a very prosperous one for Russian agriculture. Four crops out of five were good to excellent. Moreover, the carryover into the 1909–10 season was very small, while the carryover at the end of the 1913–14 crop year was expanded because unsatisfactory prices in international markets in 1913–14 (just before the war began)[14] reduced exports considerably below the level justified by the excellent 1913 crop. The increase of carryover during the five-year period is here estimated at 5 million tons—probably a very large underestimate. The only reason for using such a small figure for the undoubtedly great carryover accumulation in those years is that the output data do not leave space for a higher estimate.

The reduction in the carryover in 1927–28, shown in Table 62 (p. 751), is an official estimate.

Stocks from former years probably declined during 1932, but no allowance for this decline is made here. If the reserves declined, this would mean that the crop was that much smaller, because the writer's provision for human consumption, feed, and seed is, if anything, too high.

The change in carryover in the period 1933–34 through 1936–37 has already been discussed (see p. 750). As stated above, no substantial increase in producers' reserves is likely to have occurred in that period. An increase in the government-owned carryover was made necessary by the greatly increased urban population. But it is not very likely that this carryover was increased by considerably more than was needed for that specific purpose. Even if, at that early stage, the government was anxious to lay in stocks for the eventuality of war, the production situation was such that only small quantities could have been spared for that purpose. In 1936–37, the last year of the period, government collections were adversely affected by the poor harvest (see Chart 33, p. 561), while the needs for seed loans and for coverage of the demand of the rural population for purchased bread simultaneously increased. The government also was particularly anxious to export as much grain as possible in all those years.

One million tons as the average yearly accumulation of stocks in such an unfavorable period as 1933–34 to 1936–37, accepted in Table 62, seems very large as compared with the same amount assumed for the favorable period 1909–10 to 1913–14. But the estimate for the earlier period may be too low. Furthermore, in the 'thirties the system of procurements insured to the government much larger deliveries than would have occurred under the economy of the Czarist times, and these large deliveries may have permitted an accumulation of stocks that would not have occurred otherwise.

The uncertainty as to the changes in carryover is particularly marked with reference to 1937 and subsequent years. The possession of a large stockpile of grain at the time of the German invasion is officially claimed.[15]

[14] How different was the situation at the beginning of World War II!

[15] Leader in *Socialist Agriculture*, January-February 1945, p. 4.

Analysis of available data leaves no doubt that the claim is justified, but it is impossible to estimate with a sufficient degree of exactness the amount stored.

It was mentioned that at the end of the 1936–37 crop year, there were no substantial stocks beyond those needed until the new crop was available. Both the peasants and the government were able to put aside quite substantial reserves out of the bountiful 1937 crop. Between them, they may have accumulated close to 15 million tons.

But the next year was quite different. Distributions of kolkhoz grain to the kolkhozniki out of the poor 1938 crop declined by more than 10 million tons (Table 60, p. 738), and the peasants were probably forced to use up a large part of their reserves from the preceding crop. The government, however, procured about as much grain in 1938 as in 1937.[16] While its grain distributions expanded considerably to meet the enlarged food demand of the rural population and the heavy increase in seed loans, its total outlay may not have exceeded the procurements. Thus its large carryover brought into the 1938–39 crop year may have been fully preserved and carried over into 1939–40.

The moderate 1939 crop scarcely exceeded current requirements. Distributions by the kolkhozy to their members declined further (Table 60, p. 738, and ever-growing numbers of kolkhozniki, after having exhausted the rest of their reserves, had to cover their deficit by purchases from the government. The state had procured from the 1939 crop more grain than from the bountiful 1937 crop, but distributions must have expanded greatly. The increase in government stockpiles in 1939–40 probably did not even approach the increase from the 1937 crop.

Scarcely a Soviet writer or speaker, discussing attainments of Soviet agriculture, fails to mention that government procurements reached 38.3 million tons in 1940.[17] This is an increase by 6.5 million over 1937.[18] Only a negligible portion of this increase came from the new territories. Producers probably parted with all additional output (as compared with 1939) and, for their own needs, may have continued drawing on their stocks, if they still had any. The government grain expenditure continued to rise, but its stocks could have nevertheless been piled up substantially during the crop year, at the end of which hostilities started.

Peasant stocks were probably approximately as low at the end of 1940–41 as they were at the beginning of 1937–38. Statistical analysis makes it very probable that government stockpiles increased by over 10 million tons over the period. But there are certain contradicting factors. No indication exists of construction of storage space on the scale that would have been needed to accommodate large additional stocks. Another important consideration is the fact that if huge stocks at the beginning of war had existed, at least a small part would have fallen in the hands of the Germans. Nazi

[16] The preliminary figure for all marketings in 1938–39 was 36.5 million tons as against 38.0 million tons in 1937–38. *Socialist Agriculture USSR, 1938*, p. 89.

[17] S. F. Demidov, *Development of Agriculture in the Post-War Five-Year Period* (Moscow, 1946), p. 7. See also A. A. Andreev, "On Measures to Raise Agriculture in the Postwar Period": Report to the Central Committee of the Party, February 1947 (in *Socialist Agriculture*, Mar. 7, 1947), the most important postwar report on agriculture.

[18] The figure for 1937 is from *3d Plan*, p. 232.

secret documents now available show only moderate takings; they prove that all the grain confiscated could well have originated from the 1941 and 1942 crops. Nor has the Soviet government ever complained of having lost really large quantities. The problem appears unsolvable to the writer.

TOTAL UTILIZATION

1909–10 to 1913–14.—The computations for this early period indicate 81.6 million tons as the total utilization, including the increase in carryover (Table 62, p. 751). A substantially lower figure for utilization in 1912–13 (68.3 million tons in the USSR without Armenia, Georgia, and the Far East) was arrived at by Popov, the head of the Central Statistical Board.[19] That, however, was an early attempt of this type. Popov neglected to consider the increase in carryover—which incidentally was particularly large in 1912–13—as well as the loss. If his figure is adjusted for the average yearly increase in carryover in 1909–13, loss, and requirements of the territories which he did not include, but with no changes in his feed allowance, his utilization figure for 1912–13 becomes equivalent to about 73.5 million tons. Clearly he was far below the mark in his appraisal of feed use (about 12.5 million tons for the incomplete territory). The principal study on feed use was released long after Popov's computation had been made.

The total as here computed equals the figure accepted by the Gosplan as the trend value for 1913; i.e., it is actually somewhat higher than the Gosplan's estimate of the average 1909–13 crop.[20] The Gosplan possibly would have revised its output figure upward had it had all the data available to the present writer. But some utilization items may also have been overestimated here. For example, the official figure on per capita food consumption by the rural population (pp. 750–51) may possibly have been based primarily on data for areas of particularly heavy eaters of bread. Eighty million tons or somewhat more is, in any case, the figure which suggests itself with great certainty for the average utilization and output of grain in the last pre-Revolution years.

1927–28.—Total utilization including the change in carryover in 1927–28 is shown in Table 62 at 73.1 million tons; it is strictly in agreement with the computations of the Gosplan.

1932.—Total utilization (with no provision for possible change in carryover) in 1932 works out to 64.5 million tons, a reduction of 9.4 million tons from the relatively prosperous status of 1927–28. The largest part of the saving came out of livestock feed, but men, too, ate less, not only in terms of grain but even in terms of grain products. In spite of the very precarious supplies, more was exported and more was also used for industrial purposes than in 1927–28, the greatly increased proportion of the crop in government hands permitting both.

1933–34 to 1936–37.—All items except seed and exports showing increases from the low of 1932, the total direct utilization in those still very precarious years is here estimated at 4.4 million tons less than that of 1927–

[19] P. I. Popov, "Grain Balance," *Agriculture on the Path to Recovery* (Moscow, 1925), pp. 18–19.

[20] *1st Plan*, I, p. 144, and *Control Figures of the National Economy USSR for 1928–29*, Gosplan (Moscow, 1929), pp. 408 and 414.

28. The difference rises to about 6 million tons if an adjustment is made for the growth of population. The great reduction in horse numbers accounts for most of the decline.

1938.—Total direct utilization in 1938 as here estimated increased by slightly more than 10 million tons from the average of 1932–33 to 1936–37, and was about 6 million tons above that of 1927–28. But, after all, the period 1933–34 to 1936–37 was a poor one, to a large extent one of starvation. As compared with 1927–28 there was an increase in population of almost 20 million, which created the need for almost 5 million tons of additional grain. That feed use in 1938 is assumed to be almost equal to that of 1927–28 appears conspicuously inconsistent with the great reduction in horse numbers and the increased mechanization of farm power, and with the reduced output of animal products. One justification for the assumption, however, is the fact that socialized agriculture uses its feed less efficiently than did the individual peasants.

NOTE K

BREAD-FLOUR MARGINS

The relationships among the prices at which the Soviet state sells the various grain products are well worth looking into. They provide an enlightening example of the manner in which monopoly power can be abused even in trade involving articles of prime necessity.

Contrary to the practice in such rich countries as the United States, the rural population of poor countries commonly bakes its own bread. To buy ready-made bread is particularly uneconomical for the kolkhozniki, whose total reward for a day's work for their kolkhozy was equivalent to only a few kilograms of grain before the war and is considerably less now (pp. 694–98). It is especially uneconomical if the bread is made by city bakers whose wages, even normally, are two to three times as high as those of farm workers. With normal price relationships among grain, flour, and bread, the kolkhozniki and most other rural dwellers would buy grain, have it ground in a custom mill, and bake the bread in their homes, as the free peasants did in former times, and as peasants still do in countries similar to the USSR.

Such a practice is impossible now. The state refuses to sell any grain but oats, and has inverted the price margins between bread and flour in such a manner as virtually to prohibit home baking. The tabulation on page 761 shows the prices, in kopeks per kilogram, of the various grain products at retail in Moscow, in force for several years beginning January 1, 1935.

Bread in the USSR has an unusually low flour content relative to weight (p. 558, n. 39). Nevertheless, at the above retail prices a kilogram of rye bread made of 95-percent-extraction flour, costing 100 kopeks, contained about 162 kopeks' worth of that flour. The other bread-flour relationships were similar. Hence the kolkhoznik, when he was short of bread grain, rather than buy a relatively large quantity of it at once, periodically had to trudge a couple of miles to the railway station, frequently the only place where the state-owned city-made bread was obtainable.

Commodity	Price
Bread[a]	
Rye (95 percent)	100
Wheat (96 percent)	110
Wheat (85 percent)	200
Flour[a]	
Rye (95 percent)	250
Wheat (96 percent)	260
Wheat (85 percent)	340
Feed	
Oats	75
Rye bran	80
Wheat bran	90
Groats or grits	
Millet	300
Buckwheat	500
Farina	600
Pearl barley:	
Low quality	250
Better quality	400
Oats	230
Corn	180
Rice	1,000
Macaroni	500

[a] Percentages refer to flour-extraction rates.

There is a great deal more evidence of abnormal Soviet conditions in the few figures compiled above—evidence of great deficiency as well as abuse of monopoly power. Wheat bread of 85 percent extraction flour has been made a luxury by fixing its price almost twice as high as that for the same bread of 96 percent extraction. The wide margin between the two qualities of pearl barley belongs in the same category; the low-grade pearl barley is not very palatable. Prices of all kinds of groats and of macaroni were also too high relative to bread of 96 percent extraction. The price system largely compelled the consumer to eat no other grain product but the coarsest, water-heavy bread, produced by state bakeries.

Up to the end of 1947 the situation had not changed in the slightest in all those respects since 1935.

NOTE L

SUGAR BEETS IN ALTAI KRAI

Precipitation in the Altai krai is very inadequate for obtaining satisfactory yields of sugar beets, but this is a minor limitation compared with the shortness of the growing season (120 to 130 days). In 1936, thus far the best year for sugar beets in the Altai, they yielded only 13.5 tons per hectare—considerably less than the country-wide average. The average of 3.9 tons per hectare in 1937 was only about a quarter of the all-Soviet yield. The great year-to-year variations in output are another serious handicap. The total harvest was 357,500 tons in 1936, but only 101,800 tons from the same acreage in 1937.

Producers in the Altai receive 50 percent more for their beets than the producers in the principal sugar-beet regions. But this in no way compensates for the low yields, especially since part of the extra price merely covers the additional cost involved in the much longer hauls to delivery points, and since, because of the short growing season, the cultivation and especially the harvesting of the beets interfere with operations in grain.

[1] Most data are from A. Silin, "Results and Future of Sugar-Beet Growing in Altai Krai," *Socialist Agriculture*, October 1940, pp. 68–83.

So far as concerns the processing of the beets, the higher price paid to producers is only one of several causes of very high costs of sugar production in the Altai. Others are the large year-to-year variations in production, and the high cost of transporting the beets from delivery points to factories. Owing to the climate, sugar-beet production must be spread very thinly over the krai. Before the war the huge territory had only two sugar-beet factories. Incidentally, even the small proportion of the land that was in sugar beets at that time—2.4 percent of the cropped plowland of the kolkhozy growing sugar beets, or 0.27 hectare per worker in these kolkhozy —was believed too large and to have adversely affected the timely harvesting, and consequently the yields, of grain.

Although the average distances from the farms to the delivery points were unusually long, only 12.9 percent (by acreage) of the beets were delivered directly to the factory in Altai krai, as against 67.8 percent in Kiev krai—apparently in 1936–38. The average haul by railway or on the Ob River, paid for by the factories, is very long. Moreover, at the height of this traffic, the river is shallow and part of the beets have to be taken from the delivery points to the factories direct by truck at a cost which, outside of the USSR, would be considered prohibitive.

Silin, the authority for most of the above information, unfortunately neglected to mention the total cost of the beets to the factories, and the production costs of sugar, but the latter costs must be several times those in the principal sugar-beet areas. Although the complete inadaptability of that area for sugar beets, and consequently the very high production costs of sugar, were obvious from the data of the author, he stated (p. 69) that "sugar beets have gained a strong foothold in the kolkhozy and sovkhozy of the sugar-beet zone of the krai."

NOTE M

LIVESTOCK NUMBERS, 1939–41

Only scattered data are available on the livestock herds in 1939–41. They consist of (1) complete data for the collectivized livestock of the kolkhozy in each year, (2) the total herds on January 1, 1941, without subdivision by owners, and (3) the herds of the sovkhozy before the war. None of these figures was subdivided by age and sex, except that for 1941 the total number of cows was stated. The information on the sovkhoz herds, which may be assumed to pertain to the end of 1940, did not include a figure for horses. The reasons for accepting the evidence on the productive herds of the sovkhozy as pertaining to the herds of both the sovkhozy and the koopkhozy are stated on page 261, note 70. The data on 1941 total livestock were apparently not released before 1945,[1] and those on sovkhoz

[1] V. S. Nemchinov, *Agricultural Statistics with the Principles of General Theory* (Moscow, 1945), p. 133. The smallness of herds in Nemchinov's statement convinces one that they pertain to the pre-1939 territory. S. F. Demidov's figures for January 1, 1940 (*Development of Agriculture in the Postwar Five-Year Period*, Moscow, 1946, p. 122) are entirely out of line with Nemchinov's, and obviously pertain to an enlarged territory. This does not prevent the vice-president of the Gosplan from claiming large increases since January 1, 1935 (his 1935 data pertaining to the pre-1939 territory) or even from computing the average yearly percentage increases over the five-year period.

livestock not before the end of 1946.[2] All the estimates of the writer, prior to receipt of the official data, were moderately higher than the latter.

Fortunately, S. F. Demidov,[3] in endeavoring to prove the progress of collectivized animal husbandry, adduced as evidence the increase in the proportion of collectivized livestock to the total collectivized and non-collectivized kolkhoz livestock from 1938 to 1940. From these data, the productive livestock of the kolkhozniki on January 1, 1940, can be computed. For all other data estimates had to be made.

The following factors have been considered with reference to total herds for the estimates in Table 65:

Cattle: Heavy slaughterings in the fall of 1938 made necessary by the poor 1938 crop; they were reflected in the increase of the meat output from 1937 to 1938 by almost one million tons, or nearly 40 percent.

Hogs: The same as for cattle; also reduced breeding in 1938–39.

Sheep and goats: Much smaller effect of the poor 1938 crop, owing to the fact that on January 1, 1938 the herds in the principal sheep regions were far below the normal carrying capacity of the pastures.

Horses: Considerable drafts of horses into the army in 1940.

Demidov's data implied large declines in cattle and hogs of the kolkhozniki from January 1, 1938 to January 1, 1940—by 4.3 million and 3.4 million head respectively, or 20 and 27 percent. The declines were caused by a reversal of the former government policy of encouraging the expansion of kolkhoznik livestock holdings (pp. 346–48), the maintenance of which is greatly dependent on roughage and feed grain received from the respective kolkhozy. Since the collectivized livestock herds of the kolkhozy were even increased during 1938, the kolkhozniki had to bear the whole brunt of the poor harvest. In the expansion of the kolkhoz livestock before 1938, sales of young stock by the kolkhozy and sovkhozy to the kolkhozniki played an important role. Such sales each time were specifically permitted (in the case of the kolkhozy) or ordered (in the case of the sovkhozy) by the government. During 1936, for example, the kolkhozniki, owing to the poor crops, lost 3.2 million hogs, but in 1937 this loss was more than made up—to a certain extent with the help of such purchases. To prevent the kolkhozniki from making up for the losses in livestock caused by the poor 1938 crop, it was sufficient to prohibit or to refrain from ordering such sales (chapter xv).

Before 1938, the livestock of "other owners" (workers and employees of sovkhozy and MTS, and city dwellers) was treated like the holdings of the kolkhozniki. It is possible, however, that after 1938 this owner group succeeded more effectively in resisting reversal of the previous policy than did the kolkhozniki.

The growing discrimination against individual peasants, reflected in the Party and government order "On the Measures to Prevent the Communal Land of the Kolkhozy from Being Squandered," leaves no doubt that the small numbers of livestock remaining in their hands also dwindled during 1938–40, possibly at a rate exceeding that of the decline in the herds of the kolkhozniki.

[2] N. Anisimov, *Agriculture in the New Stalin Five-Year Period* (Moscow, 1946), p. 110.
[3] *Planned Economy*, April 1940, p. 19.

Horses in the sovkhozy (including the koopkhozy) were assumed to have remained unchanged in 1938–41.

No substantial year-to-year changes in cow numbers apparently occurred

TABLE 65.—LIVESTOCK BY OWNER GROUPS, 1938–41*
(*Million head*)

Jan. 1	Total USSR	Sovkhozy and koopkhozy	Kolkhozy	Kolkhozniki	Individual peasants and other owners
	Horses				
1938	16.2	2.0	12.5	.8	1.0
1939	*17.1*	*2.0*	13.5	.7	*.9*
1940	*17.8*	*2.0*	14.2	.7	*.9*
1941	17.6	*2.0*	14.4	*.5*	.7
	Cattle				
1938	50.9	3.7	14.8	25.1	7.3
1939	*47.9*	*3.6*	15.6	*21.7*	*7.0*
1940	*48.4*	*3.4*	17.7	20.8	*6.5*
1941	47.4	2.9	20.0	*18.1*	*6.4*
	Hogs				
1938	25.7	2.8	6.3	12.8	3.8
1939	*20.5*	*2.8*	6.6	*8.1*	*3.0*
1940	*22.9*	*2.8*	7.1	9.4	*3.6*
1941	22.3	2.9	8.2	7.8	*3.4*
	Sheep and goats				
1938	66.6	7.0	22.7	30.7	6.1
1939	*67.5*	*6.8*	27.2	*27.2*	*6.3*
1940	*74.0*	*6.8*	33.2	27.2	*6.8*
1941	85.5	6.8	41.9	*29.7*	*7.1*

* See text for sources. Italicized figures are estimates of the writer.

between 1938 and 1941. Cows are not included in Table 65 because no basis seems to be available to apportion their number among the several owner groups in each year.

NOTE N

DEDUCTIONS FROM THE VALUE OF GROSS AGRICULTURAL PRODUCTION (SOVIET SENSE) TO OBTAIN THE VALUE OF PRODUCTS AVAILABLE FOR SALE AND FOR CONSUMPTION IN THE FARM HOME

The same deductions are used for the year 1927–28, the base year of the 1st Plan, and for 1928. The computations for 1938 are made on the assumption of normal weather conditions.

Grain and grain products.—The quantities of seed and feed for 1928, 1932, and 1938, shown in Table 66, are from Table 62 (p. 751). Feed use in

TABLE 66.—DEDUCTIONS FROM THE VALUE OF GROSS PRODUCTION (SOVIET SENSE) FOR SEED, FEED, AND OTHER FARM PRODUCTS USED IN FARM PRODUCTION 1928, 1932, 1937, and 1938*

Commodity	Values (*million rubles at 1926–27 prices*)			
	1928[a]	1932	1937	1938
Total deductions	5,479	4,030	6,246	5,959
Vegetable products, total	5,051	3,771	5,903	5,601
Grain and grain products	1,636	1,239	1,635	1,548
Wheat	208	208	306	306
Other grain	1,263	981	1,259	1,172
Bran	165	50	70	70
Potatoes	525	450	850	750
Oilseeds, oilcake	140	147	168	153
Vegetables	50	35	50	50
Feed[b]	2,600	1,600	2,700	2,600
Seed, etc.[c]	100	300	500	500
Animal products, total	428	259	343	358
Milk	146	93	122	122
Eggs	32	16	21	24
Manure	250	150	200	212

Commodity	1926–27 price (*rubles per ton*)	Quantities of certain items shown above (*million tons, except as noted*)			
		1928	1932	1937	1938
Wheat	61.2	3.4	3.4	5.0	5.0
Other grain	43.4	29.1	22.0	29.0	27.0
Bran	33.0	5.0	1.5	2.0	2.0
Potatoes	25.0	21.0	18.0	34.0	30.0
Milk	62.0	2.2	1.5	2.0	2.0
Eggs[d]	.36	1075	550	700	800

* See text for comments.

[a] Data for 1928 may be assumed to apply also to 1927–28.

[b] Feed other than grain, potatoes, and vegetables.

[c] Seed and unfinished production.

[d] Price in rubles per dozen; quantity in million eggs.

1937 was put at 2 million tons above that of 1938. The output of millfeed was discussed in Appendix Note J. The price of bran was estimated.

Potatoes.—Seed use of potatoes, 1.3 tons per hectare, is from *Economy of Fruits and Vegetables of USSR*, pp. 18 and 68–69. Feed use of potatoes was estimated as follows (in million tons): 1928, 13.5; 1932, 10; 1937, 24; 1938, 20. The residuals of processing potatoes and sugar beets were disregarded.

Vegetables.—The values of food vegetables used for feed were estimated as follows (in million rubles): 1928, 50; 1932, 35; 1937, 50; 1938, 50.

Feedstuffs other than grain, potatoes, and vegetables.—Gross production, from Table 53, p. 669 (the 1937 figure, however, is reduced by 100 million rubles, assumed as the value of the excess over requirements). Roughage used for purposes other than feed is thus included with the feed.

Seed production and unfinished production.—Data are from Table 53. The differences, if any, between the production and utilization of these items in each year are disregarded.

Manure.—An official source put the value of manure at 244 million and 256 million rubles in 1927–28 and 1928–29 respectively.[1] No estimates of manure in subsequent years have come to the writer's attention. Its values for 1932, 1937, and 1938 are estimated at 60, 80, and 85 percent, respectively, of the average of the above figures.

Milk.—A feed use of 7.5 percent of the total milk output is implied in Nifontov's data on total production and human consumption of milk.[2] The quantity of milk thus computed as utilized for calves must have included also waste of milk, if an allowance for waste has been made in the official estimates.

Eggs.—One hundred eighty chickens per year were raised for each 100 available in the spring of 1926–27 and 1927–28—the only years for which such data seem to have been published.[3] The eggs used for hatching are estimated at five times the poultry number in the spring.

NOTE O

DEPRECIATION AND OUTLAY ON NON-AGRICULTURAL MATERIALS

Table 67 sums up the estimates on the depreciation of agriculture's capital investment and its expenditures for materials of non-agricultural origin used in production, totals of which are deducted from the value of production for sale and household consumption in calculating income from agriculture. The estimates have been compiled or made only for 1928, 1932, and 1938. All estimates are at 1926–27 prices.

DEPRECIATION

The Gosplan's figures for the value of the various items of capital investment in rural economy as of the end of 1927–28, and its computation

[1] *Control Figures of the National Economy USSR for 1928–29*, Gosplan (Moscow, 1929), p. 476.

[2] V. P. Nifontov, *Animal Husbandry in the USSR in Figures*, pp. 155, 222.

[3] *Ibid.*, p. 184.

of the depreciation of these items during 1928–29, are used without change for 1928 in Table 67.[1] Although these figures cover forestry and fishing as

TABLE 67.—CALCULATION OF DEPRECIATION OF CAPITAL INVESTMENT IN SOVIET AGRICULTURE, AND OF EXPENDITURES ON MATERIALS OF NON-AGRICULTURAL ORIGIN USED IN PRODUCTION, 1928, 1932, and 1938

(*Million 1926–27 rubles, except as indicated*)

Item of investment or expenditure	1928[a]		1932		1938	
	Total value	Depreciation[b] or expenditures	Total value	Depreciation or expenditures	Total value	Depreciation or expenditures
Depreciation						
Buildings	5,734	255	4,014	181	4,874	219
Melioration and irrigation	893	37	1,132	48	1,346	57
Tractors, trucks, automobiles	52	10	352	59	1,812	302
Other machinery	1,208	82	2,000	200	3,000	300
Horse-drawn vehicles, small implements	2,020	234	1,600	184	1,600	184
Processing equipment	...	...	...	27	...	80
Total	9,907	618	9,098	699	12,632	1,142
Materials						
Motor fuel, lubricants	...	6	...	67	...	333
Spare parts	...	40	...	101	...	300
Fertilizer	...	13	...	40	...	210
Other materials	...	100	...	100	...	100
Total	...	159	...	308	...	943
Total depreciation and materials	...	777	...	1,007	...	2,085

[a] Investment values (as of the end of 1927–28) in 1925–26 prices and depreciation (during 1928–29) from *1st Plan* II, Part 2, pp. 60–62. Investment figures for 1927–28, revised and expressed in 1926–27 prices are available in *Control Figures for the National Economy USSR for 1929–30*, Gosplan (Moscow, 1930), pp. 446–48. This material was discovered after all the computations for this table had been made, and time did not permit recalculation. Had the *Control Figures* data been used the depreciation charges for 1928 would have been 541 million rubles rather than 618 million.

[b] Rates of depreciation used by the Gosplan (percent): buildings, 4.5; melioration and irrigation, 4.2; tractors, 20; other machinery and large implements, 6.8; means of transportation and small implements, 11.5. With few exceptions, noted in the text, these rates were applied to the figures for 1932 and 1938. The slight differences in the categories are to be noted. The Gosplan did not mention automobiles or trucks, but gave the classification "means of transportation . . . ." which may have included the negligible number of those vehicles on farms in 1928.

[1] *1st Plan*, II, Part 2, pp. 60–62. Depreciation of livestock and dwellings is disregarded; the former is taken care of by the reproduction of the herds; dwellings are not considered as investment in agriculture.

well as agriculture, little exaggeration is involved if they are applied to agriculture alone.

Official data on the investment of the *socialized sector* of agriculture at the beginning of the years 1932, 1936, and 1938, are shown in the accompanying tabulation (in million 1926–27 rubles for 1932 and 1936 with depreciation allowed for; in million accounting rubles for 1938 without allowance for depreciation).[2] The extent to which these data were used in arriving at the estimates in Table 67 is indicated in the following discussion. While a number of factors are responsible for the rather marked differences between the figures in the tabulation and those in Table 67, the reader's attention should be drawn to the still substantial role of the private sector in 1932, especially noticeable in a comparison of the socialized and total investments in buildings, other machinery, and horse-drawn vehicles and small implements. By 1938 the private sector was of minor importance.

	1926–27 rubles; depreciation allowed for		Accounting rubles; depreciation not allowed for
Investment item	1932	1936	1938
Buildings for productive use	1,882	4,342	8,334
Melioration and irrigation	1,372	1,659	2,092
Tractors	309	1,288	2,499
Trucks, automobiles	26	543[a]	1,310[a]
Other machinery	1,504	2,278	4,289
Horse-drawn vehicles; small implements	822	1,021	2,476[b]
Processing: buildings and equipment	524	1,196	2,017

[a] Possibly only trucks.

[b] This figure possibly includes more items than those for 1932 and 1936, but apparently corresponds to the figure for 1928 in Table 67.

For both the socialized and private sectors of Soviet agriculture, the values of *buildings for productive purposes* in 1932 and 1938 are taken respectively at 70 and 85 percent of the 1928 value, and the Gosplan's depreciation rate is applied (Table 67).

The official figures for melioration and irrigation in the tabulation above are used as the basis for the estimates in Table 67, since they represent the entirety of these developments in the Soviet Union. However, the following adjustments have been made: the 1938 investment is deflated from 2,092 million accounting rubles to 1,800 million 1926–27 rubles; the figure for 1932 and the adjusted figure for 1938 are each reduced by one-half of their respective increments over the 1928 value (Table 67), to correct them for overvaluation of new investment and for the representation of existing installations, which were merely repaired or restored, as new investment. To the figures thus obtained is applied the 4.2 percent depreciation rate used by the Gosplan.

The value of *tractors, trucks, and automobiles* in Soviet agriculture is

[2] Data for 1932 and 1936 from *Socialist Construction USSR, 1936*, Gosplan (Moscow, 1936), pp. 238–39; for 1938 from *Socialist Agriculture USSR, 1938*, Gosplan (Moscow, 1939), p. 22.

based on per-unit prices too high to be accepted (see Appendix Note C).[3] It was stated (p. 721) that 2,500 1926–27 rubles could be considered a fair average price for each tractor, truck, and automobile, the tractor reduced to units with 15 horsepower. This price has been applied to the number of units—141,000 in 1932 and 725,000 in 1938—to arrive at the values to be depreciated (Table 67). Depreciation is based on the life span of six years accepted in the USSR before the war.

The total values of *other machinery* in 1932 and 1938 for the socialized and private sectors combined were taken as 2,000 million and 3,000 million rubles respectively. A depreciation rate of 10 percent is applied, rather than the 6.8 percent used by the Gosplan. The equipment in 1932, and even more in 1938, consisted of short-lived machinery to a much greater extent than in 1928, and in addition it was used far more intensively and cared for more poorly by socialized agriculture than it had been by private owners. Even the 10 percent rate of depreciation is probably too low.

A value of 1,600 million 1926–27 rubles is assumed for all *horse-drawn vehicles and small implements* in the USSR, including those of the private sector, in both 1932 and 1938, as compared with 2,020 million rubles in 1928. The Gosplan's depreciation rate of 11.5 percent is applied.

The 1st Plan did not give a separate evaluation for *buildings and equipment used for processing*, this being a relatively unimportant item at that time.[4] Depreciation in 1932 and 1938 is put at 27 million and 80 million 1926–27 rubles respectively.

MATERIALS OF NON-AGRICULTURAL ORIGIN

The total consumption of *motor fuel* in agriculture in 1928, 1932, and 1938 is estimated at 0.1 million, 1.1 million, and 5.5 million tons re-

[3] The following tabulation shows the approximate numbers, officially stated values, and computed average prices of tractors and motorized vehicles on farms, in terms of 1926–27 rubles, depreciation deducted, in 1932 and 1936 (the latter year for orientation), and in accounting rubles without depreciation in 1938:

Year	Total	Tractors	Motorized vehicles
	Number (*thousands*)[a]		
1932	141	130	11
1936	562	470	92
1938	725	560	165
	Total value (*million rubles*)		
1932	335	309	26
1936	1,831	1,288	543[b]
1938	3,809	2,499	1,310[b]
	Value per unit (*rubles*)		
1932	2,375	2,380	2,360
1936	3,330	2,740	6,780
1938	5,440	4,460	9,350

[a] Number at beginning of year, plus about one-quarter of year's increase in terms of units with 15 horsepower. Data partly estimated.

[b] Value data possibly for trucks only, of which there were about 80,000 in 1936 and 140,000 in 1938.

[4] The official valuation for 1929, depreciation deducted, is given at 105 million 1926–27 rubles.

spectively.[5] A single price of 55 rubles per ton[6] is applied for each year, and 10 percent of the resultant fuel cost is added to cover *lubricants.*

The returns to the factory from the production of spare tractor parts in 1932, 1933, and 1934 were officially put at 101 million, 116 million, and 145 million 1926–27 rubles.[7] Although these values do not include wholesale and retail margins, the stated figure for 1932 is here accepted as covering that year's outlay on *spare parts* for all machinery on farms (excepting horse-drawn vehicles). The corresponding figures for 1928 and 1938 are taken as 40 million and 300 million rubles. The cost of repairing farm machinery outside of agriculture is disregarded.

No Soviet prices of *fertilizers* have come to the attention of the writer. The values given are based on Polish wholesale prices of fertilizers delivered to stations of buyers in March 1938.[8] These prices, raised 25 percent to cover transportation costs on longer distances in the USSR,[9] were applied to official data on quantities used[10] (see Table 41, p. 495).

The item *other materials* consists mostly of lumber and wood for fuel. The basis for estimating the outlay on this item is the poorest. A uniform outlay of 100 million rubles for all three years is assumed.

[5] According to *National-Economic Plan for 1936*, Gosplan (2d ed., Moscow, 1936), p. 212, the provision of motor fuel for needs controlled by the Commissariat of Agriculture (i.e., all other than sovkhozy) was 5.5 million tons—3.4 million of kerosene, 1.3 million of ligroin (a fuel heavier than kerosene), and .8 million of gasoline. Tractors of the MTS alone consumed 3.2 million tons, aside from fuel used in moving them from place to place (*Socialist Reconstruction of Agriculture*, May 1937, p. 59).

[6] A. M. Markevich, *Inter-Village Machine-Tractor Stations* (Moscow, 1929), p. 100.

[7] *Socialist Construction USSR, 1936*, p. 9.

[8] *Concise Statistical Yearbook of Poland, 1938*, Bureau of Statistics (Warsaw, 1938), p. 230. One Polish zloty was taken as equal to .371 1926–27 ruble. The price of ground natural phosphate is assumed to have been half that of superphosphate.

[9] As an example of the importance of this factor, substantial amounts of fertilizer were shipped to Central Asia all the way from the Kola Peninsula near the Barents Sea.

[10] The 1926–27 price of superphosphate, computed in the stated way, was 53.64 kopeks per kilogram, delivered. The production cost of superphosphate (14 percent P_2O_5) at the Voskresenskii factory, Moscow oblast (the largest in the Union), averaged 68.5 current kopeks in 1933–35. See *Mineral Fertilizers and Insecticides*, May 1935, p. 37.

APPENDIX TABLES FOR CHARTS

APPENDIX TABLES FOR CHARTS

CHART TABLE 1.—INDEXES OF OUTPUT OF BASIC INDUSTRIAL COMMODITIES, 1921–40*

Year	Production (*Million metric tons*)				Index numbers (*Base, 1913 = 100*)			
	Coal	Crude oil	Pig iron	Cement	Coal	Crude oil	Pig iron	Cement
1913.....	28.6	9.2	4.2	1.5	100.0	100.0	100.0	100.0
1921.....	8.5	4.0	.1	.1	29.7	43.5	2.4	6.6
1922.....	9.0	5.0	.2	.2	31.5	54.3	4.8	13.2
1923.....	12.2	5.7	.3	.2	42.7	62.0	7.1	13.2
1924.....	16.2	6.5	.7	.4	56.6	70.7	16.7	26.3
1925.....	17.0	7.5	1.5	.7	59.4	81.5	35.7	46.1
1926.....	27.6	8.8	2.4	1.3	96.5	95.7	57.1	85.5
1927.....	33.2	11.0	3.0	1.6	116.1	119.6	71.4	105.3
1928.....	36.0	12.3	3.4	1.9	125.9	133.7	81.0	125.0
1929.....	41.8	14.5	4.3	2.4	146.2	157.6	102.4	157.9
1930.....	48.8	18.5	5.0	3.1	170.6	201.1	119.0	203.9
1931.....	56.8	22.4	4.9	3.3	198.6	243.5	116.7	217.1
1932.....	64.7	21.4	6.2	3.5	226.2	232.6	147.6	230.3
1933.....	76.2	21.5	7.1	2.7	266.4	233.7	169.0	177.6
1934.....	93.9	24.2	10.4	3.5	328.3	263.0	247.6	230.3
1935.....	109.0	25.2	12.5	4.5	381.1	273.9	297.6	296.1
1936.....	123.7	27.4	14.4	5.8	432.5	297.8	342.9	381.6
1937.....	122.6	27.8	14.5	5.4	428.7	302.2	345.2	355.3
1938.....	132.9	28.9	14.6	5.7	464.7	314.1	347.6	375.0
1939.....	145.9	30.3	15.2	5.2	510.1	329.3	361.9	342.1
1940.....	164.6	30.3	15.0	5.3	575.5	329.3	357.1	348.7

* Data for 1913 from League of Nations, *Report on Economic Conditions in Russia, with Special Reference to the Famine of 1921–1922 and the State of Agriculture.* C 705. M 451. 1922. II. Later years from League of Nations, Economic Intelligence Service, *Statistical Year-book, 1942/44,* 1945. II. A. 5 (Geneva, 1945), and earlier issues. Soviet sources give slightly higher output figures for some of the products in 1939 and 1940.

CHART TABLE 2.—FIVE-YEAR PLANS: SOVKHOZY

(Million hectares and million head)

Item	Sovkhozy[a]		All sovkhozy[b]			
	1928, actual	1933, goal	1932, actual	1933, actual	1937, goal	1937, actual
Cropped plowland	1.4	19.0	13.4	14.1	16.8	12.2
Cattle (June)	.2	8.5	3.5	3.8	6.7	4.5
Hogs (June)	.1	6.3	1.9	2.6	6.4	3.5
Sheep and goats (June)	.7	15.0	7.2	7.7	14.9	9.0

Item	Sovkhozy of the Commissarist of Sovkhozy[c]			Indicated sovkhozy	
	1937, actual	1942, goal	1946, actual	1940, actual	1950, goal
Cropped plowland	7.2	10.0	5.4	8.9[d]	9.9[d]
Cattle (Dec. 31)	2.0	2.6	1.3	3.0[e]	3.5[f]
Hogs (Dec. 31)	1.0	1.4	.4	2.9[e]	3.7[f]
Sheep and goats (Dec. 31)	5.0	8.0	2.7	6.8[e]	9.0[f]

[a] Data for 1928 for all sovkhozy from *Statistical Handbook USSR, 1928*, Central Statistical Board (Moscow, 1929), pp. 158–59. Data for 1933 only for sovkhozy specified in the resolution of the Congress of Soviets, Mar. 17, 1931.

[b] Including the koopkhozy. Data for 1932, 1933 (goal and actual), and 1937 goal from *2d Plan*, I, 431 and 474. The actual 1937 acreage is official; the livestock figures are estimated from available data on herds as of Jan. 1, 1938.

[c] Data for 1937 from *Socialist Agriculture USSR, 1938*, Gosplan (Moscow, 1939), pp. 30, 31, and 33. Goals of 1942 from *3d Plan*, pp. 86 and 198. Data for 1946 from Party resolution of Feb. 28, 1947.

[d] Data for "grain and livestock sovkhozy," from S. F. Demidov, *Development of Agriculture in the Postwar Five-Year Period* (Moscow, 1946), p. 94.

[e] Data for all sovkhozy from N. Anisimov, *Agriculture in the New Five-Year Period* (Moscow, 1946), p. 110. [f] Data for all sovkhozy, computed from *4th Plan*, Section 2.

CHART TABLE 3.—LIVESTOCK NUMBERS BY OWNER GROUPS, JANUARY 1, 1938*

(Thousand head)

Group	Horses	Cattle	Cows	Hogs	Sheep and goats
Sovkhozy (including koopkhozy)	2,021	3,718	1,351	2,809	7,025
Kolkhozy	12,461	14,794	4,207	6,267	22,746
Kolkhozniki	762	25,112	12,917	12,804	30,735
Individual peasants	468	1,472	627	599	2,428
Workers and employees in rural areas	281	4,211	2,465	1,894	2,355
Individual owners in urban areas	228	1,614	1,118	1,344	1,305
Total	16,221	50,921	22,685	25,716	66,595

* Data from *Animal Husbandry USSR, 1916–38*, Gosplan (Moscow, 1940), p. 108.

CHART TABLE 4.—FIVE-YEAR PLANS: AGRICULTURAL PRODUCTION AND INCOME

(Billion rubles at 1926–27 prices)

Year, goal or actual	Gross production			Available for sale etc.[a]	Income from agriculture
	Total	Crops	Livestock		
1913, actual[b]	13.9	...	...	...	...
1927–28, actual					
Official: original[b]	14.5	9.2	5.3	...	8.9
Computed[c]	15.5	9.5	6.0	10.0	9.2
1932–33, goals of 1st Plan[b]					
Basic variant	20.7	13.2	7.5	...	12.5
Maximum variant	22.6	14.5	8.1	...	13.8
1932, actual					
Official[d]	13.1	9.8	3.3	...	8.4
Computed[c]	12.0	8.7	3.3	8.0	7.0
1937, goals of 2d Plan[d]	26.2	18.1	8.0	...	17.6
1937, actual					
Official	20.1[e]	15.1[e]	5.1[e]	...	14.9[f]
Computed[c]	18.4	13.4	5.1	12.2	10.3
1942, goals of 3d Plan	30.5[e]	20.6[e]	9.9[e]	...	23.4[g]
1938, computed[c h]	17.4	12.1	5.3	11.5	9.4
1940, actual					
Official[i] (undefined territory)	23.3	...	...	...	...
Computed[c h] (pre-1939 territory)	17.8	12.4	5.4	11.8	9.7
1950, goals of 4th Plan (enlarged territory)	29.6	...	...	...	...

[a] Available for sale and consumption in farm homes. See description, pp. 674–76.

[b] Data from *1st Plan*, 1, 87, 133, 144, and 158. The value of gross production in 1913 is given (p. 144) only in pre–World War I rubles, here converted to 1926–27 rubles at the percentage increase used in the source for converting the value of 1927–28 production.

[c] Computed by the writer. See chap. xxviii, pp. 668–82, for discussion.

[d] Data from *2d Plan*, I, 427 and 464–65.

[e] Data from *3d Plan*, p. 198.

[f] Data from the official publication *National Income USSR. Its Formation and Computation*, Academy of Sciences USSR (Moscow, 1939), here quoted from *Quarterly Bulletin of Soviet Economics* (edited by S. N. Prokopovicz), March 1941, pp. 114 and 116.

[g] The *3d Plan*, p. 197, did not state the distribution of the total national income expected in 1942 by items except in percent of the total computed in terms of 1937 prices, having been careful not to state the total national income in terms of these prices. In 1937 prices, the income from agriculture amounted to 25.7 percent of the total in 1937 and was expected to be equivalent to 23.5 percent of the total in 1942. The figure for the income from agriculture in 1942 in the chart (23.4 billion rubles) is only an approximation, based on the assumption that, in terms of 1937 prices, the national income was supposed to increase from 1937 to 1942 by 73.2 percent rather than 82.3 percent, the expected increase in terms of 1926–27 prices. The national-income goal in terms of 1926–27 prices was correspondingly reduced to 164.9 million rubles. Of this amount 14.2 percent has been assumed to have been the expected income from agriculture according to the Plan. The percentage was obtained by reducing 15.6, the percentage that the official income from agriculture was to total national income in 1937 in 1926–27 prices, by 9.1 percent, the percentage by which the proportion of income from agriculture to total national income had to decline from 1927 to 1942 in 1937 prices according to the *3d Plan*.

[h] Normal weather conditions assumed.

[i] Implied in report of N. A. Voznesenskii. President of the Gosplan, to the Supreme Council of the USSR, Mar. 15, 1946, printed in papers of the following day.

CHART TABLE 5.—FIVE-YEAR PLANS: MAJOR CROPS*

(Million tons, except as noted)

Year	Grain	Potatoes	Sugar beets	Sunflower seed	Fibers (*thousand tons*)	
					Cotton: unginned	Flax
1913, official	81.6	...	10.9	...	744	454
1927, official	73.1	42.2	10.1	2.18	718	250
1932, goals of 1st Plan						
Basic variant	99.7	60.0	16.8	3.67	1,677	480
Maximum variant	105.8	67.0	19.6	4.05	1,907	620
1932, actual						
Official	69.9	43.1	6.6	2.27	1,270	500
Computed	66.4[a]	40.0[a]	...	...	...	...
1937, goals of 2d Plan	104.8[b]	73.0	27.6	3.40	2,125	800
1937, actual						
Official	120.0[b]	65.6	21.9	2.08	2,580	570
Computed	96.0[a]	...	...	...	...	...
1938, actual						
Official	94.9[b]	42.0	16.7	1.67	2,478	546
Computed	75.9[a]	...	...	...	...	...
1942, goals of 3d Plan	133.0[b]	100.0	30.0	2.83	3,290	850
1950, goals of 4th Plan[b] (enlarged territory)	127.0	...	26.0	3.70	3,123	800

* Sources in chapters xxii (grain), xxiv (potatoes), and xxiii (others). Except as noted, data are in terms of barn crops.

[a] Barn crops as computed by the writer. See pp. 543–49 and 588–89 for discussion.

[b] In terms of "crop on the root," or "biological crop."

CHART TABLE 6.—FIVE-YEAR PLANS: OUTPUT OF PRINCIPAL ANIMAL PRODUCTS

Year, goal or actual	Meat (*million tons*)	Milk (*million tons*)	Eggs (*billions*)
1927–28, actual			
Official: original[a]	4.21	31.0	10.00
Official: other estimate[b]	3.61	30.1	10.49
1932–33, goals of 1st Plan[a]			
Basic variant	5.51	42.4	17.60
Maximum variant	6.04	47.6	19.50

[a] Data from *1st Plan*, II, Part 1, pp. 330–31. The 1927–28 estimates of the Gosplan for animal products were not used later.

[b] Data from V. P. Nifontov, *Animal Husbandry of the USSR in Figures* (Moscow, 1932), pp. 153, 156.

CHART TABLE 6 (*Continued*)

Year, goal or actual	Meat (*million tons*)	Milk (*million tons*)	Eggs (*billions*)
1932, actual			
Official: original[c]	2.29	20.2	4.20
Official: revised[d]	2.14	...	...
1937, goals of 2d Plan[c]	5.09	32.4	12.25
1937, actual[e]	2.37	26.1	7.5[f]
1942, goals of 3d Plan[e]	6.30	45.0	...

[c] Data from *2d Plan*, I, 233, 466. The figures for eggs were supposed to be only those for consumption. In addition to the meat of the principal animals shown in the chart, the *Plan* (I, 233) provided for the fantastic increase in poultry and rabbit meat from 170,000 tons in 1932 to 764,400 tons in 1937.

[d] Official revision from *Socialist Agriculture USSR, 1938*, Gosplan (Moscow, 1939), pp. 73–74. [e] Data from *3d Plan*, p. 218. [f] Estimated by the writer.

CHART TABLE 7.—FIVE-YEAR PLANS: PER CAPITA MEAT CONSUMPTION*

(*Kilograms per year*)

Year, goal or actual	Total	Rural	Urban
1927–28, actual			
Official: original[a]	27.5	22.6	49.1
Official: other estimate[b]	24.0	18.7	46.3
1932–33, goals of 1st Plan[a]			
Basic variant	30.9	24.7	56.0
Maximum variant	33.8	26.4	62.7
1932, actual[c]	13.5	10.3	21.8
1937, goals of 2d Plan[d]	28.4	21.2	50.0
1937, actual[e]	14.0	8.5	25.5
1942, goals of 3d Plan[f]	32.0	20.0	50.0

* Principal meats, including hog fat. [a] Data from *1st Plan*, I, 106.

[b] Based on data in V. P. Nifontov, *Animal Husbandry of the USSR in Figures* (Moscow, 1932), pp. 220–21, adjusted so that the total would agree with that accepted on pp. 643–45.

[c] Derived from official figure on production of meat in 1932—2.14 million tons, as given in *Socialist Agriculture USSR, 1938*, Gosplan (Moscow, 1939), pp. 73–74; assuming population in mid-1932 to have been 158.1 million (see p. 552), of which 40 million were assumed urban; ignoring foreign trade; and prorating total consumption roughly between urban and rural according to marketings.

[d] Total computed from the planned production (*2d Plan*, I, 233) and expected population (*2d Plan*, I, 427); this figure was then roughly prorated between rural and urban population according to the planned marketings (*2d Plan*, I, 386). The per capita consumption of 32.9 kilograms given as the goal for 1937 in *2d Plan*, I, 391, pertains to all meat, including poultry and rabbits.

[e] Total from *Socialist Agriculture*, Feb. 16, 1939, roughly prorated according to marketings, assuming population in mid-1937 to have been 166 million, of which 50 million were urban.

[f] Figure for total from *Socialist Agriculture*, Feb. 16, 1939, roughly prorated between rural and urban; see note [e] Chart Table 8.

CHART TABLE 8.—FIVE-YEAR PLANS: PER CAPITA CONSUMPTION OF MILK AND MILK PRODUCTS

(Kilograms per year in terms of milk)

Year, goal or actual	Total	Rural	Urban
1927–28, actual			
Official: original[a]	189	183	218
Official: other estimate[b]	185	183	193
1932–33, goals of 1st Plan[a]			
Basic variant	226	207	301
Maximum variant	251	228	339
1932, actual[c]	105	111	85
1937, goals of 2d Plan[d]	169	155	210
1937, actual[e]	132	126	144
1942, goals of 3d Plan[e]	200	182	224

[a] Data from *1st Plan*, I, 106.

[b] Data from V. P. Nifontov, *Animal Husbandry of the USSR in Figures* (Moscow, 1932), p. 222.

[c] Milk production in 1932 (19,620,000 tons) from V. P. Nifontov, *Production of Animal Products in the USSR* (Moscow, 1937), p. 74, minus 10 percent for calves and waste and minus 800,000 tons for export of dairy products; roughly prorated by the writer between urban and rural according to marketings.

[d] Total from *2d Plan*, I, 391, roughly prorated by the writer according to planned marketings.

[e] Total from *Socialist Agriculture*, Feb. 16, 1939, roughly prorated between rural and urban populations on basis of expected marketings. The figures of the source are below those that would correspond to the goals for the output of milk (and meat; see Chart Table 6), but even they are unrealistic.

CHART TABLE 9.—FIVE-YEAR PLANS: OUTPUT OF TEXTILES*

(Million lineal meters except as noted)

Year, goal or actual	Cotton	Woolen	Linen
1927–28, actual	2,742	97	165[a]
1932–33, goals of 1st Plan			
Basic variant	4,360	192	430[a]
Maximum variant	4,700	270	500[a]
1932, actual	2,720	91	130[a]
1937, goals of 2d Plan	5,100	220	600[a]
1937, actual	3,442	105	278
1942, goals of 3d Plan	4,900	175	385
1950, goals of 4th Plan	4,686[b]	159[b]	...

* Data for 1927–28 and goal for 1932–33 (large-scale industry only) from *1st Plan*, II, Part 1, pp. 250–51. Data for 1932 and goal for 1937 (apparently all industry) from *2d Plan*, I, 431. Data for 1937 and goal for 1942 (all industry with minor exceptions) from *3d Plan*, p. 209. Data for 1950 (coverage not stated) from 4th Plan, Sec. 2.

[a] Million square meters.

[b] Raised to 4,786 million meters (cotton) and 168.4 million meters (woolen) by the government order of Dec. 23, 1946.

CHART TABLE 10.—"CLASS" COMPOSITION OF THE PEASANTRY IN 1927*

(Percent of respective totals)

Groups	Households	Persons
Workers on state farms	2.3	1.4
Kolkhozniki	0.7	0.6
Non-socialized groups: total	97.0	98.0
Wage earners	8.0	6.3
Semi-proletariat	20.2	16.0
Average producers	64.9	70.6
Small-capitalist group	3.9	5.1

* *Statistical Handbook USSR, 1928*, Central Statistical Board (Moscow, 1929), p. 88. Only households engaged in rural economy are shown in the table.

CHART TABLE 11.—PRE-COLLECTIVIZATION PEASANT RURAL ECONOMY: GENERAL DATA AND MEANS OF PRODUCTION*

GENERAL DATA

Household group	Value of principal means of production per household (*rubles*)		Households investigated		Average household membership				Source of income (percent of households)	
	Range	Average	Number in group	Percentage distribution	All members	Workers	Man workers	Households without man workers (%)	Entirely non-rural	Chiefly non-rural
1	None	2.7	18,726	3.0	2.6	1.43	.6	42.6	24.6	10.7
2	Under 100	55.1	66,247	10.7	3.6	1.80	.8	30.9	10.9	10.7
3	100–200	158.7	75,659	12.3	4.1	2.03	.9	21.0	3.6	7.9
4	201–400	307.7	161,987	26.3	4.9	2.33	1.1	12.6	1.2	5.0
5	401–800	579.1	189,876	30.9	5.7	2.68	1.3	7.4	.4	3.5
6	801–1600	1,092.5	83,437	13.6	6.5	3.07	1.5	4.7	.2	3.5
7	Over 1600	2,623.3	19,468	3.2	7.3	3.42	1.7	4.4	.7	3.9
Total or average	.....	516.3	615,400	100	5.1	2.45	1.1	13.6	2.8	5.4

MEANS OF PRODUCTION

Household group	Livestock				Machinery and means of transportation					Leasing of means of production[c]			
										Taking on lease		Letting on lease	
	Households without work-stock (%)	Households without cows (%)	Average number of animals per household		Households without plows[b] (%)	Households with plows only (%)	Households with plows and other implements[c] (%)	Average value of machinery	Average value of means of transportation	Households taking (%)	Average outlay per household taking (*rubles*)	Households letting (%)	Average return per household letting (*rubles*)
			Work-stock[a]	Cows				*Percent of value of all means of production*					
1	100.0	100.0	0	0	100.0	0	0	0	0	31.9	14.7	0	0
2	95.2	70.8	.1	.3	93.3	6.4	.3	1.8	1.2	52.1	16.6	1.0	15.0
3	61.6	33.2	.4	.7	67.7	30.9	1.4	2.4	3.6	50.2	17.3	5.1	14.7
4	24.8	19.5	.9	1.0	31.1	62.2	6.7	3.8	5.7	39.7	14.2	13.1	16.4
5	9.4	9.4	1.2	1.3	11.2	65.3	23.5	5.7	6.1	36.0	13.5	21.0	21.1
6	5.2	5.9	1.7	1.7	5.4	42.3	52.3	9.0	5.7	35.8	16.9	31.3	33.6
7	10.0	7.8	2.3	2.5	10.5	25.7	63.8	9.7	3.9	32.6	25.4	37.4	70.9
Average	31.3	23.8	1.0	1.1	34.1	47.5	18.4	6.8	5.4	40.2	15.4	16.1	26.7

[*] Survey of 615,400 households in 1927, *Statistical Handbook USSR, 1928*, Central Statistical Board (Moscow, 1929), pp. 95, 100, 144–47. Distribution by sources of income is based on a larger sample—654,400 households.

[a] In terms of horses. [b] "Plows" includes any plowing implement. [c] Excluding simple implements such as sickles.

CHART TABLE 12.—PRE-COLLECTIVIZATION PEASANT RURAL ECONOMY: LAND TENURE AND OPERATION*

Household group	Land tenure								Land operation		
	Allotment arable land		Arable land and meadows taken on lease			Arable land and meadows let on lease			Cropped plowland		Average meadow land per household (*ha.*)
	Average per household (*ha.*)	Households without (%)	Households taking arable land (%)	Households taking meadows (%)	Average area taken per household renting (*ha.*)	Households letting arable land (%)	Households letting meadows (%)	Average area let per household letting (*ha.*)	Average per household (*ha.*)	Households with less than 0.1 ha. (%)	
1	2.5	23.4	3.2	1.2	1.3	34.7	9.9	2.7	.8	45.3	.3
2	3.7	12.0	6.2	1.7	1.1	32.7	6.6	2.9	1.5	20.6	.5
3	4.5	4.9	7.9	3.6	1.3	20.9	3.3	2.8	2.2	7.8	.8
4	5.6	2.1	12.9	6.4	1.7	11.3	1.5	2.6	3.3	2.9	1.1
5	6.7	1.2	21.4	9.6	2.3	6.3	.9	2.7	4.7	1.4	1.4
6	8.8	1.4	32.0	11.5	3.9	5.1	.7	2.7	6.9	1.3	1.6
7	11.0	3.9	39.2	11.7	8.2	7.0	.8	7.4	9.4	4.8	1.7
Average	6.1	3.8	17.3	7.2	2.8	13.0	2.2	2.8	4.0	6.1	1.2

* Source as in Chart Table 11, pp. 108–09, 111–12, and 143–44.

CHART TABLE 13.—PRE-COLLECTIVIZATION PEASANT RURAL ECONOMY: LABOR*

Household group	Households hiring labor (%)	Percentage distribution of households hiring labor by number of days per year of hired labor					Households selling labor (%)	Households exchanging labor[a] (%)	Percentage distribution of households selling labor by number of days per year of sold labor				
		25 days or less	26–50 days	51–75 days	76–150 days	Over 150 days			25 days or less	26–75 days	76–150 days	151–300 days	Over 300 days
1	4.7	83.0	6.4	2.6	4.4	3.6	58.0	6.8	13.2	20.8	23.4	33.5	9.1
2	8.3	84.4	7.9	2.4	3.2	2.1	58.4	13.8	23.0	24.7	21.4	23.5	7.4
3	11.1	83.5	7.3	2.6	4.0	2.6	48.2	11.2	29.8	25.8	18.6	20.2	5.6
4	15.6	79.6	8.4	2.9	5.7	3.4	36.6	6.4	35.9	24.8	16.6	18.0	4.7
5	23.0	70.5	10.0	3.8	9.1	6.6	28.0	3.8	36.5	23.2	16.2	19.0	5.1
6	34.0	56.5	12.3	5.3	13.3	12.6	20.4	2.5	35.9	21.5	14.6	21.3	6.7
7	51.1	36.3	13.0	7.6	17.2	25.9	11.5	1.5	37.6	22.4	13.2	19.9	6.9
Average	19.8	68.0	10.1	4.1	9.4	8.4	35.4	6.4	31.6	24.1	17.8	20.7	5.8

* Source as in Chart Table 11, pp. 100–103.

[a] In exchange for use of land, machinery, etc. It is not clear whether or not the households supplying labor in exchange for land, machinery, etc., are included in the totals of households selling labor, but they certainly are included among the households distributed by the amount of labor sold.

CHART TABLE 14.—PRINCIPAL PRICE INDEXES, 1925–26 TO 1928–29*

(Prewar bases)

Year	Agricultural products				Industrial products	
	Paid to producers		Wholesale	Retail	Wholesale	Retail
	Plan procurers	All procurers				
1925–26	146.3	158.8	171.3	194	200.9	221
1926–27	133.9	149.3	156.6	186	196.6	210
1927–28	141.4	156.4	156.7	194	187.7	198
1928–29	157.3	183.3	170.3	223	187.4	203

* Data from *Control Figures for the National Economy USSR, 1929–30*, Gosplan (Moscow, 1930), pp. 578–80. The indexes of prices paid to producers are by the Gosplan; the bases are the averages of the three good-crop years 1910–11, 1912–13, and 1913–14. The indexes of wholesale prices, also referred to as "semi-wholesale," are by the Central Statistical Board; base, 1913. The indexes of retail prices are by the Institute of Business Cycles; base, 1913. Prices of 1928–29 described as preliminary.

CHART TABLE 15.—RETAIL PRICES OF AGRICULTURAL AND INDUSTRIAL PRODUCTS, OCTOBER 1926 TO APRIL 1930*

(Index numbers: 1913 = 100)

Date	Agricultural products		Industrial products	
	Government and co-operative stores	Private trade	Government and co-operative stores	Private trade
Oct. 1, 1926	175	209	217	257
Jan. 1, 1927	173	210	212	257
Apr. 1, 1927	172	214	201	247
July 1, 1927	171	223	192	239
Oct. 1, 1927	168	222	189	236
Jan. 1, 1928	174	238	189	238
Apr. 1, 1928	175	247	189	242
July 1, 1928	177	322	188	244
1928–29				
Oct. 1	190	280	196	244
Nov. 1	192	283	196	248
Dec. 1	194	289	197	251
Jan. 1	196	299	198	256
Feb. 1	197	316	198	259
Mar. 1	201	349	201	263
Apr. 1	203	385	202	276
May 1	205	429	201	285
June 1	210	445	201	288
July 1	207	435	202	291
Aug. 1	205	416	202	295
Sept. 1	203	412	203	302

* Indexes of the Central Statistical Board from *Statistical Handbook USSR, 1928* (Moscow, 1929), p. 725, for October 1926 through July 1928; the indexes of government and co-

CHART TABLE 15 (*Continued*)

Date	Agricultural products		Industrial products	
	Government and co-operative stores	Private trade	Government and co-operative stores	Private trade
1929–30				
Oct. 1	203	426	204	315
Nov. 1	203	436	205	334
Dec. 1	204	450	208	357
Jan. 1	206	480	209	372
Feb. 1	203	509	208	378
Mar. 1	202	552	206	386
Apr. 1	202	604	204	399

operative stores were computed by the writer by averaging the separate indexes. From Oct. 1, 1928, indexes of the Gosplan (former indexes of the Central Statistical Board) from *Economic Review*, March 1930, p. 189.

CHART TABLE 16.—PRODUCERS' PRICES OF FARM PRODUCTS, 1924–25 TO 1928–29*

(*Index numbers: 1909–13 average = 100*)

Item	1924–25	1925–26	1926–27	1927–28	1928–29
Total index	132.8	143.7	136.9	142.8	155 7
Crops	134.6	133.7	117.2	124.2	139.8
Grains	137.0	137.5	108.0	115.0	138.1
Oilseeds	89.3	94.5	100.4	116.9	128.0
Technical crops[a]	143.0	138.3	135.4	139.5	144.7
Animal products	134.4	159.8	171.5	174.7	182.0
Foodstuffs	123.8	159.8	171.2	173.0	184.3
Raw materials	143.2	159.7	171.9	177.7	177.8

* *Economic Review*, July 1929, p. 190. Prices paid by plan procurers only; July–June years. These indexes differ in base and other respects from the producers' prices in Chart 14.

[a] Excluding oilseeds.

CHART TABLE 17.—GROSS AGRICULTURAL PRODUCTION AND SPECIFIED CROP ACREAGES, 1920–29

(Million hectares, except as noted)

Year	Production[b] (billion pre-1914 rubles)	Cropped plowland[a]							Sown grasses
		Total	Grain	Non-grain	Potatoes	Technical crops (thousand hectares)			
						Cotton	Flax	Sugar beets	
1920	6.42	97.2	87.0	10.2	3.7	...	885	196	...
1921	5.46	90.3	79.8	10.5	3.8	...	938	221	...
1922	7.84	77.7	66.2	11.5	3.9	70	1,027	182	...
1923	8.33	91.7	78.6	13.1	4.3	221	1,125	264	...
1924	8.80	98.1	82.9	15.2	4.7	447	1,284	379	1.5
1925	10.64	104.3	87.3	17.0	5.0	591	1,576	534	1.6
1926	11.17	110.3	93.7	16.6	5.2	654	1,566	538	2.2
1927	11.00	112.4	94.7	17.7	5.5	802	1,581	665	2.7
1928	11.27	113.0	92.2	20.8	5.7	971	1,736	770	3.6
1929	10.73	118.0	96.0	22.0	5.7	1,055	2,054	771	4.6

[a] *Data from Socialist Construction USSR, 1936*, Gosplan (Moscow, 1936), p. 280. Data for flax include oil-flax.

[b] Gross agricultural production for fiscal years beginning October of indicated year. The data actually comprise crop production of the indicated summer and animal production for the October–September year. Data through 1927–28 from B. Gukhman, "Development of Production 1913–28," *Economic Review*, September 1929, p. 114 (his data are actually Gosplan data). Figures for 1928–29 and 1929–30 computed from *Shifts in Agriculture USSR between the XVth and XVIth Party Congresses*, Gosplan (2d ed., Moscow, 1931), p. 5, and other official sources.

CHART TABLE 18.—LIVESTOCK NUMBERS, 1916 AND 1921–29*

(Million head)

Year	Horses	Cattle	Hogs	Sheep and goats	Total animal units[a]
1916	35.8	60.6	20.9	121.2	151.5
1921	29.6	50.8	19.4	110.9	128.1
1922	24.1	45.8	12.1	91.1	107.3
1923	24.6	52.9	12.9	95.3	116.2
1924	25.7	59.0	22.2	109.0	129.8
1925	27.1	62.1	21.8	122.9	137.0
1926	29.2	65.5	21.6	132.5	145.5
1927	31.6	68.0	23.1	139.7	154.1
1928	33.5	70.5	26.0	146.7	162.1
1929	34.6	67.1	20.4	147.0	158.6

* Summer counts. Data from Nifontov, *Animal Husbandry of the USSR in Figures* (Moscow, 1932), p. 4. See page 620, note 1, on the coverage of livestock by the censuses.

[a] Weighting: horses, 1.9; cattle, 1.0; hogs, 0.4; sheep, goats, 0.12; roughly as in the *Dictionary-Handbook on Social-Economic Statistics*, Gosplan (Moscow, 1944), p. 91.

CHART TABLE 19.—GROSS AGRICULTURAL PRODUCTION, CROPPED PLOWLAND, AND ANIMAL UNITS, 1920–29*

(Index numbers: 1928 = 100)

Year	Gross production	Cropped plowland	Animal units
1920	57.0	86.0	....
1921	48.4	79.9	79.0
1922	69.6	68.8	66.2
1923	73.9	81.2	71.7
1924	78.1	86.8	80.1
1925	94.4	92.3	84.5
1926	99.1	97.6	89.8
1927	97.6	99.5	95.1
1928	100.0	100.0	100.0
1929	95.2	104.4	97.8

* Based on data in Charts 17 and 18.

CHART TABLE 20.—SOVKHOZY: FULFILLMENT OF SPECIFIED GOALS DURING 1ST PLAN PERIOD*

Item	Goal	Actual	Actual as percent of goal
Cropped plowland (*million hectares*)	19	14.1	*74.2*
Livestock numbers (*million head; spring and summer counts*)			
Cattle	8.5	3.8	*44.7*
Hogs	6.3	2.5	*39.6*
Sheep	15.0	7.6	*50.7*
Poultry	20.0	0.85[a]	*4.2*
Deliveries[b]			
Grain (*million tons*)	6.5	2.1	*32.3*
Sugar beets (*million tons*)	6.5	0.74	*11.4*
Cotton (*thousand tons*)	110	12.9	*11.7*
Meat (*thousand tons*)[c]	750	97.5	*13.0*
Wool (*thousand tons*)	20	9.2	*46.0*

* Goals, wich are for principal sovhozy only, from resolution of the VIth Party Congress, Mar. 17, 1931; actual data, most of which apply to all sovkhozy, including koopkhozy, from *Agriculture USSR, 1935*, Commissariat of Agriculture USSR (Moscow, 1935), pp. 715–16, 724, 1076, 1233, 1262, and 1352.

[a] Incomplete.

[b] Goal designated "approximate marketings." As actual figures, deliveries to the government were used.

[c] The goals for meat were assumed to pertain to carcass weight. The deliveries in terms of live weight were converted to carcass weight on the basis of an assumed 50 percent yield.

CHART TABLE 21.—KOLKHOZ CROPPED PLOWLAND: TOTAL AREA AND AREA SERVICED BY MTS, 1929–40*

Year	Area (*million hectares*)		Percent serviced by MTS
	Total	Serviced by MTS	
1929	4.2	0	0
1930	38.1	10.4	27.4
1931	79.0	25.3	37.1
1932	91.5	45.1	49.3
1933	93.6	55.0	58.8
1934	98.6	63.0	63.9
1935	104.5	75.7	72.4
1936	110.5	91.5	82.8
1937	116.0	105.8	91.2
1938	117.2	109.3	93.3
1939	114.9	108.0	94.0
1940	117.6	111.1	94.5

* D. Shepilov, "Kolkhoz System of USSR," *Problems of Economics*, January 1941, p. 35.

CHART TABLE 22.—TWILIGHT OF THE INDIVIDUAL PEASANTS, 1928–38*

Year	Number of households (*million*)	Cropped plowland (*million hectares*)	Number of livestock (*million head*)			
			Horses	Cattle	Hogs	Sheep and goats
				June–July count		
1928	24.0	108.7	32.9	69.4	25.6	144.8
1932	9.4	27.1	6.8	15.4	2.2	17.7
1933	8.0	19.6	4.4	9.6	2.2	12.3
1934	6.3	14.6	3.4	9.3	2.7	10.5
				January 1 count		
1935	3.5	6.8	2.1	5.5	1.5	6.3
1938	1.3	0.86	0.5	1.5	0.6	2.4

* Official sources.

CHART TABLE 23.—LIVESTOCK OF KOLKHOZY AND KOLKHOZNIKI, 1928–41*

(Million head)

Year	Horses		Cattle		Hogs		Sheep and goats	
	Kolkhozy	Kolkhozniki	Kolkhozy	Kolkhozniki	Kolkhozy	Kolkhozniki	Kolkhozy	Kolkhozniki
	June–July count							
1928..	0.1	0.3	0.2	0.8	0.1	0.3	0.2	0.8
1929..	0.3	...	0.4	...	0.1	...	0.7	...
1930..	4.4	...	3.6	...	0.9	...	5.6	...
1931..	12.1	...	9.3	...	2.5	...	12.3	...
1932..	10.8	0.4	8.8	12.7	3.2	2.9	12.1	14.6
1933..	10.1	0.4	8.6	14.9	3.0	3.8	12.2	17.3
1934..	9.9	0.4	8.1	17.2	3.7	5.4	14.1	17.8
	January 1 count							
1933..	9.5	0.4	8.8	11.9	3.1	3.1	11.4	11.6
1934..	9.5	0.4	8.4	13.8	2.8	4.4	10.2	11.9
1935..	10.2	0.4	10.3	16.0	3.5	6.8	12.0	14.7
1936..	11.6	0.6	13.4	23.0	5.1	11.9	16.1	21.6
1937..	12.5	0.7	14.5	22.2	5.3	8.6	18.8	22.9
1938..	12.5	0.8	14.8	25.1	6.3	12.8	22.7	30.7
1939..	13.5	0.7	15.6	21.7	6.6	8.1	27.2	27.2
1940..	14.2	0.7	17.7	20.8	7.1	9.4	33.2	27.2
1941..	14.4	0.5	20.0	18.1	8.2	7.8	41.9	29.7
Goal, 1951[a]	10.5		25.9		11.2		68.1	

* Official data, except for kolkhoznik livestock in 1939 and 1941, and kolkhoznik horses in 1940 (see Appendix Note M). Dots indicate data not available.

[a] Slightly incomplete.

CHART TABLE 24.—PRICES IN SPECIFIED KOLKHOZ MARKETS OF ROSTOV OBLAST, AUGUST 1939*

(Percent of price in Rostov)

Product	Taganrog	Millerovo	Tsimlyanskaya
Beef	118.2	72.7	63.6
Milk	153.8	76.9	76.9
Eggs	109.1	81.8	81.8
Cabbage	100.0	33.3	...
Cucumbers	66.7	93.3	43.3
Tomatoes	83.3	26.7	33.3
Apples	45.8	50.0	25.0

* From P. Kagarlitskii, "On Kolkhoz Market Trade," *Problems of Economics*, March 1940, p. 94.

CHART TABLE 25.—CROPPED PLOWLAND: MAJOR CROPS, 1927–39 AND GOALS FOR 1942 AND 1950*

(Million hectares, except as noted)

Year	Total Cropped plowland	Grain	Potatoes	Vegetables	Total technical crops	Sugar beets	Sunflower	Cotton	Fiber flax	Sown grasses
						(Thousand hectares)				
1920	97.2	87.0	3.7	...	...	196	...	...	885[a]	...
1921	90.3	79.8	3.8	...	...	221	...	...	938[a]	...
1922	77.7	66.2	3.9	...	...	182	...	70	1,027[a]	...
1923	91.7	78.6	4.3	...	...	264	...	221	1,125[a]	...
1924	98.1	82.9	4.7	...	...	379	...	447	1,284[a]	1.5
1925	104.3	87.3	5.0	...	...	534	...	591	1,576[a]	1.6
1926	110.3	93.7	5.2	...	...	538	...	654	1,566[a]	2.2
1927	112.4	94.7	5.5	...	...	665	2,833	802	1,581[a]	2.7
1928	113.0	92.2	5.7	2.0	8.6	770	3,905	971	1,364	3.6
1929	118.0	96.0	5.7	2.0	8.8	771	3,620	1,055	1,631	4.6
1930	127.2	101.8	5.7	2.2	10.5	1,036	3,386	1,583	1,749	6.0
1931	136.3	104.4	6.2	2.9	14.0	1,394	4,575	2,137	2,390	7.4
1932	134.4	99.7	6.1	3.1	14.9	1,538	5,306	2,172	2,510	8.2
1933	129.7	101.6	5.7	3.0	12.0	1,211	3,897	2,052	2,395	5.9
1934	131.5	104.7	6.1	2.7	10.7	1,183	3,500	1,941	2,110	5.9
1935	132.8	103.4	7.4	2.6	10.6	1,225	3,309	1,954	2,107	7.2
1936	133.8	102.4	7.6	2.2	10.8	1,256	3,178	2,035	2,149	9.3
1937	135.3	104.4	6.9	2.1	11.2	1,193	3,250	2,092	2,126	9.1
1938	136.9	102.4	7.4	2.0	11.0	1,180	3,144	2,083	1,882	12.7
1939	134.0	99.6	6.3[b]	...	11.1	...	...	...	...	...
1942, goal of 3d Plan	147.4	102.0	...	...	11.5	1,200	3,150	2,115	1,840	22.0[c]
1950, goal of 4th Plan (enlarged territory)	158.4	105.8	...	...	...	1,368	3,700	1,674	2,000	...

* Official data, chiefly from *Socialist Construction USSR, 1936*, Gosplan (Moscow, 1936), p. 280, and *Cropped Plowland USSR, 1938*, Gosplan (Moscow, 1939), various pages. [a] All flax. [b] Figure for 1940, from *Socialist Agriculture*, December 1947, p. 28. [c] Approximate.

CHART TABLE 26.—CROPPED PLOWLAND VS. FARM POWER, 1927–38*

Year	Cropped plowland (*million hectares*)	Farm power in terms of horses (*million*)
1927	112.6	28.2
1928	113.0	29.4
1929	118.0	29.7
1930	127.2	27.0
1931	136.3	24.2
1932	134.4	21.3
1933	129.7	20.6
1934	131.5	21.6
1935	132.8	23.6
1936	133.8	26.0
1937	135.3	26.9
1938	136.9	29.5

* Acreages from *Cropped Plowland USSR, 1938*, Gosplan (Moscow, 1939), p. 11, and other sources. Farm power from Table 40, p. 458; the data for farm power do not include stationary sources of power.

CHART TABLE 27.—YIELDS OF MAJOR CROPS, 1909–13, 1925–39, AND GOALS FOR 1942 AND 1950*

(*Quintals per hectare*)

Year	Grain	Potatoes	Sugar beets	Sunflower seed	Cotton		Flax fiber
					Irrigated	Unirrigated	
1909–13	8.0	76.5	155	7.5	11.7	...	3.6
1925	8.3	76.5	165	7.2	9.5	...	2.8
1926	8.2	82.2	118	6.0	8.5	...	2.4
1927	7.5	75.1	151	7.6	9.6	...	2.4
1928	7.9	81.8	132	5.4	8.5	0.5	2.4
1929	7.5	80.2	81	4.9	8.3	1.4	2.2
1930	8.5	86.3	135	4.8	7.7	0.6	2.5
1931	6.4	72.7	86	5.5	6.8	2.2	2.3
1932	6.6	70.6	64	4.3	6.9	1.6	2.0
1933	6.9	87.1	74	6.0	7.6	0.5	2.3
1934	6.9	83.2	96	5.1	7.3	0.7	2.5
1935	7.4	94.6	132	5.8	10.3	2.7	2.6
1936	6.2	68.0	134	4.7	14.7	3.7	2.7
1937	9.2	95.6	183	6.4	14.5	4.5	2.7
1938	7.4	57.0	141	5.3	14.9	3.6	2.9
1939	8.3	...	177	...	...	...	...
1942, goal of 3d Plan	13	125.0	250	9.0	19.0	6.0	4.6
1950, goal of 4th Plan[a]	12.0	...	190	10.0	19.9	5.0	4.0

* Official data except as noted. The yield of grain in 1909–13 as accepted by the Gosplan until 1930. The yield of potatoes in the same period applies to all pre-Revolutionary Russia; the yield in the territory of post-Revolutionary Russia was somewhat smaller. All other data for 1909–13 from *2d Plan*, I, 467. The grain yields in 1931 through 1939 as computed in this study (see chapter xxii). The yield of irrigated cotton planned for 1950 has been estimated by the writer; the official figure planned for all cotton is 18.4 quintals. The yields of flax in 1925 to 1927 are from *Control Figures of the National Economy USSR for 1928–29*, Gosplan (Moscow, 1929), pp. 409 and 474. The yields of sunflower seed in 1936 and 1938, not released officially, are approximations, implied in the data on total oilseed production reported by Stalin to the XVIIIth Party Congress. [a] Enlarged territory.

CHART TABLE 28.—PRODUCTION OF MAJOR CROPS, 1925–39 AND GOALS FOR 1942 AND 1950*

(*Million tons, except as noted*)

Year	Grain	Potatoes	Sugar beets	Sunflower seed	Fibers (*thousand tons*)			Hay
					Cotton, unginned	Flax fiber	Hemp	
1925	72.7	38.6	8.8	2.22	565	367	483	...
1926	76.6	43.0	6.4	1.54	559	315	431	...
1927	71.7	41.2	10.1	2.13	718	292	511	...
1928	73.3	46.4	10.1	2.13	821	324	518	78.8
1929	71.7	45.6	6.2	1.76	864	361	465	70.1
1930	83.5	49.4	14.0	1.63	1,113	436	414	61.3
1931	66.1	44.8	12.0	2.51	1,290	553	342	75.3
1932	66.4	43.2	6.6	2.27	1,271	498	262	65.3
1933	70.1	49.3	9.0	2.35	1,292	548	234	64.5
1934	72.2	56.2	11.4	2.08	1,172	533	134	60.2
1935	76.6	69.7	16.2	1.92	1,726	551	...	65.2
1936	63.6	51.5	16.8	1.49	2,393	580	...	...
1937	96.0	65.6	21.9	2.08	2,582	570	...	...
1938	75.9	42.0	16.7	1.67	2,478	546	...	...
1939	82.0	...	21.0	...	2,657	...	...	...
1942, goal of 3d Plan	132.8[a]	100.0	30.0	2.83	3,290	850	...	...
1950, goal of 4th Plan (enlarged territory)[a]	127.0	...	26.0	3.70	3,100	800	...	...

* Official sources except as noted. Output of grain in 1931 through 1939 as computed in this study. Output of sunflower seed in 1936 and 1938 obtained by multiplying official acreages by yields computed in the manner stated in the footnote to Chart 17. The 1935 figure for hay is qualified in the source as preliminary. All official data of the early 'thirties uncertain.

[a] Crops on the root.

CHART TABLE 29.—CROPPED PLOWLAND BY GROUPS OF CROPS AND BY MAJOR CROPS, 1928, 1938, AND GOALS FOR 1942 AND 1950*

(*Percent of specified group total*)

Year, goal or actual	All crops				Technical crops			Potatoes and vegetables	
	Grain	Technical crops	Potatoes, vegetables	Feed crops	Fibers	Sugar beets	Oilseeds and others	Potatoes	Vegetables
1928	81.9	7.7	6.9	3.5	38.8	8.9	52.3	73.9	26.1
1938	74.8	8.0	6.9	10.3	43.1	10.9	46.0	78.5	21.5
1942, goal of 3d plan	69.3	7.7	7.0	16.0	42.6	10.4	47.0	77.7	22.3
1950, goal of 4th Plan	66.7	7.5	7.8	17.9	...	...	...	...	...

* Official data.

CHART TABLE 30.—GRAIN: AREA, YIELD, AND PRODUCTION, 1925–39*

Year	Area (*million hectares*)	Yield (*quintals per hectare*)		Production (*million tons*)	
		Official	Actual or corrected	Official	Actual or corrected
1925	87.3	8.3	...	72.7	...
1926	93.7	8.2	...	72.6	...
1927	94.7	7.5	...	71.7	...
1928	92.2	7.9	...	73.3	...
1929	96.0	7.5	...	71.7	...
1930	101.8	8.5	...	83.5	...
1931	104.4	6.7	6.4	69.5	66.0
1932	99.7	7.0	6.6	69.9	66.4
1933	101.6	8.8	6.9	89.8	70.1
1934	104.7	8.5	6.9	89.4	72.2
1935	103.4	8.7	7.4	90.1	76.6
1936	102.4	8.1	6.2	83.0	63.6
1937	104.4	11.5	9.2	120.3	96.0
1938	102.4	9.3	7.4	94.9	75.9
1939	99.7	10.7	8.3	106.5	82.9

* Official data from various sources. Corrected figures as computed in chapter xxii and Appendix Notes G and H.

CHART TABLE 31.—GRAIN AREAS BY KIND 1928 AND 1929*

(*Million hectares*)

Grain	1928	1938	Grain	1928	1938
Wheat	27.73	41.51	Millet	5.69	3.92
Spring wheat	21.55	26.93	Corn	4.39	2.61
Winter wheat	6.18	14.58	Buckwheat	2.92	2.08
Rye	24.64	21.45	Dry legumes	0.97	2.52
Oats	17.25	17.88	Rice	0.22	0.16
Barley	7.29	9.21	Others	1.07	1.05

* *Cropped Plowland USSR, 1938*, Gosplan (Moscow, 1939), p. 11.

CHART 32.—GRAIN UTILIZATION BY ITEMS IN SPECIFIED PERIODS AND YEARS*

(*Million tons*)

Period or year	Total	Food	Seed	Feed	Technical uses	Exports	Loss
Average, 1909–10 to 1913–14.....	80.6	34.6	14.0	19.0	.5	10.5	2.0
1927–28	73.9	38.0	13.0	19.5	1.0	.4	2.0
1932	64.5	33.6	14.0	12.0	1.5	1.4	2.0
Average, 1933–34 to 1936–37.....	69.5	37.0	14.0	13.0	1.7	1.3	2.5
1938	79.9	41.4	14.0	18.0	2.5	1.0	3.0

* Changes in carryover not shown. Data from Table 62, p. 751.

CHART TABLE 33.—PRODUCTION AND GOVERNMENT PROCUREMENTS OF GRAIN, 1927–28 TO 1939–40*

(*Million tons*)

Year	Production	Procurements	Year	Production	Procurements	Year	Production	Procurements
1927–28 ...	71.7	11.0	1932–33 ...	66.4	18.8	1937–38 ...	96.0	32.0
1928–29 ...	73.3	10.8	1933–34 ...	70.1	23.3	1938–39 ...	75.9	31.5
1929–30 ...	71.7	16.1	1934–35 ...	72.2	26.2	1939–40 ...	82.0	35.0
1930–31 ...	83.5	22.1	1935–36 ...	76.6	28.4			
1931–32 ...	66.0	22.8	1936–37 ...	63.6	25.7			

* Barn crops, as accepted in this study, from Chart Table 30. Government procurements (including purchases) from official sources, except for 1936–37 to 1939–40. These are partly estimated but the order of magnitude is unquestionably preserved.

CHART TABLE 34.—COTTON: AREA, YIELD, AND PRODUCTION, 1925 TO 1938, AND GOALS OF THE FOUR PLANS*

Year	Area (*thousand hectares*)			Yield, unginned (*quintals per hectare*)			Production, unginned (*thousand tons*)		
	Total	Irrigated	Unirrigated	Total	Irrigated	Unirrigated	Total	Irrigated	Unirrigated
1925	592	592	...	9.5	9.5	...	565	565	...
1926	655	655	...	8.5	8.5	...	559	559	...
1927	752	752	...	9.6	9.6	...	718	718	...
1928	971	969	2	8.5	8.5	0.5	821	821	0.1
1929	1,055	1,045	11	8.2	8.3	1.4	864	863	1.5
1930	1,583	1,436	146	7.0	7.7	0.6	1,113	1,104	9.4
1931	2,137	1,783	354	6.0	6.8	2.2	1,290	1,212	78
1932	2,172	1,742	430	5.9	6.9	1.6	1,271	1,203	68
1932, goal of 1st Plan									
Basic	1,375	...	...	12.2	...	...	1,680	...	...
Maximum	1,529	...	...	12.5	...	...	1,910	...	...
1933	2,052	1,666	385	6.4	7.6	0.5	1,315	1,294	21
1934	1,941	1,578	352	6.0	7.3	0.7	1,172	1,156	26
1935	1,953	1,583	370	8.8	10.3	2.7	1,726	1,634	93
1936	2,034	1,588	446	11.8	14.7	3.7	2,393	2,275	118
1937	2,124	1,616	508	12.2	14.3	4.6	2,582	2,346	236
1937, goal of 2d Plan	2,040	1,677	363	10.2	12.0	3.0	2,125	2,016	109
1938	2,083	1,570	513	12.1	14.9	3.6	2,478	2,393	185
1940[a]	2,076	...	...	13.0	15.1	...	2,700	...	...
1942, goal of 3d Plan	2,115	1,555	560	15.1	19.0	6.0	3,150	2,811	336
1950, goal of 4th Plan (enlarged territory)[b]	1,700	1,517	183	18.4	19.9	5.0	3,123	3,032	91

* Various official data, chiefly as follows: 1925 to 1927 from *Statistical Handbook USSR, 1928*, Central Statistical Board (Moscow, 1929), p. 207; 1928 to 1932 from *Agriculture USSR, 1935*, Commissariat of Agriculture USSR (Moscow, 1935), pp. 400–402; 1933 to 1936 from G. Morozov, "Results of 1937 and Tasks for Cotton Growing in 1938," *Socialist Reconstruction of Agriculture*, March 1938, pp. 140 ff.; 1938 from *Socialist Agriculture USSR, 1938*, Gosplan (Moscow, 1939), p. 65. Goals of first three plans taken from the respective publications. Goals for 1950 from *Socialist Agriculture*, December 1946, p. 22. Sources are not in complete agreement, as will be seen by comparing figures in this table with corresponding ones in Chart Tables 25, 27, and 28. Furthermore, some minor discrepancies will be noted in this table in acreage-yield-output relationships.

[a] N. Anisimov, *Agriculture in the New Stalin Five-Year Period* (Moscow, 1946), p. 41.

[b] Yield and output in on-the-root terms.

CHART TABLE 35.—SUGAR BEETS: AREA, YIELD, AND PRODUCTION, 1927–39, AND GOALS OF THE FOUR PLANS*

Year	Area (*thousand hectares*)	Yield (*tons per hectare*)	Production[a] (*million tons*)
1927	665	14.5	10.1
1928	770	13.2	10.1
1929	771	8.1	6.2
1930	1,036	13.5	14.0
1931	1,394	8.6	12.0
1932	1,538	6.4	6.6
1932, goal of 1st Plan[b]	960–1,087	17.2–18.0	16.8–19.6
1933	1,211	7.4	9.0
1934	1,183	9.6	11.4
1935	1,225	13.2	16.2
1936	1,256	13.4	16.8
1937	1,193	18.3	21.9
1937, goal of 2d Plan	1,450	20.0	27.6
1938	1,180	14.1	16.7
1939	1,185	17.7	21.0
1942, goal of 3d Plan	1,200	25.0	30.0
1950, goal of 4th Plan (enlarged territory)[c]	1,368	19.0	26.0

* Official data. A yield of 14.5 tons per hectare, the level reached, rather than the actual yield of 15.1 tons, is shown for 1927; the official output figure was correspondingly adjusted. The inconsistency between output on the one hand, acreage and yield on the other hand, is in the original. See *2d Plan*, I, 466–68.

[a] 1st Plan production goals for the years 1928–31 were as follows (in million tons): 10.1, 12.4, 13.8–15.0 (basic and maximum), and 16.1–17.4 (basic and maximum).

[b] The two figures represent the basic and maximum variants.

[c] Yield and output in on-the-root terms.

CHART TABLE 36.—FIVE-YEAR PLANS: FARM LIVESTOCK*

(Million head)

Year, goal or actual	Horses	Cattle	Hogs	Sheep and goats
	Early summer counts			
1927, actual	30.8	66.4	22.6	132.1
1932, goal of 1st Plan				
Basic variant	36.9	79.3	32.7	159.0
Maximum variant	36.9	80.9	34.8	160.9
1932, actual	19.6	40.7	11.6	52.1
1937, goal of 2d Plan	21.8	65.5	43.4	96.0
1937, actual	16.7	57.0	22.8	81.3
	January 1 counts			
1938, actual	16.2	50.9	25.7	66.6
1941, actual	17.6	47.4	22.3	85.5
1943, goal of 3d Plan	22.0	71.5	51.5	140.0
Enlarged territory				
1938, actual[a]	20.2	59.4	32.2	73.6
1941, actual[a]	21.3	55.1	28.2	91.8
1946, actual	10.5	47.0	10.4	69.4
1951, goal of 4th Plan	15.3	65.3	31.2	121.5

* Official data except at noted.

[a] Official USSR data (pre-1939 boundaries) plus rough estimates for added territories.

CHART TABLE 37.—LIVESTOCK ON FARMS, 1928–41*

(Million head)

Year	Horses		All cattle		Cows		Hogs		Sheep and goats	
	Jan. 1	June	Jan. 1	June	Jan. 1	June	Jan. 1	June	Jan. 1	June
1928	....	33.5	....	70.5	....	30.7	....	26.0	....	146.7
1929	....	34.6	....	67.1	....	30.4	....	20.4	....	147.0
1930	....	30.2	....	52.5	....	26.7	....	13.6	....	108.8
1931	....	26.2	....	47.9	....	24.4	....	14.4	....	77.7
1932	....	19.6	....	40.7	....	21.0	....	11.6	....	52.1
1933	....	16.6	....	38.4	....	19.6	....	12.1	....	50.2
1934	15.4	....	33.5	....	19.0	....	11.5	....	36.5	....
	....	15.7	....	42.4	....	19.5	....	17.4	....	51.9
1935	14.9	....	38.9	....	19.0	....	17.1	....	40.8	....
	....	15.9	....	49.2	....	20.1	....	22.5	....	61.1
1936	15.5	....	46.0	....	20.0	....	25.9	....	49.9	....
	....	16.6	....	56.7	....	22.1	....	30.5	....	73.7
1937	15.9	....	47.5	....	20.9	....	20.0	....	53.8	....
	....	16.7	....	57.0	....	23.3	....	22.8	....	81.3
1938	16.2	....	50.9	....	22.7	....	25.7	....	66.6	....
	....	17.5	....	63.2	....	25.2	....	30.6	....	102.5
1939	17.1	....	47.9	....	22.7	....	20.5	....	67.5	....
1940	17.8	....	48.4	....	22.8	....	22.9	....	74.0	....
1941	17.6	....	47.4	....	22.8	....	22.3	....	85.5	....

* Data for 1928 to 1938 from *Animal Husbandry USSR, 1916–38*, Gosplan (Moscow, 1940), p. 4. Data for 1941 from V. S. Nemchinov, *Agricultural Statistics with the Principles of General Theory* (Moscow, 1945), p. 133. Data for 1939 and 1940 estimated; see Appendix Note L. Pre-1939 territory.

CHART TABLE 38.—OUTPUT OF MEAT, MILK, AND EGGS, 1927–28 TO 1940*

Year	Meat[a] (*thousand tons*)	Milk (*thousand tons*)	Eggs (*billion*)
1927–28	3,611	30,106	10.5
1928–29	3,940	30,709	10.2
1929–30	4,473	27,969	...
1930–31	....	24,806	...
1931–32	....	21,635	...
1932	2,138	19,620	4.2[b]
1933	1,722	18,829	3.6
1934	1,509	20,150	4.2
1935	1,969	21,332	5.7 (goal)
1936	2,500[c]	22,822[c]	...
1937	2,370	26,060	7.5
1938	3,303[c]	{28,861[c] {26,000[d]	8.5
1939	....	.....	...
1940	....	30,000[e]	...

* Data for 1927–28 to 1929–30 from V. P. Nifontov, *Animal Husbandry of the USSR in Figures* (Moscow, 1932), pp. 156–57 and 160–61. Subsequent data for meat and milk as follows: 1930–31 to 1936 from Nifontov, *Production of Animal Products in the USSR* (Moscow, 1937), pp. 69 and 74, and other sources; for 1937 from *3d Plan*, p. 218; for 1938 from *Socialist Agriculture USSR, 1938*, Gosplan (Moscow, 1939), Table 90 (the meat figure in this table included poultry, and was corrected on the basis of data in Table 92). Data for eggs as follows: 1932 from *2d Plan*, p. 466; 1933 and 1934 computed from data in *National Economic Plan for 1935* (2d ed.), p. 662; goal for 1935 from *ibid.* Egg production in 1938 estimated on the basis of official data for poultry members; production in 1937 prorated.

[a] Including pork fat, but not poultry or rabbit meat.
[b] Eggs for consumption only.
[c] Preliminary.
[d] At most, in writer's opinion.
[e] Writer's estimate.

CHART TABLE 39.—AVERAGE SLAUGHTER WEIGHTS, 1925–26 TO 1928–29 AND 1934 TO 1938*

(*Kilograms live weight*)

Year	Cattle	Hogs	Sheep	Year	Cattle	Hogs	Sheep
1925–26	376	104	37	1934	236	65	32
1926–27	343	112	42	1935	242	76	33
1927–28	335	111	41	1936	257	89	36
1928–29	334	103	44	1937	258	92	37
				1938	275	89	36

* Data for 1925–26 to 1928–29 (October–September years) from V. P. Nifontov, *Animal Husbandry of the USSR in Figures* (Moscow, 1932), p. 180. Weights apply to animals procured from the socialized sector in the RSFSR. Data for 1934–38 from Boiko, "Let Us Give to the Packing Industry High-Quality Raw Material and . . . . Reduce the Seasonality of Its Operations," *Meat Industry of the USSR*, February 1940, p. 6. Weights apply to animals in obligatory deliveries. Boiko was chief of the livestock procurement organization of the East.

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SOURCES CITED

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Departure from alphabetical order was made in the case of the Five-Year Plan publications and two works dealing with their results. Because of their peculiar importance, both to this study and among Soviet source materials, they are placed in their proper sequence at the head of this list with full English and Russian titles.

To save space, publishing agencies are given only for publications without named authors except where special emphasis was put on the agency, as in certain publications of the Academy of Sciences. The usual distinction between documentary and non-documentary sources cannot be applied to Soviet publications. The State has a monopoly on publishing in the USSR, and no works that may be considered strictly private are issued. Since unauthorized disclosure of information is heavily punishable, the material contained even in signed books and articles must be regarded as official.

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