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SOVIET AGRICULTURAL POLICY, 1953-1962†

This article is devoted to a broad survey of major measures of agricultural policy introduced in the USSR after the death of Stalin. For reasons of space, we concentrate on what we believe to have been the most significant developments, ignoring, in particular, some of the changes in the general area of control of implementation of these measures. After a brief discussion (Section I), of the agricultural heritage left by the late dictator we consider (Section II), the elements of the major policy decision involving the expansion of sown areas into the Virgin Lands and provide a brief evaluation of this program. We then proceed with the discussion on individual policy measures undertaken in two distinct periods which comprise our larger time span. Thus Section III is concerned with developments during the period 1953-1957, while the years 1958-1962 form the subject of Section IV. Our results are summarized in Section V. For convenience a relatively large amount of statistical information is presented in a number of tables appended at the end of the study.[1]

I

Stalin's economic legacy was varied, and in some instances quite substantial. The late dictator bequeathed to his heirs a land that differed vastly from the one which he himself had inherited from Lenin after a brief and remorseless struggle for power in 1924-28. It was a land that could no longer be seriously described as underdeveloped, a land that has been able to achieve remarkably high rates of growth in its industrial production and gross national product since 1928, [2] and a land that would shortly send into outer space the first man-made, and eventually also the first manned, spatial vehicle.

As far as agriculture is concerned, however, the heritage consisted chiefly of problems rather than achievements. To a large extent, the complexity of

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1. For the most part, data in the tables are those shown in official Soviet sources. Existing doubts on comparability or the coverage of the series are indicated in the notes to the relevant tables.

2. For the rates of growth in industrial production see *16*, pp. 295-317. The rates of growth in net national product are discussed by A. Bergson in *5*, p. 1-37.

agricultural issues which faced Stalin's successors in the spring and summer of 1953 was due precisely to the methods applied by the late dictator to achieve the remarkably high performance in the field of industrial growth, lifting the economy largely by its own bootstraps from the doldrums of underdevelopment. The story of Soviet growth from 1928 to 1953 is familiar; briefly, it was financed by forced savings of workers and peasants alike, perhaps more so by the former than we were at first led to believe (3, pp. 256-57). The contribution of the agricultural sector was not, however, inconsequential. In order to secure it, an agricultural system of some 24 million individual peasant households, each with an average crop area of about 11 acres, had forcibly been turned, within a period of twenty-five years, into one of large, and by U.S. standards, giant farms. In early 1950, there were in the USSR some 254,000 collective farms, each with an average sown area of some 1,100 acres, and 4,500 state farms with average sowings of 3,700 acres per farm. (Within that year, the number of collective farms was to dwindle to 121,700 under the impact of the merger program, and average sowings per farm in this sector rose to 2,400 acres). The horse gave way to the tractor and the truck; the scythe and the sickle to the combine. Farm marketings of grain, for Soviet leaders a crucial test and one that had once been used by Stalin to underscore the deficiency of small scale peasant agriculture, rose from 16.5 per cent of gross output in 1928 to 44 per cent in 1952.[3]

These achievements, however, involved severe costs that in many instances proved to be of such magnitude that the achievements were less than sufficient to justify them. For one thing, the drastic collectivization in agriculture left many permanent scars, in addition to the concomitant destruction of whatever agricultural elite existed in the Soviet Union in the late nineteen twenties. With the single exception of hogs, livestock holdings in 1953 were below the levels attained in 1928, and this was also true of the 1949-1953 average yields of major crops (see Tables 4 and 5). To an incredible extent, the economy depended upon its small but relatively highly efficient private sector. While the latter accounted for only 3 per cent of the total sown area in 1953, it produced about two-thirds of the total output of milk and potatoes, about one-half of all meat and vegetables grown in the USSR, and almost seven out of every eight eggs laid by Soviet hens (*33*, pp. 235-8, 240-3, 334-6). The socialized sector, while lagging seriously in the production of these products, as well as in over-all efficiency, functioned nevertheless as a fairly effective supply channel of raw materials and food to industry and urban population. Its share in total government procurements (achieved at the expense of living standards on the farm) was about two-thirds for milk, four-fifths for meat, and virtually all the vegetables and grain (33, p. 92).

3. The cited figure for 1928 is higher than that usually given by official Soviet sources, but the latter refer to a more restricted concept of marketing which is not comparable with that employed by the same sources for 1952, or other years of the plan era.

Thus to paraphrase the apposite expression of that eminent economist, the late Ragnar Nurkse, the Soviet collective farm proved to be far more effective as an instrument of collection than as an institution of collective work. That this was so was not surprising. The very structure of the collective farm, involving payment to labor in the form of residual shares, and the adopted method of farm procurement, which included substantial payments in kind for major machinery inputs, precluded the adoption of modern or even less satisfactory cost calculation. Little incentive was offered to peasants to work on the collective fields rather than in their own garden plots. And even in the domain of collection, much still remained to be desired, in spite of the fact that government grain procurements and seed requirements accounted for perhaps up to two-thirds of total grain output in such densely populated but low yielding areas as the non-blacksoil center (*33*, p. 536-39, 628-35). In 1952, the third largest grain crop yield of Soviet history, and a year with the largest grain harvest in the postwar period up to that time, grain procurements were said to have fallen short of satisfying domestic and export requirements of the state (*20*, v. 3, p. 345).

Living standards of the peasantry declined: between 1928 and 1952 farm income in kind may well have declined by 30-31 per cent,[4] while the terms of trade of the peasantry, measured in terms of conventional but deficient indices, declined by some 30 per cent (*17*, p. 46). This would be the picture with respect to the average peasant; there is every indication that the more representative "median" peasant had suffered a more substantial decline. A recent calculation of per capita consumption of Soviet peasantry (based on incomplete information) reveals that in 1953, they consumed 24 per cent less grain products (in terms of flour), 37 per cent less sunflower oil, 17 per cent less meat and fat, and 23 per cent less milk products than in the precollectivization year 1927-28 (*18*, p. 894).[5]

In the light of the above considerations, Stalin's reported conclusions that the limit of peasant contribution to the national economy had not yet been reached can only be considered surprising. Shortly before his death, he was said to have contemplated the imposition of an additional levy of some 40 billion rubles on agriculture, and it is now known that prices of such machinery as the collective farms were able to purchase in 1951-52 were raised, in many instances by more than 100 per cent (*34*).

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4. As indicated by Bergson's calculations in 3, pp. 327, 337.

5. Basile Kerblay, the author of these calculations, is well aware of the limitations of his data. He relies very heavily on estimates of net agricultural product made by A. Kahan and D. Gale Johnson. These estimates have not as yet been explained in sufficient detail to permit a critical appraisal. It might also be noted that in 1927-28 the per capita consumption of grain products (in terms of flour) was 221 kilograms. Data given in 28, p. 403, show a declining trend in rural per capita consumption of grains from 242 to 229 kilograms between 1923-24 and 1926-27.

II

But the problem confronting the Soviet leaders in 1953 was not one that could have been solved by the application of additional extractive measures. The issue that confronted them had aptly been called by Abram Bergson the "Bukharin issue in a new guise."[6] That this was indeed the case must have been brought to the attention of Soviet leaders by the consideration of various official indices: gross output of industry by 1952 exceeded the prewar level of 1940 by not less than 125 per cent, while that of agricultural output showed a rise of only 10 per cent in the comparable period.[7] In 1949-52, approximately 20 billion (old) rubles worth of investment goods were annually poured into the agricultural sector, while output, as we now know, remained virtually stationary (see Tables 1 and 8).

While the precise motives for the decision to undertake a major rehabilitation scheme in agriculture must remain conjectural, one can list several reasons for the undertaking of such a program. Thus, the incredibly high gross capital output ratio in 1950-52 was clearly intolerable, given the over-all scarcity of investible resources. Understandably too, the new government might well have been more concerned about future trends in Soviet living standards. In the immediate postwar period, these had been rising rapidly from the very low wartime levels, and by 1950 the per capita purchases of goods surpassed the prewar level by some 26 per cent.[8] But as far as food was concerned, the continuation of these trends was made problematical by the virtual stagnation of farm output; moreover, low levels of animal production offered little prospect for a significant improvement of Soviet diets. The farm sector, therefore, might well have been viewed by the top leadership as the major impediment to future growth of consumption, and possibly also of the rate of growth in the gross national product.

The problem was also not devoid of international ramifications. Low living standards and monotonous starchy diets might well have been understandable during the great industrialization drive, but they clearly did not fit well with the image of the second-ranking industrial power of the world, and one that wished to present itself as a model of growth techniques that might be attractive to underdeveloped countries. At one time, the iron curtain, including its statistical counterpart, could be relied upon to hide such features from the eyes of inquisitive foreigners. But a large inflow of students and other specialists from the satellite countries (to be supple-

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6. *4*, p. 218. During the industrialization debate of the 'twenties, Bukharin stressed the view that discrimination against the peasants might lead to a reduction of farm output or marketings.

7. Reference is here to official indices, as given e.g., by Khrushchev in *26*, September 15, 1953. The Soviet official index of gross farm output has since been revised; according to the current version, the 1952 gross output exceeded that of 1940 by only 1 per cent. According to *16*, p. 296, the industrial output in 1952 exceeded the 1940 level by only 67 per cent.

8. See the calculations of Janet Chapman in *5*, p. 238.

mented shortly by a corresponding inflow from "noncommitted" underdeveloped countries) would further increase pressure to raise the living standards of the Soviet population. Finally, the Soviet leadership must have been well aware of the fact that the strain of Stalinist methods of industrialization imposed an almost intolerable burden on agricultural sectors of satellite nations in Europe as well as in China, and that these countries might shortly require substantial shipments of Soviet grain.[9] The need to increase exportable grain reserves would be augmented further by a desire to exploit various possibilities which might present themselves to the USSR in the field of foreign aid.

Thus, considerations of past trends and of not too distant a future suggested the necessity of raising the volume of farm output, preferably in the short run. Given the existing institutional arrangement and the novelty of the policy, the task was truly colossal and called for a careful examination of alternative courses of action. One of these was a program designed to increase farm productivity in the socialist sector on the existing agricultural area. A half-hearted attempt of this sort, however, had just been made within the framework of the Fifth Five Year Plan, but failed, partly as a result of insufficient allocation of resources.[10] One might, however, repeat the experiment with greater allocation of state investment funds to agriculture generally and a concomitant increase in the supply of non-farm inputs, such as farm machinery, fertilizers, and weed killers. This in turn might require the expenditure of additional investment funds designed to increase capacity, especially that of the chemical industry. The program would thus be costly, and the recent experience with high capital output ratios in agriculture in 1950-52 must have cast some doubts upon its efficacy, should the injection of additional funds occur within the existing and inefficient institutional framework. To alleviate the risk of waste of additional resource inputs, drastic changes in the existing structure of the collective farm, designed to eliminate some of its most glaring inefficiencies, might well have been in order.

Furthermore, the financial position of the farm would have to be strengthened, in order to make work in the socialist sector more attractive to the peasant. The task of luring him away from the private household plot would call for changes in the existing price systems, in procurement and planning procedures, as well as in the prevailing tax structure. The very nature of the program demanded a more efficient performance on the part of many millions of collective farm households and of a million (or two) farm managers and government officials associated with agriculture.

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9. According to a recently published memorandum by Krushchev, dated January 22, 1954, "export requirements" of grain rose from about 1.3 million tons in 1953 to about 4.8 million tons in 1954 (cf. *20*, vol. 1, p. 86).

10. For an appraisal of the agricultural goals of the Fifth Five Year Plan stressing these points, see 29, especially pp. 501-05. It will be borne in mind that the article just referred to was written on the basis of limited evidence available at the time.

Yet, the consistent experience of the Soviet farmer, both in the short and in the long run, had until now been that of a second-class citizen. And farm managers and government officials had in the past performed most efficiently in the domain of collection rather than that of production.

In a sense, therefore, the alternative just discussed amounted to a prescription of "balanced growth" for Soviet agriculture. As the only course of action to be undertaken, it was hence open to the familiar objection that it required a massive and protracted utilization of precisely those factors or inputs (efficient management, fertilizers, consumer goods acting as incentives for increased supply of effort) which were not just then in relatively abundant supply. Moreover, the "balanced growth" alternative would also call for drastic institutional reforms in agriculture, eliminating some of the rigid forms and procedures that had been developed by Stalin to deal with an entirely different set of problems. Governments succeeding a strong and well established dictatorship, however, are likely to devote much of their attention to the question of domestic stability. Rapid abandonment of, or basic changes in, institutions and procedures that were familiar and cherished (if only by officials) might well have been viewed as endangering not only the internal cohesion of the party but also the stability of the Soviet regime. Under the circumstances, and provided that other alternatives were available, the rejection of a program or programs relying exclusively on "balanced growth" would be reasonable even on the part of a government unanimously committed to structural reforms in agriculture. While we do not pretend to expertise in Kremlinology, it is quite clear that no such unanimity among the top Soviet leaders existed in the spring and summer of 1953.

An "unbalanced growth" alternative did exist, in the form of a possible expansion of grain into areas that are now known as the "Virgin Lands" of north Kazakhstan and southern Siberia, and it was characterized by many attractive features. First of all, both Kazakhstan and Siberia were sparsely settled and were thus able to supply in 1953 more than 50 per cent of their grain output to the State. A further expansion of grain acreage here might therefore supply the State with as much as 62-67 per cent of the additional grain harvest (*20*, v. 1, pp. 89-91). This would immediately relieve the stringency of grain shortages which appeared in 1952-53 (in the latter year, grain procurements fell short of satisfying domestic requirements by some 2 million tons, and the 1954 grain export plan had to be reduced by 1.7 million tons or 35 per cent). [11] Since wheat would be the main crop grown on the Virgin Lands, it would be possible to divert some of the wheat acreage in the old farming areas to the production of feed grains, the procurements of which fell from 10.2 million tons in 1940 to 6.4 million tons in 1952 (*20*, v. 1, p. 87). Eventually, acreages currently under grains in the older areas might also be diverted to other feed or technical crops.

11. Calculated on the basis of data in *26*, December 16, 1958 and *20*, vol. 1, p. 86.

The "virgin" characteristic and the topography of the New Lands offered good possibilities for extensive use of farm machinery, such as heavy tractors and combines. The land could be settled without drastic immediate changes in the existing organizational structures, and the entire program (in spite of its absolutely large size) could still be properly regarded as a limited one, involving a concentrated use of scarce capital and management resources over a relatively small area. Hence, it was a type of program in which the Soviet economy excels, if we may judge by its success in the development of heavy industry and its ultimate performance in outer space. In the *short* run, therefore, the success of this venture was just about guaranteed.

Long run prospects, however, were quite different since much depended upon the vagaries of niggardly and capricious nature. Much of the New Lands area suffers from the handicap of light and dust-prone soils, as well as uncertain precipitation and both late and early frosts. The risk of crop failures was high, but greater still was the risk that the New Lands might rapidly be turned into a giant version of the American dust bowl (a danger that was duly, and not surprisingly, stressed by Western commentators—e.g., *12*). Nor was the risk premium the only cost involved. Opportunity costs of the program would also be high, as the Virgin Lands would naturally be granted first priority on the supply of equipment and other materials that might otherwise be used profitably to raise farm productivity in the old agricultural areas.

Yet, the resulting delay need not necessarily be fatal. Undoubtedly, improvements in the old areas were a necessary condition for the achievement of the goal of a permanent and substantial increase in the volume of Soviet farm output as a whole. But as we have just seen, there were many reasons for a slower and more cautious approach to this part of the task. In this context, the New Lands program might be viewed as enabling the government to gain the time needed to devise and implement the various necessary reforms in farm organization and changes in policy approach, while at the same time providing it with enough grain to shorten the time horizon of the earlier part of the program and to smooth the difficulties of that task. In the end, the Virgin Lands might conceivably buy enough time and enough grain so that it would not matter, perhaps, if large parts of the newly cropped acreage might have to revert to their earlier and unproductive state. Given the state of agriculture in 1952, the stakes were clearly high enough to justify the gamble.

There is some evidence to indicate that a tentative decision on a "Grand Design" for a future development of Soviet agriculture, based on the opening up of the Virgin Lands considered as part of the larger scheme of the sort just outlined, may have been taken as early as the September Plenum meeting of the Central Committee in 1953. While it is true that the decision to implement the program was not announced until March of the following year, it is known that specialists from northern Kazakhstan were invited to

present their views and discuss their experiences before the September 1953 Plenum meeting, and N. S. Khrushchev is said to have consulted subsequently with economists and other scientists on the subject (*8*, 1960, No. 12, p. 8). An article published by E. Karnaukhova in a November 1953 issue of the party periodical *Kommunist* might perhaps be regarded as a preliminary version of the ultimately adopted rationale for the undertaking of acreage expansion programs, and Durgin cites evidence to the effect that some plowing operations in the New Lands began late in 1953 (*23*, p. 5; *7*, p. 256). Since extensive preparatory measures were required for sowings of 13 million hectares of land, it is reasonably clear that a meeting of minds among the leadership must have been achieved much earlier than March, 1954.

Before proceeding with the discussion of measures undertaken on an all-Union scale, we might well pause here for a brief assessment of the program. As already noted, its scope was fairly modest, envisaging the plowing up of approximately 32 million acres in 1954-55 (*26*, March 6, 1954), but sights were raised much higher within the short period of only five months. By August 1954 the (apparently) final target for the expansion of crop acreage was fixed at some 69-74 million acres, the whole to be achieved by the end of 1956. Further additions, however, were made in later years, so that by the end of 1961 some 104 million acres were brought under cultivation, expanding the total USSR sown area by a little more than one quarter (*26*, August 17, 1954 and March 6, 1962).

There is little doubt that the calculated risk involved in the decision to develop the New Lands resulted in a success, if this is measured by the gauge of additional grain output. Measured in terms of five year averages, the Soviet grain output rose in the period 1949-53 to 1957-61 by virtually three-fifths, and two-thirds of the increase are attributable directly to the opening up of Virgin Lands, where a rise of 132 per cent was achieved during the same period of time. Simultaneously, the government was able to increase its procurements of grain by 45 per cent on an all-Union scale. The rise in grain collections in the New Lands was even greater than that of output, amounting to not less than 164 per cent (*31*, pp. 442-43, *32*, pp. 374-75). The program, therefore, has paid off in terms of both total and marketable output of the principal crop involved. The government has also acclaimed it as a financial success: it is said that by 1961 the government expended 5.3 billion (new) rubles of additional investment funds for the purposes of acreage extension, while the proceeds of the turnover tax and (state farm) profits resulting from the increased volume of grain procurement and the operations of farm units amounted to over 8.6 billion (new) rubles (*32*, p. 375).

It is, however, quite likely that calculations of this sort fail to take into account the very substantial waste accompanying a crash program of this magnitude, owing to high labor turnover, shortages of repair and other facilities, and the frequent necessity to import machinery or equipment oper-

ators from the older farm areas. The opportunity cost, measured in terms of the proportion of new major machinery allotted to New Lands must also have been high: rough calculations suggest that the area may well have absorbed up to 40 or 50 per cent of all new tractors and grain combines shipped to Soviet agriculture between 1953 and 1961.[12] The program was also costly in terms of construction of new facilities, including elevators and warehouses, and last but not least, housing for labor moving in from the more settled parts of the country. As we have already indicated, the success of the government in persuading people to remain on the farms has been rather limited, in spite of substantial financial inducements proffered. The Kazakh republic, for example (where about three-fifths of the total new acreage is located), was reported to have trained 104 thousand tractor drivers and combine operators in 1960 and 1961, while absorbing 54 thousand "permanent" migrants for similar openings. Yet, during these two years, 180 thousand equipment operators were said to have left state and collective farms located in the republic.[13]

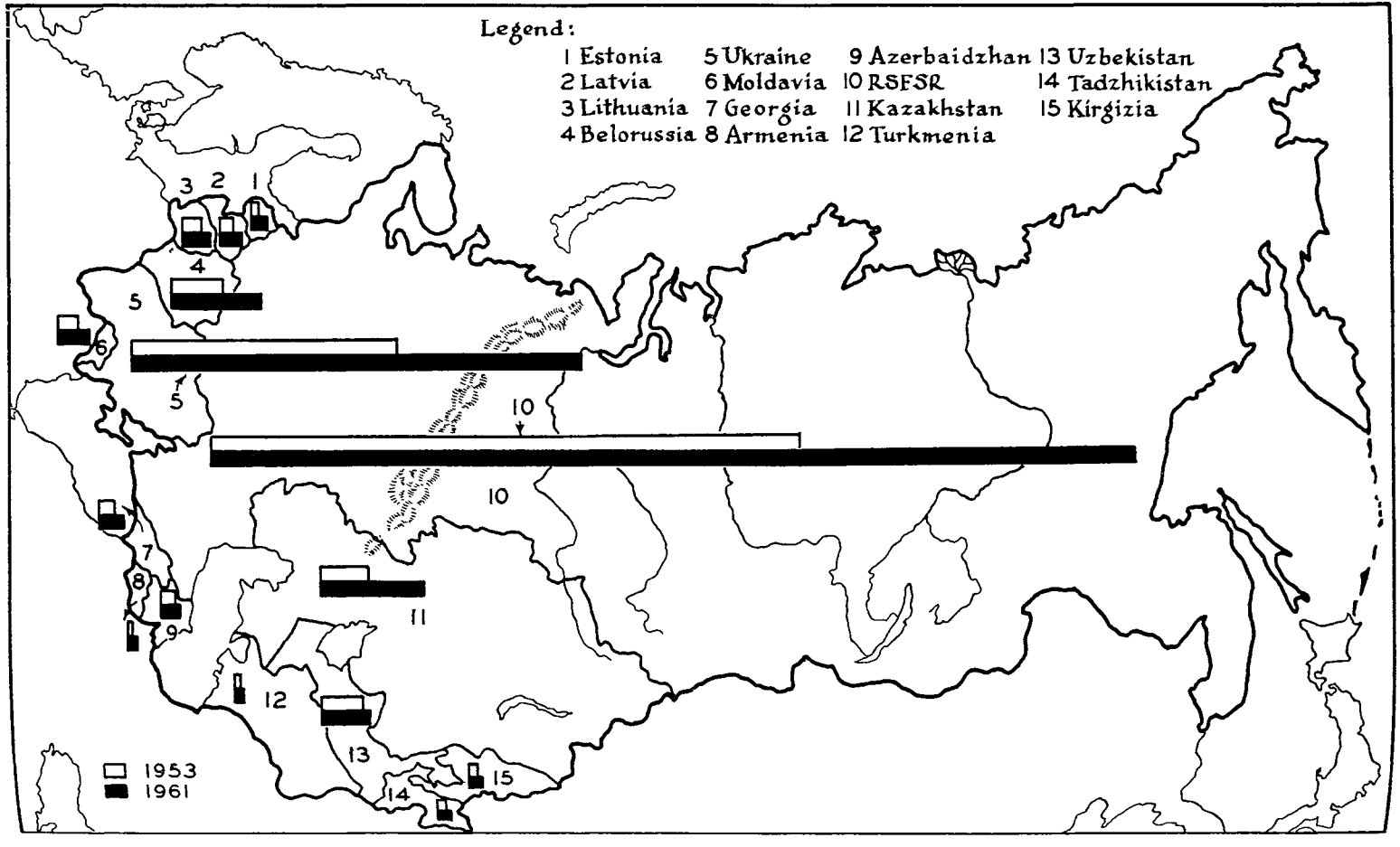
In spite of these and similar costs, the New Lands program could also be called a success, in that it provided the government with greater freedom to maneuver in the old farm areas, especially in relation to the various livestock production programs, to be discussed shortly. The new grain supplies made it possible to reduce procurement quotas in parts of the old territory (especially in the period 1958-1960) and to re-allocate some of the acreage formerly devoted to grain, feed, and technical crops. From 1953 to 1959-61 (average), total area under the latter rose by 13.6 per cent, while that under sugar beet rose by almost 90 per cent. Simultaneously, the acreage under feed crops registered a very pronounced increase of 87.5 per cent (32, pp. 331-32, 337). The impact of these changes on some selected regions of the USSR is illustrated in Table 10. Shifts in the value of gross agricultural output (measured in constant prices) for the various republics are shown in the map below and in Table 13. In a very real sense, the New Lands venture may be said to have made the corn program possible.

While it is difficult to evaluate the extent to which the performance of the New Lands justified the expectations of Soviet leadership, the presumption must be that they ultimately failed to do so and by a substantial margin. In his recently published memorandum on "Ways to Solve the Grain Problems," addressed on January 22, 1954, to the Presidium of the Central Committee of CPSU, Krushchev indicated that there was every reason to expect average grain yields of some 14-15 quintals per hectare. But he also mentioned a lower figure of 10 quintals, and it may well be that he was somewhat carried away by his missionary zeal in an attempt to convince

12. This and the preceding paragraph is based largely on the up-to-date excellent account by Durgin (7), containing a much more detailed analysis than is possible to undertake here. For a recent Soviet appraisal, see 2.

13. 26, July 15, 1962. For details of assistance offered to new settlers see *ibid.*, September 2, 1954 and August 9, 1962.

VALUE OF GROSS AGRICULTURAL OUTPUT IN 1958 PRICES, USSR, 1953 AND 1961



some of the more skeptical colleagues. At any rate, only the lower figure was cited in his discussion of the program a year later (*20*, v. 1, pp. 89-91, 431). As a matter of fact, however, yields in Kazakhstan reached a high point of 10.4 quintals only in the bumper crop year of 1956; since 1958, trends in Kazakh grain yields have consistently been downward, falling to a low of 6.6 quintals per hectare in 1961 (*33*, p. 214; *32*, pp. 346-47).

The impact of these trends would obviously affect the value of the gains in time, which constituted the other benefits that the government expected to derive from the New Lands program. The analysis of this aspect, however, is best delayed until we have examined some of the major changes effected in the field of farm policy and organization on the all-Union level. To these problems we now turn.

III

Measures introduced in the period 1953-57 fall conveniently into three distinct although not unrelated categories: (1) those acting directly on peasant incentives, (2) those designed to strengthen collective farm economy, and (3) those aiming at a shift in the production pattern, giving greater emphasis to the output of animal products.

One of the very first measures focused directly on the pocketbook of the farmer: On August 6, 1953, major alterations were introduced in the structure of the agricultural tax, which had served as the equivalent of income taxes imposed upon other groups of the Soviet population. The basis upon which the tax was calculated was shifted from the estimate of "assumed normal income" of the collective farmer from his household plot, to that of a straight land tax, with rates varying broadly between the individual farming areas. This reform, which also included an elimination of progressive rates, produced an immediate and substantial impact. In 1952, total revenue from the agricultural tax amounted to nearly 10 billion (old) rubles (or almost five-sixths of money income received by collective farmers from the collective farms, and possibly as much as 12 per cent of total money incomes of the farm population). Within the next two years the proceeds of this tax declined by 58 per cent; they have since fluctuated narrowly around a level of 4.2 billion (old) rubles (*39*, pp. 231-32). Its relation to the total money incomes of collective farmers received from collective farms, or in the total of such incomes earned by the farm population, declined by a considerably greater relative amount, as money incomes of the farm population rose substantially during this period.

An additional measure affecting the peasant directly was passed some six weeks later, following the deliberations of the September 1953 plenum meeting of the Central Committee (which constituted the first open, though still incomplete, airing of problems of Soviet agriculture). Since the early thirties, the small household plot of the collective farmer was subjected to a tax in kind in the form of compulsory delivery obligations for all major farm products, paid for at very low—by 1953, virtually nom-

inal—prices. Failure to meet these quotas exposed the peasant to outright confiscation of the products and/or to very high monetary fines. The so-called "September decrees" dealing with various aspects of agricultural problems included very substantial reductions in compulsory delivery quotas. In the Ukraine, for example, the household's liability to deliver meat was cut by 25 per cent, quotas for forced sales of other animal products were reduced by amounts ranging from one-third to one-half, and an unknown reduction in the size of the potato quota was also introduced (*38*, p. 107). Towards the end of this period, N. S. Krushchev, when addressing a meeting of agricultural workers in Leningrad, on May 22, 1957, proposed the total elimination of delivery quotas from household plots. This was later enacted with effect from January 1, 1958, and, according to some Soviet calculations, resulted in an annual increase in the disposable income in kind of the average household of some 27 kilograms of meat, 77 kilograms of milk, 70 kilograms of potatoes and 42 eggs.[14]

All these reforms were aimed directly at the individual farmer, but he was also to benefit from many measures designed to strengthen the financial position of the collective farm. As already noted, this had been allowed to deteriorate under the impact of discriminatory price and procurement policies. Like the household plot, the farm was subject to compulsory deliveries of many products; in theory it could also sell additional amounts to the government at much more attractive prices, but these so-called "state purchases" were not carried on during the postwar period before 1952-53 (with the single exception of milk). In addition, the farm had to deliver substantial amounts of grain and other crops as payment in kind for services provided by state owned Machine Tractor Stations, and a sizable increase in the volume of these payments occurred in the period 1940-52. Some indication of the burdens imposed on farms by this elaborate procurement system can be obtained from the fact that compulsory delivery prices for some products (meat and potatotes) had remained unchanged since 1933, while those for grain had not been raised since 1935, even though the retail prices of consumer goods in 1952 were 9.6 times as high as they had been in 1932 and 4.8 times those effective in 1935.[15] At the end of 1953, the farms were in debt to the government to the amount of almost 25 million tons of grain—debts which were collectible over and above the amount of currently imposed obligations (*20*, v. 1, p. 98). Under those circumstances, the average farm was clearly unable to offer its members sufficient inducement to supply effort in the socialized sector.

The government attacked the problem by initiating increases in farm

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14. *20*, vol. 2, p. 458. The volume of 1957 deliveries per household is calculated from absolute totals given in *11*, p. 38, and data on the number of collective farm households in 1957 (*33*, p. 52). It would appear that the bulk of the increase in rural per capita consumption of foods, as calculated by Kerblay in *18*, p. 894 for 1953-1958, can be attributed to the effect of this measure.

15. See *17*, pp. 38-39, and various detailed data in appendices E and H. Trends in state retail prices are taken from *10*, pp. 168-69.

prices as well as drastic changes in the structure of its own procurement. Its first attention was devoted to *purchase* (as opposed to delivery) prices of grains, which were increased by roughly 900 per cent on June 19, 1953. Three months later, delivery prices of potatoes and vegetables, as well as delivery and purchase prices of major animal products were also raised (*34* and *26*, September 26, 29, 1953). Simultaneously, the share of purchases in the total volume of state procurement rose within a year to approximately 20 per cent for grains and eggs, about 30 per cent for milk, meat, and potatoes, and slightly over 40 per cent for vegetables (*34*).[16] Under the combined impact of these measures, the index of government procurement prices rose by 107 per cent between 1952 and 1954 (*33*, p. 117).

Further changes in the level and structure of the various farm prices occurred in 1955 and 1956. This time, however, the government appears to have been concerned not only with the rise in the farm prices of major food staples, but also with income distribution in the countryside. As many observers have noted, the "Stalinist" price system in agriculture resulted in a substantial differentiation between, and inequalities in, the incomes of individual collective farms. This was partially due to the fact that prices of technical crops were generally set at a high level in relation to those for less glamorous products. (In 1952, for example, government expenditures on procurement of cotton alone amounted to 36.8 per cent of the total government procurement bill for the collective farm and private sector. If flax and sugar beets are added, the percentage rises to 48.7). Additional inequalities arose to some extent as a result of locational factors (proximity to urban centers, etc.), but fundamentally because of the fact that farms were allowed to retain a substantial proportion of rent, in spite of official theoretical strictures.[17] This sort of situation resulted directly from the operation of the dual price system, as farms located on better land were able to sell relatively large amounts at the high purchase prices. The government's price policy during this period was aimed broadly at the reduction of the spread between delivery and purchase prices, attenuating somewhat income inequalities in the countryside. (Under the impact of all price and procurement measures enacted since 1952, the share of cotton in the total value of government procurement from the collective farm and private sector declined to 13 per cent in 1957, while the over-all price index in all government procurements in the latter year stood at a level of 266 in relation to 1952 taken as 100. Cf. *33*, pp. 117-18.)

16. According to *34*, the share of state purchases in total procurements in 1952 was 6.5 per cent for milk and 6.8 per cent for meat (1952 was the first postwar year during which meat purchases took place). There were no purchases, as opposed to deliveries, of other products until 1953.

17. Official theory teaches that rents due to locational factors or better natural conditions (the so-called "differential rent I") should be appropriated by the state, while those arising from greater productive efficiency or due to land improvements (differential rent II) may be retained by the farms.

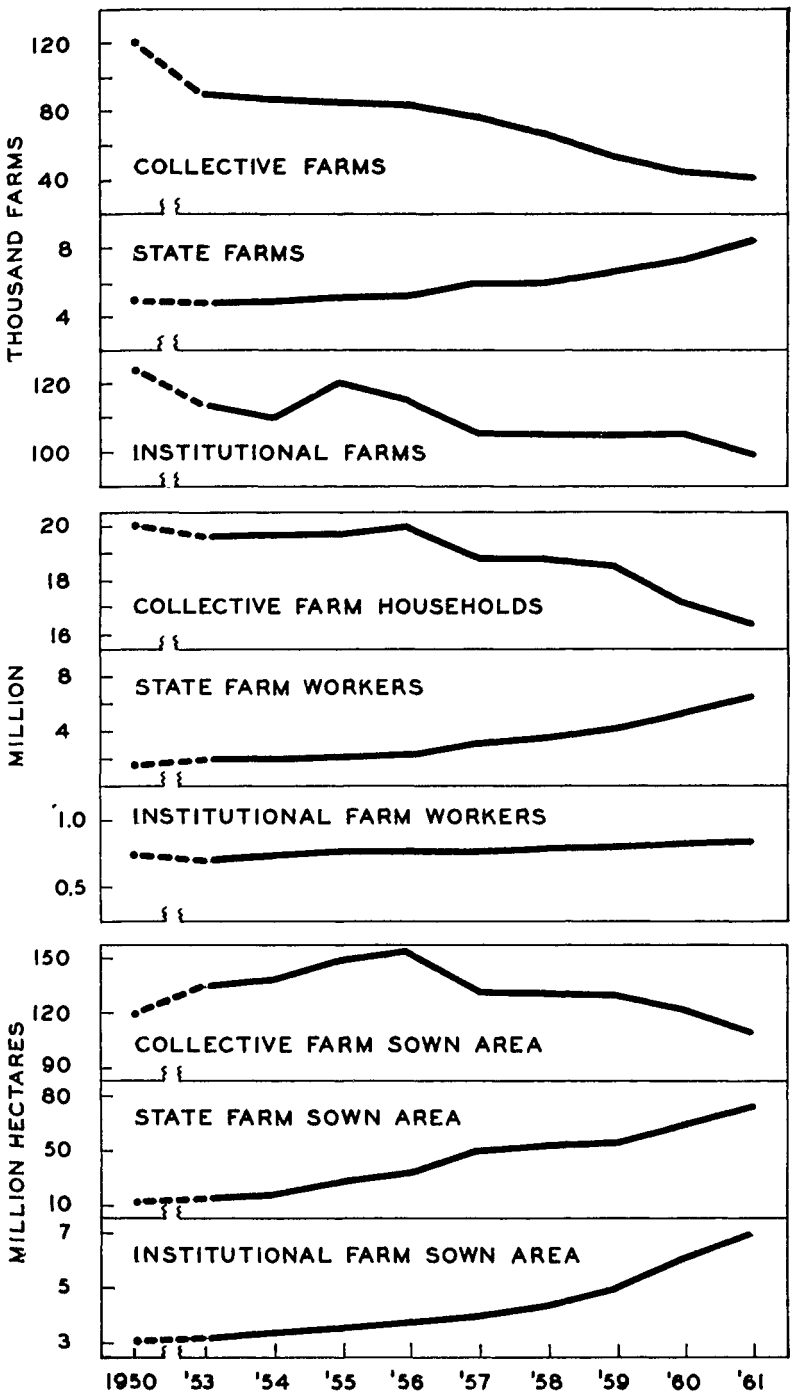
A further attenuation of income inequalities was achieved in this, as well as in the later, period by the continuing policy of mergers between collective farms, and also through outright conversions of collective into state farms. As is made clear by the experience of Krushchev's own native relatively strong collectives. Conversion of weak and run-down collective village of Kalinovka, many of the mergers involved absorption of weak by farms into state farms (many of which occurred in 1956 and 1957) had a similar effect, since even in 1959 the ratio of labor remuneration on state farms to that on collective farms was equal to 1.75:1 (37, p. 155). Under the combined impact of both policies, the number of collective farms declined from 91.2 thousand in 1953, to 76.5 thousand in 1957. By 1961, the number of farms was only 40.5 thousand, while the number of households declined by 3.3 million since 1953 (32, p. 418).

We do not wish to imply that factors discussed in the preceding paragraph constituted the entire rationale of the conversion program, which has been based on many other economic as well as ideological considerations. As shown in Chart 1, conversions of collectives into state farms proceeded slowly in 1954-56. The program was accelerated in 1956-57, partly as a result of the inherent deficiency of the collective farm as an instrument of settlement of the New Lands, and partly in order to alleviate some of the manpower problems of weak collective farms located in the northwestern and western regions of the USSR. After a brief deceleration in 1958, the rate of conversions increased again in 1959-60, in connection with the government's desire to create solid belts of specialized suburban farms in order to supply the major cities with potatoes, vegetables, fruit, dairy products and meat. So far, only limited successes have been achieved in connection with the latter program.[18] It is also possible that some conversions occurred on the initiative of local authorities, who, as a result, found it possible to acquire additional budgetary appropriations and to eliminate some of their inefficient "problem" collectives.

The government also sought to make work in the socialist sector more attractive by facilitating the introduction of more regular labor payments. Previously most of the remuneration was handed to collective farm members at the end of the year, with the result that the farmer was forced to depend upon savings or sales on the collective farm market to meet his current expenses. On March 6, 1956, the government recommended an extensive use of advance monthly money payments against the final distribution of labor remuneration, and arrangements were made for advance payment to farms of up to one-half of total value of compulsory deliveries of several major products (6, pp. 603-05). By 1958, 95.3 per cent of all farms had adopted a more or less comprehensive variation of this scheme (36, p. 26). Simultaneously, the government also recommended a wider use of supplementary (bonus-like) premiums, the magnitude of which was to

18. For an extensive Soviet discussion of shortcomings of specialized suburban farms see a series of articles in 8, October 13, and November 17, 1962.

CHART 1.—TRENDS IN FARM ORGANIZATION, USSR, SELECTED YEARS



Source: Table 14

vary depending upon the productivity of collective farmers working individually (as, e.g., milkmaids) or collectively (as members of field brigades).

Finally, the state has also shown increased concern with the efficiency of collective farm output. In the first place greater flexibility was introduced into the agricultural planning procedures in March 1955. Under the system in effect until then, detailed output plans, specifying acreages under the various crops, the sequence of rotations, the type and number of animals to be raised, were formulated by local government agencies on the basis of plans set for the higher administrative units. Procedures of this sort converted collective farm managers into obedient recipients of orders, limited severely the scope for local initiative by requiring official approval of any and all changes in the product mix, inhibited specialization and often forced the farms to carry out production on a small and obviously uneconomic scale. The new "rules of the game," promulgated by the March 9, 1955 decree on farm planning, provided only for the continued issuance of a detailed procurement (as opposed to production) plan for each farm. Subject to the fulfillment of these goals, the farm was in theory free to plan its own output (*26*, March 11, 1955.)[19]

Secondly, the state began to show interest in collective farm production costs, an accounting category which was virtually unheard of under Stalin. The difficulties involved in computing these costs were considerable, centering chiefly on the question of the proper valuation of payments in kind of MTS services and also that of the reward for the factor labor. An extensive discussion of the appropriateness of various proposed procedures took place in 1955-57, and a first detailed study of collective farm production costs was released in 1956. Some groundwork was thus undertaken for the eventual adoption in the collective farm sector of a degree of accounting methods.[20]

The shift to a production policy favoring the output of animal products began in September 1953, when a substantial increase in goals for the 1954 livestock herds was promulgated. In January 1955, a major livestock production program was introduced, with the goal of raising the output of major animal products by 1960 by about 100 per cent above the levels achieved in 1954. Such very high goals for the output of meat, milk, and eggs were to be achieved on the basis of a projected rapid increase in total grain output, which was to expand to 160 million tons by 1960, from a level of 86.6 million tons, achieved on the average in 1952-54. A major part in this program was to be played by corn, a crop which until then had been rather insignificant in the mix of Soviet grains. Noting the role it plays in American feed supplies, Khrushchev dubbed it a double weapon, which would at one and the same time allow for increased grains supplies, while

19. As will be noted later (p. 140) the actual situation was rather different.

20. This subject is explored in much greater detail by Nancy Nimitz in *14*, pp. 239-73.

also providing the farms with larger quantities of succulent feed. The scale at which expansion was planned can truly be called colossal, since by 1960 acreages under corn were to expand by almost 7 times, or to 70 million acres (*26*, February 2, 1955). The new campaign envisaged the planting of corn in areas where it had never been grown before; some of these lay considerably to the north of what might be considered the geographical limit of growing corn for grain, and it was primarily this feature which gave rise to many skeptical comments by Western commentators.

There can be no question that the corn program, implemented rather abruptly in a typical Soviet campaign fashion and often without proper regard for local conditions, must have resulted in considerable waste that might have been avoided by a more gradual and carefully planned shift to corn or other sources of feed, such as sorghum. Against these inefficiencies, which are not easy to quantify, we must set some very real gains achieved in the volume and quality of total feed supply. According to D. Gale Johnson and Arcadius Kahan, the corn program had little if any impact on the total grain supplies, but the increase in feed supplies from acreages affected by the shift has been calculated at approximately two quintals per hectare, or about 17 per cent. The use of corn for feed often leaves much to be desired from the agronomical standpoint, as about three fifths of total corn silage has been prepared from corn with undeveloped cobs. But it seems reasonable to say that a substantial and significant improvement in the composition of Soviet feed rations occurred as a result of greater availability of green feed and silage.[21]

The impact of all these measures on the total volume of Soviet farm output in the period ending in 1957 was considerable. Measured in terms of three year averages, gross farm output in 1957 (as measured by the official index) exceeded that realized in the last three years of Stalin's rule by 48.7 per cent (cf. Table 1), and gratifying performance was also achieved in the animal sector (cf. Tables 4 and 5). These results were in part due to a 28.8 per cent increase in total sown area, to a rise of productive investment in agriculture by 116 per cent, to a near doubling of the production of mineral fertilizers and a substantial increase in the machinery park. (Rough calculations indicate that in spite of the drain of New Lands on the supply of new machinery, the ratio of sown area to available tractors or combines in the old farm areas may also have improved.) Collective farm incomes nearly tripled, and this led to a considerable improvement of the economic position of the average peasant. Whereas farms distributed only 12.4 billion (old) rubles in the form of labor day re-

21. D. Gale Johnson in *5*, pp. 228-30. Analysis of corn acreage data in *32*, pp. 328-29, shows that as late as 1959-60 the proportion of corn planted for green feed or used for silo prepared from undeveloped cobs, in the best corn areas of the Ukraine and Northern Caucasus exceeded 40 per cent. It declined very considerably in 1961 (to 9-13 per cent in parts of the Ukraine and 25 per cent in the Caucasus.) It is too early to tell whether we have to deal here with processes usually described by the learning curve. In any event, however, green feed was, or is available where none might have been had before.

muneration in 1952, 47.8 billion rubles were paid out in this fashion in 1957. Total distributions in cash and kind were said to have risen by 76.4 per cent during the same period. For the years 1953-57, Khrushchev reported a rise of 33 per cent in total real income of collective farmers, measured per working individual and including income earned in the private sector (26, January 25 and December 16, 1958).[22]

All this does not mean that farm policy in the period 1953-1957 was free from all elements of inconsistency or that such inconsistencies as did occur were entirely harmless. For instance, the handling of farm production planning by the March 9, 1955 decree may well be described as treatment of the symptoms rather than the causes of the disease. Clearly, the extent to which the hands of the farm managers became effectively untied depended very largely upon the size of the procurement quotas and the latitude of choice which they afforded to the farm. Under certain circumstances, the constraints imposed by these quotas could continue to be as effective as those imposed earlier by the outright production targets. But the earlier methods of setting uniform procurement quotas per unit of collective farm land had not been revised following the 1955 reforms. At least one careful observer noted that this had resulted in a considerable reduction of the otherwise beneficial impact of rising farm prices and incomes; in many instances farms were forced to produce certain outputs at a ridiculously small scale and suffered substantial losses in consequence (*1*, p. 56, 64-65; and *34*). It should also be kept in mind that violation of the provisions of the March 1955 decree were apparently quite common, and that the establishment of production rather than procurement targets by administrative agencies at various levels continued to occur frequently (*25*, p. 52).[23] This was undoubtedly due to the continued emphasis placed on the high procurement goals, as well as to the fact that the performance of target setting officials was largely evaluated on the basis of procurement results.

There is also some evidence to suggest that the impact of various measures designed to reduce income inequalities between farms may have been offset to a considerable extent by increasing income inequalities within farms, due in part to the effect of productivity bonuses. Given the continued practice of rewarding labor out of residual shares, the introduction of such premiums meant a necessary reduction in the basic labor reward of other workers. This often led to situations where, for example, income of milkmaids might exceed that of farmers employed in crop production on

22. For a more complete evaluation of the complex and not easily measurable trends in peasant incomes see *24*.

23. Problems arising in this context are well illustrated by a comment of a collective farm chairman from the Kostroma *oblast'*, published in *8*, January 5, 1963, under the heading "We Can Get By Without Guardians": "Since 1953 . . . our money income increased seven times. We could work even better, if we were not subject to 'planning.'" "Planning" here is to be understood as imposition of targets and goals from above, which is unwarranted from the vantage point of farm management.

the very same farm by no less than 600-900 per cent, and the consequent distortion of the structure of incentives within the farm tended to offset the impact of other measures designed to draw the farmer into the socialized sector (*34*). In any event, substantial inequalities in incomes *between* collective farms are still prevalent today;[24] some idea of regional differences may be gained from data presented in Table 12.

Finally, the government had also seen fit to introduce legislation aiming at a limitation of the private household plot and a concomitant reduction in importance of the private sector. This took the form of first raising the minimum labor inputs required in the socialist sector in 1954 (cf. *21*, No. 15, 1954, p. 66) and in 1956 of enabling the collective farm management (subject to the approval of the general meeting of the farmers—which is not too difficult to secure for an experienced Soviet administrator) to reduce the size of the household plot and the number of animals kept thereon below the limits envisaged in the Collective Farm Charter of 1935 (*6*, pp. 605-11). The groundwork was thus laid for a reduction in the average size of the plot and of the number of animals held on an average plot. While measures of this sort were consistent with the policy of placing greater emphasis on the socialized sector, they did not fit well with those designed to raise the over-all volume of farm output and the disposable income of the collective farmers.

One should also note that policy measures introduced through 1957 left untouched the basic weaknesses of the collective farm organization, which impeded the achievement of greater efficiency. Thus, tractors and farm machinery remained concentrated in Machine Tractor Stations with the result that decision making with regard to the conduct of basic farm operations was still divided between the management of the farm and that of the MTS. In an environment where major success indicators for MTS performance were largely divorced from the trend in the volume of output to which the machines contributed, this could only have detrimental effects on the efficiency of production. As already implied, the divorce between the command over large volume of machinery and that over other factors of production continued to inhibit the calculation of collective farm production cost at the farm level. (Such computations would still have to face the difficult problem of valuation of labor inputs.) And the existing system of government farm prices still resulted in a peculiar relationship between prices, the size of the harvest, and production costs, inasmuch as average realized prices tended to vary directly with the size of the harvest and inversely with production costs.

Thus, although the period 1953-57 saw the introduction of many improvements of potentially lasting value, it is possible to discern a perilous

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24. According to V. Starovskii, director of the Central Statistical Administration, labor payments per man-day on 30 per cent of collective farms in 1961 were equal to only 20-25 per cent of payments made by the highest fifth of the farms, arrayed by size of incomes. Cf. *21*, No. 13, 1962, p. 46.

tendency towards inconsistency in the aims or the effects of various policy measures. Progress in the direction of implementing major structural changes which might have raised the efficiency of factor utilization in agriculture was limited. Conceivably, this might have been due to internal tensions within the Party leadership, where the so-called "Anti-party group" appeared to have enjoyed a kind of veto power.

IV

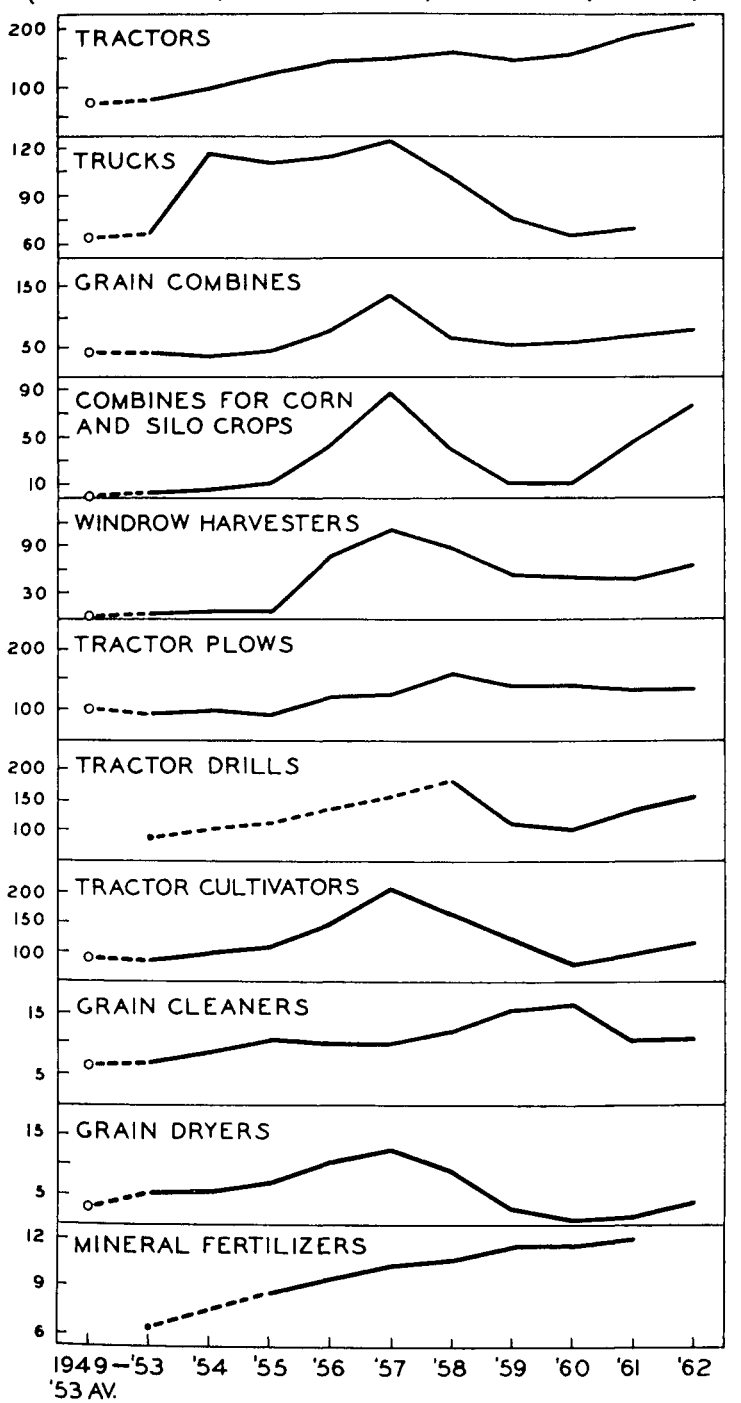
Whether or not this was the primary cause of the delay in introducing such changes, the government appeared to compensate for it by a series of reforms introduced in 1958. During the spring of that year, Machine Tractor Stations were abolished, and their machinery was purchased by collective farms. Dual pricing of farm products gave way to a single price system. Prices of crops, which on the average allowed for a substantial profit, were henceforth to be set on a flexible basis, varying directly with costs and inversely with the harvest. Shortly thereafter, collective farms were pressured to introduce regular wage-like remuneration of labor, and by 1961 almost one-fifth of their total number responded to such "suggestions" *(34)*. Thus, giant strides appeared to be being taken towards the conversion of collectives into potentially more efficient enterprises that might be able in the future to effect substantial reductions in their production costs.

There is ample evidence to the effect that during the period immediately following the introduction of these reforms, expectations of future gains in farm productivity ran high in top official circles. It is now clear, however, that the relatively high priority accorded to agriculture before 1958 was not maintained thereafter. The share of agricultural investment in total investment in the national economy (excluding investment by individuals in housing) declined without interruption from 17.6 per cent in 1957 to 15.3 per cent in 1960 (*19*, p. 50). The state had actually seen fit to cut the real volume of its productive investment outlays in farming during 1958 and 1959. The rate of growth of total productive investment in agriculture (including that made by collective farms) which stood at a very healthy 12.8 per cent in 1958, declined to 7 per cent in 1959 and to 2.4 per cent in 1960 (*30*, p. 155). In a seemingly naive complaint, uttered in March 1962, Khrushchev declared that "in 1957, when more attention was paid to the production of farm machinery", the output of several major categories was actually greater than in 1961 (*26*, March 6, 1962; see also Chart 2). The rate of growth of output of mineral fertilizers (a deficit commodity by any definition) declined from 7.7 per cent in 1957 to 5.5 per cent in 1958 and 4.0 per cent in 1959 (cf. Table 11).[25] Even

25. The Seven Year plan called for an output of 35 million tons (cf. Table 11). A recent Soviet estimate of fertilizer "requirements" is 132 million tons. The planned application of fertilizer in 1963 is but 16 million tons, out of which 7 million tons are allotted to technical crops (*21*, No. 4, 1963, p. 58).

CHART 2.—ALLOCATION OF MAJOR OFF FARM INPUTS TO AGRICULTURE, USSR, SELECTED YEARS

(Thousand units, or million tons of commercial fertilizer)



Source: Table 15

though it rose to 7.4 per cent in 1960, the situation during the first two years of the Seven Year Plan was completely unsatisfactory; instead of the required annual increase of 3.2 million tons, the actual growth proceeded at the rate of 724 thousand tons per annum. Substantial delays occurred in the construction of new fertilizer capacity. "Time passes," lamented Khrushchev, "and there are no weed-killers." Finally, as Joseph Willett has noted, the share of agriculture in the allocation of new tractors and trucks was also reduced (*15*, p. 107).

In mid-1958, substantial increases took place in the prices of new farm machinery bought by the collective farms, and one source speaks of the doubling of prices of gasoline and spare parts (*34*).[26] The 1958 reform of farm prices was based on the general principle of maintaining over-all government outlays for the purchase of farm products (including those for the operation of Machine Tractor Stations) at the level of 1958. Future rises in farm prices were officially ruled out at this juncture, even though the new prices of animal products failed to cover production costs by a considerable margin.[27] In general procurement targets continue to be set at relatively high levels (especially in the livestock sector), thus preventing the collective farms from augmenting their revenues through sales on the collective farm market.

Yet, money expenditures of collective farms increased substantially for reasons other than the increase in the prices of some off-farm inputs. There was first the matter of meeting installment payments for the purchase of machinery from the Machine Tractor Stations, as well as for the equipment of many milk collection points which were also sold to collective farms at about this time (*35*, pp. 47-48). Although considerable, such outlays could be expected to terminate at some future date. The situation was different, however, with regard to the necessity to maintain the earlier level of income, and additional "fringe benefits," of equipment operators and other personnel transferred to the collectives from the MTS. For farms which had adopted wage-like labor rewards, there was also the necessity to meet the monthly payroll. Scattered evidence suggests that all these strains resulted in a very considerable increase in collective farm indebtedness to the State Bank: in the Tatar republic, this increased by 44 per cent during 1958 and by an additional 50 per cent between 1958 and 1959. In Novosibirsk *oblast'* the volume of farm debt in 1960 was 2.6 times as high as it had been in 1957 (*34*).

Through 1960, financial difficulties of collective farms were further aggravated by nominally illegal pressures from overzealous local officials for

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26. The increase in prices of the few items for which data are available ranged from 5.6 to 69.5 per cent. Most quotations, however, show a rise of between 25 and 30 per cent.

27. See *26*, June 21, and December 16, 1958. In 1960, purchase prices for cattle covered only 64.5 per cent of production costs, while the corresponding figure for hogs was 67.1 per cent. Since costs are assumed to have declined since 1958 and prices did not change, the situation in that year was even worse (*26*, June 1, 1962).

fulfillment or overfulfillment of high procurement targets. Thus, losses were suffered in attempts to exceed, e.g., milk product delivery quotas with butter purchased from retail stores at higher than farm purchase prices, or by acquisition of livestock from the private sector, presumably also at inflated market prices (*26*, January 21, 1961).

Since the collective farm still rewards its labor out of residue product, the response of farms to all these strains was a predictable decline in the amount of remuneration of the labor input of collective farmers. Data published in 1961 with respect to a small, but possibly not an unrepresentative, sample of 540 households (including many located on model farms) revealed a decline of 8.3 per cent between 1957 and 1958 in collective farmer incomes from private and socialized sectors, measured on a "per able-bodied farmer" basis. (The decline in income from socialized sector alone was equal to 4.6 per cent: *22*, p. 77.) For 1957-60, data made available in the summer of 1962 for a number of republics suggest a reduction in total incomes per man-day from the socialized sector ranging from 11 per cent (Belorussia) to 29 per cent (Moldavia).[28] Simultaneously, the implementation of measures directed against the household plot began to affect peasant incomes derived from the private sector. Between 1957 and 1960 the size of the household plot on the collective farm was reduced by about 9 per cent, while cattle-holding on an average plot declined by about 19 per cent. Holding of cows and hogs also dropped below their post-Stalin peaks, achieved in 1958 and 1956 respectively.[29] Total volume of collective farm market sales, which amounted to 48.4 billion rubles in 1958, was only 46.2 billion in 1959 and 43.3 billion in 1960. The presumption must be, therefore, that the private sector was unable to compensate the collective farmer for the loss of income (whether in money or in kind) received from the socialist sector.

Farms also found themselves unable to maintain the high volume of productivity bonuses paid in the earlier period. This was particularly true of those farms which had abandoned the use of the labor day in favor of a fixed wage, but it also applied to others. There are indications that the abandonment of productivity premiums (which went counter to the unchanged official policy) was in many instances sanctioned by local officials,

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28. Among other republics affected by declines in incomes so measured were Ukraine (18 per cent), Uzbekistan (17 per cent), Georgia (14 per cent) (*19*, p. 50). According to 8, April 9, 1962, p. 8, distributions per labor day during the same period declined by 15 per cent in the Rostov *oblast'* of the RSFSR and "essentially the same situation was observed in many collectives of the Tambov *oblast'* (RSFSR), in the Estonian and Latvian republics and in a number of other parts of the country." On the basis of this evidence it is hard to avoid the conclusion that the decline in farmer incomes was a general phenomenon. On the question of incentives generally, see the paper by Alec Nove in Roy D. Laird, ed. *Soviet Agricultural and Peasant Affairs* (Lawrence, Kansas, 1963), pp. 51-68.

29. Calculated from data in *33*, pp. 266-9, and *32*, pp. 382-3, as well as official data on the number of collective farm households.

better able to recognize the plight of the farms.[30]

The combined impact of all these trends on the volume of farm output during the period beginning with 1958 was clearly disappointing. Initially, and largely under the impact of extremely favorable weather in 1958, the official index of gross farm output rose by 11 per cent. But output increased by only 0.6 per cent in 1959, and then rose by only 1.9 per cent in 1960 (and by 3.1 per cent in 1961: cf. Table 1). While this exceeded the overall rate of growth of Soviet population, it fell short of matching the rate of growth of urban population, and was of course substantially below the nearly 8 per cent compound rate of increase implied by the targets of the Seven Year Plan (1959-1965). At the end of 1960, it appeared that an increase of 66 per cent in the volume of gross output would have to be achieved within the next five years. These trends were also accompanied by a decline or by virtual stagnation in some productivity indicators in the livestock section (Tables 1 and 7).

The government was somewhat slow to recognise the full detrimental impact of its neglect of collective farm finances and the burdens imposed by its policies on the individual farmer. Remedial measures that followed the January 1961 plenum meeting of the Central Committee were addressed chiefly to the financial condition of the collective farms. Interest rates on loans made to them were cut by half or more (from 2 to 1 per cent on short term loans, and from 1.75 to 0.75 per cent on long term loans) while four-fifths of income from animal production was exempted from income taxation for the next four years. Prices charged for gasoline and spare parts were reduced as much as 40 per cent, while smaller cuts were made in prices of farm machinery. Finally, the length of time over which installment payments to pay off debts arising from the original purchase of MTS equipment could be spread was substantially increased (*20*, v. 4, pp. 252-3). The government was also able to augment its investment allocation to agriculture, with the result that even though collective farm investment remained virtually at its 1960 level, total investment in agriculture rose by 11.4 per cent in the course of 1961 (*32*, p. 546).

Yet, the pressure of rising urban demand and of mounting export requirements also forced the government to raise still further the already high procurement goals "for the very near future."[31] In order to eliminate certain inefficiences in the procurement sector, accentuated by the abolition of direct state control agencies in 1956, the government re-established these in the form of procurement inspectorates, which were also charged with the control over productive activities of all Soviet farms. Developments in 1961, however, failed to bring any substantial improvements in the rate of growth of

30. As stated in one of the sources described as *34*, the Moscow and the Perm *oblast'* administrations of agriculture encouraged the abandonment of productivity bonuses in their official publications. Similar instances also occurred elsewhere.

31. *26*, January 19, 1961. These goals exceed those of the Seven Year Plan by approximately 20 per cent.

farm output as a whole. The procurement plan for the major farm products was not fullfilled and the inspectorates were clearly unable to achieve substantial increases in the level of farm productivity. The lagging rate of overall improvement in agriculture was made even more intolerable by the pronouncement of agricultural goals of the Party Program. According to these, the gross agricultural output was to reach a level exceeding that of 1960 by not less than 150 per cent in 1970 and by 250 per cent in 1980 (*26*, October 19, 1961).

The response of the government to these pressures took a variety of forms. First of all, a drastic reorganization of agricultural administration took place in the spring of 1962, following the deliberations of yet another plenary session of the Central Committee devoted to farm problems. The Ministry of Agriculture was stripped of its remaining executive powers over farms. The functions of supervision, leadership, and control were entrusted to newly formed territorial production administrations, uniting under their jurisdiction both state and collective farms (*26*, March 11; *27*, March 25, 1962). This reform might reasonably be expected to reduce considerably the amount of interference on the part of general adminstrative agencies, and there is little doubt that in this regard it will prove beneficial. Yet it also strengthens centralized controls over the daily productive activities of the farm (inspector-organizers being now assigned to a fixed number of farms on a permanent basis), so reversing the slight trend toward decentralization in minor decision-making which developed after 1955 in spite of the obstacles discussed earlier.

Simultaneously, another measure, reminiscent of the New Lands program in that its beneficial effects will be more pronounced in the short run, was also introduced in 1962. Following a protracted grass-roots campaign directed by Khrushchev against the Williams rotations (which assigned a very significant role to perennial grasses) a decision was taken in March to convert about two-thirds of the total acreage under perennial and annual grasses, oats, and clean fallow to higher yielding feed crops such as peas, sugar beet (grown for feed), corn, and others. All of these crops are labor intensive, and the machinery requirements of the venture are likely to be rather high. Moreover, perennial grasses conserved much of the needed nitrogen in the soil, and the loss of nutrients resulting from the shift of acreage to other crops (which to be sure will be considerable only in the longer run) will eventually call for greater application of mineral fertilizers. With respect to factor supplies, the campaign to reduce acreages under low yielding feed crops will thus be competitive with other programs designed to raise productivity in agriculture. The decisions to raise investment allocations to agriculture and to expand the chemical industry taken in the November 1962 plenum meeting of the Central Committee and made public in the annual budget message must therefore be considered in this light.

Finally, the problem of incentives was also tackled. Greater stress again is to be put on the so-called productivity bonuses, but the really important

decision in this respect was one taken three months after the March Plenum. In June 1962 farm prices of livestock were raised by some 35 per cent, while cream and butter prices were increased by 5 and 10 per cent respectively. This at length brought the farm prices for livestock within a small percentage of the average level of production costs, and eliminated much of the anomaly of subsidizing livestock output through profits achieved in the crop sector. The measure not only reversed the earlier policy of maintaining stable farm prices but also another Soviet policy of long standing, namely that of not increasing retail prices of foods. (As an accompanying measure, designed to eliminate some inflationary pressures, retail prices of butter and meat products were also raised by 25 and 30 per cent; cf. *26*, June 1, 1962).

V

Since 1953, the USSR has been engaged in a major effort designed to raise the volume of its farm output, by methods which can no longer be described as capital saving and labor intensive.[32] If the requirements of the state, (i.e., urban and industrial demand, the level of exportable surpluses and of desired commodity stocks) are taken as a gauge by which successes are measured, then the results of the various programs pursued must be adjudged as disappointing. According to Khrushchev, the 1962 requirements of the state amounted to 164 million tons of grain, 85 million tons of milk and 12.9 million tons of meat. Actual achievements in what appears to have been a very good harvest year failed to satisfy the needs by not less than 10 per cent for grain, 24 per cent for milk and 27 per cent for meat.

Yet, the exclusive application of this yardstick to the performance of Soviet agriculture might result in too harsh a judgment. After all, the volume of farm output did rise by nearly 60 per cent since 1953, and this is surely a creditable performance, even though it might have been made easier by the low initial level of production. There is also no doubt that the successes of the last decade resulted in a considerable improvement in Soviet living standards (including those of the peasants) and allowed a greater latitude to the government in the field of foreign trade. It should also be kept in mind that all these gains were achieved in an environment characterized by the consistent reluctance of the government to assign top priority to agriculture at the expense of other claimants on national resources, such as industrial development or national defense. When all these features are kept in mind, the Soviet achievements in farming appear to be much more significant.

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32. In this sense, therefore, and with due qualifications resulting from the specific aspects of the Soviet environment, the experience of the USSR may be said to illustrate the problems of transition from Phase II of agricultural development (output based on labor intensive, capital saving techniques) to Phase III (with output increase resulting from capital intensive, labor-saving techniques) set out by B. F. Johnston and J. W. Mellor in *13*.

Policies are also judged by the consistency of the pursued objectives and of the various measures selected to achieve such objectives; by this criterion, the Soviet Union does not score very highly. As we have already indicated, inconsistencies and inadequacies appeared already in the earlier period 1953-57, where the largely ideological objective of limiting the private sector led to measures that might have been expected to interfere with the larger goal of raising the volume of output. During the same period, the goal of raising output of selected products (e.g., milk) led to introduction of productivity bonuses which in effect interfered with other policy objectives. Similar charges can be levied with even greater force against the application of various policy measures during the years 1958-60. Clearly, the institutional reforms of that period aimed at the ultimate introduction of greater efficiency in Soviet farming, but they were virtually negated by neglect of farmer incomes which exerted a considerable retarding influence on trends in farm output and those of productivity as well.

The episode of 1958-60 deserves a brief comment. It would be easy to ascribe the conflicting trends in general farm policy during this period to some "inherent" inefficiency in the Soviet system. The apparent failure to take adverse trends in farmer incomes (cf. pp. 145-46) into account may, however, well have been deliberate and premeditated. In spite of all the achievements since 1953, the situation concerning the size of the "marketed surplus" is still not satisfactory today and was even less satisfactory in 1957-58, when the crucial decisions affecting farm policy for the immediate future were being made.[33] Experience gained since 1953 indicated that another round of increases in peasant real incomes might do much to alleviate the difficulties. Yet, this would have meant at least a temporary deterioration in the relative standing of urban *versus* rural real wages, and this in turn might have been regarded as an undesirable impediment to an "orderly" rate of transfer of labor from agriculture and into other occupations. As so often in Soviet history, the party and government leadership found itself on the horns of a familiar dilemma with the "Bukharin issue" reasserting itself again in a slightly different guise.

In retrospect, the leadership's decision to place the burden of adjustment once more upon the shoulders of the peasantry can be attributed to a variety of causes. The demographic factors associated with the transfer of labor clearly played a role, since as a result of wartime population losses the

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33. Between 1957 and 1961, the index of market output of agriculture shows a rise of 24 per cent (calculated from official index in 32, p. 296, 1953–100), which clearly outstrips the increase in Soviet population during the same period. An interesting plea was made by Khrushchev in February 1960 to delegates of satellite Communist parties with regard to Soviet grain exports: "We now have grain reserves, but they still do not correspond to our wishes . . . Thus we would like to request you to calculate our capabilities and to consider them, and not to show the insistence and stubborness with which we meet at times. Do not make demands which are burdensome for us to fulfill" (20, v. 4, p. 115).

overall manpower situation was exceedingly tight in 1958-61.[34] In these circumstances, and in spite of the existence of substantial regional pockets of relatively unproductive agricultural labor, the government's refusal to continue the policy measures of 1953-57, which substantially raised the *relative* real incomes of peasants as opposed to those of other classes of Soviet population, becomes at least understandable. Possibily too, the resulting hardships imposed on the peasantry were regarded only as a temporary phenomenon and it is quite likely that the record size of the 1958 harvest did much to strengthen this illusion. It is also conceivable that the government misjudged the speed at which productivity gains, resulting from institutional reforms, could be realized in practice. Undue optimism in this respect was unwarranted, since the retarding effect of high procurement quotas on the rate of productivity changes should have been taken into account. Both experience and theory teach that greater efficiency is most likely to occur in an environment characterized by some slack and less pressure, as the latter tends to lead to a relative neglect of costs.[35]

Whatever the reasons, the effect of the contradictory forces resulting from various policy measures acting in the years 1958-1960 must have been costly. Precious time was being wasted, and high time-preference is certainly one of the characteristics of current Soviet leadership. The time lost was initially purchased by the opening of the Virgin Lands at some substantial risk of long-run difficulties,[36] and it is possible to argue that application of more rational policies during this period might have rendered the current campaign for plowing up of grasslands unnecessary. Since the campaign is likely to be quite expensive in terms of many inputs, the failures of the period 1958-60 compounded the difficulties of an already delicate situation in agriculture. In the end, however, it proved impossible to avoid an increase in peasant real incomes which occurred in 1962 (interestingly enough, *after* the demographic constraints on the manpower situation became considerably weaker).

There is little doubt that the present organizational structure of the Soviet collective farm (as opposed to agriculture as a whole) provides a much more promising environment for future gains in efficiency than was the case a decade or so ago. This does not mean, however, that the outlook for such gains is very bright. For other and equally formidable obstacles to greater

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34. The net changes in able bodied population (males between 16 and 59, and females between 16 and 54 years) has been estimated as follows (thousand persons): 1957: + 1,639; 1958: + 234; 1959: — 609; 1960: — 448; 1961: + 672; 1962: + 1,227. Cf. *15*, p. 520.

35. This is well realized by farm managers: "The most dreadful thing for the state farm is the receipt of excessively high control figures for sale of output to the state or other excessively high indicators." V. Degtiarev, senior economist of a state farm, quoted in *8*, January 5, 1963.

36. Some of these difficulties may already be appearing. Cf. the trends in Kazakh grain yields referred to on p. 133 above. Grain procurements in New Land areas reached a peak of 36.8 million tons in 1956, by 1961 they amounted only to 23.8 million tons (or less than the 1954-61 average of 24.6 million tons). Cf. *31*, p. 443 and *32*, p. 375.

efficiency arise not only from the continuing pressure for a high and rising volume of procurements, or from recent measures centralizing party and government control over decision making on the farm, but also from the manner in which the various government policies are implemented as well as from the nature of some of these policies. The Soviet leadership has not yet been able to abandon the "campaign" approach to many farm problems, with all that this implies for the disregard of local peculiarities. This approach was used in the implementation of the corn program, in the drives to introduce fixed labor remuneration and productivity bonuses, and appears to be applied now to the shift away from grasses. Throughout, the leadership continues to use slogans of very doubtful economic validity. Thus, the currently popular motto: "Maximize output per unit of land;" which, for the most part is offered from Khrushchev downward in just this plain, unqualified and unexplained form, must surely result in a wasteful use of capital labor, and off-farm inputs, neither of which can now be presumed to be available in "unlimited supplies" to Soviet agriculture.

POSTSCRIPT

This article was completed in July 1963; its publication has been delayed by circumstances over which neither the Food Research Institute nor the authors had any control. In view of the recent momentous developments in Soviet agriculture, it appears advisable to add a summary postscript, even though none of the arguments advanced earlier appears to be significantly affected.

As it turned out, the weather—that old enemy of the Russian farmer—upset the intricate and long-precarious grain balance. A combination of early frosts, untimely thaws, a late spring, summer droughts, and unwise agronomical practices in the Virgin Lands resulted in a drastic reduction in the 1963 grain harvest. Although the 1963 Plan Fulfillment Report is silent on the actual extent of the decline, some indication of its magnitude can be gauged from trends in state procurements of grain. These declined from a level of 56.6 million tons in 1962 to 44.8 million tons in 1963, or by some 21 per cent. It is therefore conceivable that the decline in the gross output of grain might have been as much as 25 per cent. In the course of 1963, milk output dropped by 4.2 per cent, but meat production rose by 7.4 per cent, reflecting a small (2 per cent) reduction in cattle herds and a much sharper fall in the hog population, which declined by 42 per cent in the course of 1963.

Grain procurements in 1963 were only 3 per cent above their average level in 1954-58, while population increased by some 13 per cent and cattle herds by over 42 per cent. These trends clearly posed a major threat to Soviet long-range plans for the development of animal husbandry and the improvement of living standards. They also jeopardized the balance of payments of the USSR and posed similar problems for the economies of the satellite states (in 1961-62, the USSR exported annually some 7.6 million

tons of grain, almost 4 million of which reached the warehouses of other members of the socialist camp). Now gold or foreign exchange is needed for imports.

The dilemma outlined above forced a major re-appraisal of Soviet agricultural policy both for the short and the long run. The immediate response to the grain crisis was novel and unprecedented (except for a time of war), although it took the form suggested a decade ago by Joseph A. Kershaw and more recently by one of the writers. In mid-September 1963, a Soviet purchase of 6.8 million tons of wheat from Canada was announced by Canadian sources. Subsequent purchases from Australia and the United States will probably raise the total of Soviet grain purchases abroad, designed to compensate for the shortfall of the 1963 harvest, to some 11-13 million tons (or approximately the difference between the 1962 and the 1963 level of grain procurements).[37] The example of the USSR was followed by some satellite nations as well.

In September 1963, other far-reaching measures were foreshadowed by the stress placed by Khrushchev, during his trip through southern grain areas, on the need for expansion of the irrigated grain acreage and for a greater use of fertilizers in grain production. At the December 1963 plenum meeting of the Central Committee of the Communist Party, Khrushchev and other speakers acknowledged the unsatisfactory level of agricultural production and the disappointing state of affairs both in the chemical industry generally and the production of fertilizers in particular. Measures enacted in December call for an investment of over 42 billion rubles in the chemical industry by 1970; about 10.5 billion of which will be of direct benefit to agriculture. (Parenthetically, it might be added that in 1958-61, the average annual level of investment in the chemical industry was only 720 million rubles, while a comparable figure for agricultural investment was 5.2 billion rubles. Both of these figures refer to rubles of purchasing power as of July 1, 1955.) Simultaneously, various planning agencies were instructed to prepare and implement measures for the irrigation of additional grain acreage.

The Soviet leadership hopes that by 1970 all these measures will succeed in raising the grain output to 229-262 million tons, while meat output is to rise to 20-25 million tons and milk production to 115-135 million tons. It might be noted here that the 1970 goals of the 1961 Party Program were: 229 million tons of grain, 25 million tons of meat, and 135 million tons of milk.

Thus, a higher priority has been assigned to Soviet agriculture in the decision-making center of the Kremlin and a major shift of resources is taking place. This can no longer be described as a stop-gap measure (of the New Lands variety) and it certainly represents a step in the right direction. The same can be said of some other developments which are less clearly spelled out in the new legislation as well as of some less tan-

37 By February 19, 1964 reports indicated confirmed purchases of 11 million tons, including 1.8 million from the United States.

gible but possibly more significant shifts in attitudes among the top leadership. Thus, it is now recognized that marketing and processing capacity for agricultural products must be increased; funds for investment in storage space for fertilizers and development of machinery suitable for their application are apparently being provided. Moreover, the Soviet leaders now acknowledge the need to apply fertilizers to grain production primarily in areas with sufficient precipitation, as well as the desirability of de-emphasizing corn production in the dry areas of the Ukraine. "Priority," now says Khrushchev, "is to be given to [the total size of] the harvest."

The extent to which all these changes in policy will succeed in helping the Soviets to solve their agriculture problems must, however, remain conjectural. Clearly, a major milestone has been passed but stumbling-blocks remain ahead. In many instances, it was not so much the lack of off-farm inputs but their deficient quality which forced the farms in the past to shy away from their use. A revision in the structure of the prices received, as well as of the prices paid, by the Soviet farms is long overdue, and it is to be feared that several changes which took place in 1963 may well have jeopardized the prospects for a consistent reform. The problem of producer incentives is still a burning issue, as is the question of local autonomy in decision-making and planning of output at the farm level, with all that this implies for greater specialization and the realization of economies of scale. One cannot be sure either, and in fact one is inclined to doubt, to what extent the more realistic attitudes of Khrushchev with respect to the crop structure and his "priority to output" will manage to make themselves felt through the barriers of bureaucratic habits and the habitual resistance to change on the part of officialdom at all levels. After all, this is not the first wind of change that has blown on Soviet agriculture since 1953. But it is also true that the winds continue to blow (another plenum meeting on agriculture was held in February 1964) and it may well be that in the long run the Russian people will have cause to look at the vagaries of weather in 1963 as a blessing in disguise.

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TABLE 1. — INDEXES OF GROSS AGRICULTURAL OUTPUT, USSR, SELECTED YEARS

Year	Official Soviet	Johnson-Kahan
A. Prewar territory (1928=100)		
1928	100	100
1940	126	105
B. Postwar territory (1940=100)		
1940	100	100
1945	60	...
1950	99	97
1951	92	95
1952	101	101
1953	104	105
1954	109	110
1955	121	124
1956	137	142
1957	141	141
1958	156	161
1959	157	161
1960	160	...
1961	165	...
1965 (Plan)	265	...

Sources: Tsentral'noe Statisticheskoe Upravlenie pri Sovete Ministrov SSSR, *Narodnoe khoziaistvo* SSSR *v* 1960 *godu* (Moscow, 1961), p. 363 and *Narodnoe khoziaistvo* SSSR *v* 1961 *godu* (Moscow, 1962), p. 293. The Johnson-Kahan index is taken from A. Bergson and S. Kuznets, eds. *Economic Trends in the Soviet Union* (Cambridge, Mass., 1963), p. 208.

TABLE 2. — STRUCTURE OF SOWN AREAS, USSR, SELECTED YEARS
(*Million hectares*)

Year	Total	Grains	Technical crops	Potatoes and vegetables	Feed crops
1928[a]	113.0	92.2	8.6	7.7	3.9
1940	150.4	110.5	11.8	10.0	18.1
1950	146.3	102.9	12.2	10.5	20.7
1951	153.0	106.4	12.6	10.3	23.7
1952	155.7	107.3	12.7	10.1	25.6
1953	157.2	106.7	11.5	10.3	28.7
1954	166.1	112.1	11.8	11.0	31.2
1955	185.8	126.4	12.3	11.4	35.7
1956	194.7	128.3	13.1	11.6	41.7
1957	193.7	124.6	11.8	11.9	45.4
1958	195.6	125.2	12.3	11.6	46.5
1959	196.3	119.7	12.4	11.6	52.6
1960	203.0	121.7	13.1	11.2	57.0
1961	204.6	128.3	13.6	10.8	51.9

Sources: Tsentral'noe Statisticheskoe Upravlenie pri Sovete Ministrov *SSSR, Sel'skoe khoziaistvo* SSSR (Moscow, 1960), p. 127 and *Narodnoe khoziaistvo* SSSR *v* 1961 *godu* (Moscow, 1962), pp. 311-12.

Note: a. Prewar (1939) territory.

TABLE 3. — AREA OF CORN AND GRASSES, USSR, SELECTED YEARS
(*Million hectares*)

Year	Corn		Grasses	
	Grain[a]	Feed[b]	Annual	Perennial[c]
1940	3.6	...	4.2	12.1
1950	4.8	...	7.0	11.2
1953	3.5	...	7.8	16.9
1954	4.3	...	9.4	16.1
1955	6.2	11.7	14.8	13.7
1956	6.6	17.3	20.8	12.3
1957	3.3	15.0	21.2	13.9
1958	4.4	15.3	22.7	14.3
1959	3.5	18.9	25.6	16.1
1960	5.1	23.1	27.1	16.8
1961	7.2	18.5	20.3	19.4

Sources: Tsentral'noe Statisticheskoe Upravlenie pri Sovete Ministrov SSSR, *Sel'skoe khoziaistvo SSSR* (Moscow, 1960), pp. 132-33 and *Narodnoe khoziaistvo SSSR v 1961 godu* (Moscow, 1962), pp. 311-12.

Notes: a. Fully ripened grain only.

b. Including corn harvested in milk-wax stage.

c. Including harvested area of sowings of earlier years as well as uncovered area of sowings of the current year.

TABLE 4. — LIVESTOCK HOLDINGS, ALL FARMS, USSR, SELECTED YEARS
(*Million head*)

Jan. 1	Cattle	Cows[a]	Hogs	Sheep	Goats
1928[b]	66.8	33.2	27.7	104.2	10.4
1928[c]	60.1	29.3	22.0	97.3	9.7
1940	47.8	22.8	22.5	66.6	10.1
1952	58.8	24.9	27.1	90.5	17.1
1953	56.6	24.3	28.5	94.3	15.6
1954	55.8	25.2	33.3	99.8	15.7
1955	56.7	26.4	30.9	99.0	14.0
1956	58.8	27.7	34.0	103.3	12.9
1957	61.4	29.0	40.8	108.2	11.6
1958	66.8	31.4	44.3	120.2	9.9
1959	70.8	33.3	48.7	129.9	9.3
1960	74.2	33.9	53.4	136.1	7.9
1961	75.8	34.8	58.7	133.0	7.3
1962	82.1	36.3	66.7	137.5	7.0
1965 (Plan)	109	49	...	189	...

Sources: Tsentral'noe Statisticheskoe Upravlenie pri Sovete Ministrov SSSR, *Narodnoe khoziaistvo SSSR v 1960 godu* (Moscow, 1961), p. 448 and *Narodnoe khoziaistvo SSSR v* 1961 *godu* (Moscow, 1962), p. 381.

Notes: a. Included in the cattle count as well.

b. Present boundaries.

c. Prewar (1939) boundaries.

TABLE 5 — OUTPUT OF MAJOR FARM PRODUCTS, USSR, AND PROJECTIONS, SELECTED YEARS
(Million metric tons unless otherwise noted)

	Grain[a]	Sugar beet	Cotton	Oil seeds	Potatoes	Vegetables	Meat[b]	Milk[c]	Wool[d]	Eggs[e]
1928[f]	73.3	10.1	0.8	n.a.	46.4	10.5	4.9	31.0	.18	10.8
1940	95.5	18.0	2.2	3.2	75.9	13.7	4.7	33.6	.16	12.2
1949-53	80.9	21.1	3.5	2.5	75.7	10.0	4.9	35.7	.20	12.9
1952	92.3	22.4	3.8	...	...	...	5.2	35.7	.22	14.4
1953	82.5	23.2	3.9	3.1	72.6	11.4	5.8	36.5	.24	16.1
1954	85.6	19.8	4.2	...	75.0	11.9	6.3	38.2	.23	17.2
1955	103.7	31.0	3.9	4.2	71.8	14.1	6.3	43.0	.26	18.5
1956	125.0	32.5	4.3	4.4	96.0	14.3	6.6	49.1	.26	19.5
1957	102.6	39.7	4.2	3.2	87.8	14.8	7.4	54.7	.29	22.3
1958	134.7	54.4	4.3	5.2	86.5	14.9	7.7	58.7	.32	23.0
1954-58	110.3	35.5	4.2	3.9	83.4	14.0	6.9	48.7	.27	20.1
1959	119.5	43.9	4.6	3.4	86.6	14.8	8.9	61.7	.36	25.6
1960	125.5	57.7	4.3	4.3	84.4	16.6	8.7	61.7	.36	27.4
1961	130.8	50.9	4.5	5.3	84.3	16.2	8.7	62.6	.37	29.3
1965P	164-180	76-84	5.8-6.1	5.5	147.0	30-31	≧16.0	100-105	.55	37.0
1970G	229	86	8.0	8.0	140	...	25.0	135	.08	68
1980G	295-311	98-109	10-11	9-10	156	...	30-32	170-180	1.0-1.1	110-116

Sources: Tsentral'noe Statisticheskoe Upravlenie pri Sovete Ministrov SSSR, *Narodnoe khoziaistvo* SSSR (Moscow, 1956), p. 101; *Narodnoe khoziaistvo SSSR v* 1958 *godu* (Moscow, 1959), p. 418; *Sel'skoe khoziaistvo SSSR* (Moscow, 1960), pp. 202-3, 328-9; *Narodnoe khoziaistvo SSSR v* 1960 *godu* (Moscow, 1961), pp. 374-5, 378; *Narodnoe khoziaistvo SSSR v* 1961 *godu* (Moscow, 1962), pp. 300-1, 304; *Pravda*, October 19, 1961.

Notes: a. In order to achieve better comparability with data for 1928, 1940, 1949-53, output figures for later years include corn harvested for dry grain only. Planned targets for 1965, 1970, 1980 include in addition grain equivalent of corn harvested in milk-wax, but not dry stage (in 1959-61 this more inclusive concept of grain output exceeded the figures shown in this column by 6 per cent on the average).

Current Soviet grain statistics on grain output are given in terms of the "bunker" weight, as unloaded from combines. It is believed that for the year 1956, 1958 to date, the official figures involve overestimates of the actual, cleaned, and reasonably dry grain. Joseph Willett estimates the actual output of grain, so defined, at 115 million tons in 1956, 125 million tons in 1958, 100 million tons each for 1959 and 1960, and 115 million tons for 1961. (U.S., 87th Cong., 2d. Sess., Joint Economic Committee, *Dimensions of Soviet Economic Power*, 1962, p. 99.)

b. Meat in dressed weight. c. Milk and milk products in milk equivalent, including sheep and camel milk. Milk output data since 1954 may refer to a broader coverage that those for earlier years. d. Unwashed. e. Billion eggs. f. Prewar (1939) territory.

P = Plan. G = Goal.

TABLE 6. — CROP YIELDS, USSR, SELECTED YEARS
(Quintals per hectare)

Year	Grain[a]	Potatoes	Sugar beet	Sunflower	Cotton
1909-13	8.0	76.5	155	7.5	11.7
1925-28	8.0	78.9	142	6.6	9.0
1949-53	7.7	89	150	5.5	15.4
1953	7.8	87	148	6.7	20.5
1955	8.4	79	176	8.9	17.7
1956	9.9	104	162	8.7	21.0
1957	8.4	90	188	8.1	20.1
1958	11.1	91	218	11.8	20.2
1954-58	9.1	90	174	8.4	19.6
1959	10.4	91	159	7.7	21.6
1960	10.9	92	191	9.4	19.6
1961	10.7	95	164	11.2	19.4

Sources: N. Jasny, *The Socialized Agriculture of the USSR* (Stanford, 1949), p. 791 for 1909-13 and 1925-28; Tsentral'noe Statisticheskoe Upravlenie pri Sovete Ministrov SSSR, *Narodnoe khoziaistvo SSSR v 1958 godu* (Moscow, 1959), pp. 418-19; *Narodnoe khoziaistvo SSSR v 1961 godu* (Moscow, 1962), pp. 302-03.

Note: a. Including fully ripened corn only. See also note a to Table 5.

TABLE 7. — PRODUCTIVITY INDICATORS, LIVESTOCK PRODUCTION, USSR, SELECTED YEARS
(Kilograms)

Year	Milk yield per cow	Wool yield per sheep	Weight of animals in procurement	
			Cattle	Hogs
1928-29	1,005	1.3	334[a]	103[a]
1940	1,185	2.2	238	85
1950	1,370	2.2	252	102
1953	1,389	2.4	240	96
1956	1,682	2.5	220	76
1957	1,720	2.7	234	85
1958	1,755	2.7	237	83
1959	1,818	2.7	248	82
1960	...[b]	...	...	...
1961	1,744	2.7	...	...

Sources: Soviet sources for 1928-29 as cited in N. Nimitz, *Statistics of Soviet Agriculture* (Rand Corporation, Santa Monica, Calif., 1954), p. 70; Tsentral'noe Statisticheskoe Upravlenie pri Sovete Ministrov SSSR, *Sel'skoe khoziaistvo* SSSR (Moscow, 1960), p. 368; *Narodnoe khoziaistvo SSSR v 1961 godu* (Moscow, 1962), p. 407.

Notes: a. RSFSR, socialized sector only.

b. Milk yields per cow in the socialized sector dropped from 2,067 kilograms in 1959 to 1,945 kilograms in 1960.

TABLE 8. — GROSS INVESTMENT IN AGRICULTURE, USSR, SELECTED YEARS
(Billion new rubles of 1955 purchasing power)

Year	Total investment[a]	Investment in agriculture		
		Total	"Productive"	
			Total	Collective farms
1940	5.5	.69	...	...
1950	11.1	1.80	...	...
1951	12.7	2.02	1.86	.84
1952	14.1	2.13	1.93	.96
1953	14.9	2.15	1.91	1.03
1954	17.6	3.22	2.76	1.23
1955	20.0	4.36	3.80	1.81
1956	22.9	4.65	4.02	1.91
1957	25.8	4.89	4.20	1.86
1958	30.0	5.50	4.74	2.46
1959	34.0	5.95	5.07	3.05
1960	36.7	6.19	5.19	2.72
1961	38.3	6.89	...	...[b]

Sources: Tsentral'noe Statisticheskoe Upravlenie pri Sovete Ministrov SSSR, *Kapital'noe stroitelstvo v SSSR* (Moscow, 1961), pp. 35, 37, 152-55 and *Narodnoe khoziaistvo* SSSR *v* 1961 *godu* (Moscow, 1962), pp. 535, 546.

Notes: a. Including investment of individuals in housing.

b. There was slight decline in total (i.e. "productive and unproductive") investment of collective farms in 1961.

TABLE 9. — DRAFT POWER USED IN AGRICULTURE, USSR, SELECTED YEARS

End of year	Tractors *(1,000 units)*	Combines *(1,000 units)*	Trucks *(1,000 units)*	Horses *(million)*	Tractors *(million HP)*
1928	27	.002	.7	32.6	.3
1940	531	182	228	21.0	10.3
1950	595	211	283	13.8	14.0
1953	744	318	424	15.3	18.6
1956	870	375	631	12.4	23.1
1957	924	483	660	11.9	24.5
1958	1,001	502	700	11.5	26.3
1959	1,054	494	729	11.0	27.7
1960	1,122	497	778	9.9	29.8
1961	1,212	498	796	9.4	32.6

Sources: Tsentral'noe Statisticheskoe Upravlenie pri Sovete Ministrov SSSR, *Sel'skoe khoziaistvo SSSR* (Moscow, 1960), pp. 263, 409 (excluding 39 thousand special tractors) and *Narodnoe khoziaistvo SSSR v 1961 godu* (Moscow, 1962), pp. 381, 414.

TABLE 10. — IMPACT OF THE NEW LANDS CAMPAIGN ON STRUCTURE OF SOWN AREAS, SELECTED REGIONS IN THE USSR: PERCENTAGE CHANGE IN ACREAGES UNDER VARIOUS CROPS BETWEEN 1953 AND 1959-61 AVERAGE

Crops	USSR	Kazakhstan	Ukraine	RSFSR Black Soil Center	RSFSR North Caucasus	RSFSR Center	Belorussia	Latvia
All Crops	+28.1	+192.0	+8.3	+16.8	+15.1	+7.6	+11.5	+3.1
All Wheat	+28.5	+285.1	−35.6	−26.0	−18.4	−34.9	−62.8	−67.6
Corn (for grain)[a]	+50.9	+120.0	+67.2	+123.0	+62.4	...[d]	...[d]	0
Legumes	+39.7	+416.7	+30.2	+41.7	+109.5	+103.3	+13.2	+87.0
All Technical Crops	+13.6	+2.6	+35.7	+37.6	+9.0	+31.5	+79.0	−3.8
Sugar Beets[b]	+89.3	+137.5	+50.8	+146.2	+1,015.8	+255.0	+123.1	0
Fiber Flax	+29.9	0	+41.6	0	0	+35.6	+96.5	−9.4
Sunflower	+5.1	−38.8	+62.9	−9.9	+8.8	0	0	0
Potatoes	+10.6	+85.1	+6.9	+17.5	+7.1	+7.8	+17.0	+5.3
Vegetables	+10.8	+58.6	+19.6	+24.6	+26.8	−11.0	+12.2	−19.0
Feed Crops[c]	+87.5	+164.4	+62.5	+107.4	+42.2	+90.9	+192.4	+36.6

Source: Tsentral'noe Statisticheskoe Upravlenie pri Sovete Ministrov SSSR, *Narodnoe khoziaistvo SSSR v* 1961 *godu* (Moscow, 1962), pp. 322-37.

Notes: a. Fully ripened corn only. b. Grown for sugar production only. c. Including corn for silage and green feed as well as sugar beet grown for feed. d. None planted in 1953, and only one thousand hectares in 1959-61.

TABLE 11. — PRODUCTION OF MINERAL FERTILIZERS, USSR, SELECTED YEARS
(Thousand metric tons)

Year	Production	Year	Production
1928	135.4	1956	10,939.5
1940	3,237.7	1957	11,776.5
1950	5,497.1	1958	12,420.2
1951	5,930.8	1959	12,916.8
1952	6,401.3	1960	13,867.3
1953	6,978.0	1961	15,314.9
1954	8,082.8		
1955	9,669.2	1965 (Plan)	35,000.0

Sources: Tsentral'noe Statisticheskoe Upravlenie pri Sovete Ministrov SSSR, *Narodnoe khoziaistvo SSSR v 1960 godu* (Moscow, 1961), pp. 278-79 and *Narodnoe khoziaistvo SSSR v 1961 godu* (Moscow, 1962), p. 219.

Note: In 1958 and 1959 only about 86 percent of output was delivered to agricultural enterprises. See Tsentral'noe Statisticheskoe Upravlenie pri Sovete Ministrov SSSR, *Sel'skoe khoziaistvo SSSR* (Moscow, 1960), p. 20.

TABLE 12. — REGIONAL VARIATIONS IN COLLECTIVE FARM PAYMENTS TO OWN LABOR, USSR, 1959

Region	Average payment per man-day[a] as per cent of	
	USSR average	State farm pay
USSR	100	57
Belorussian SSR	58	45
Lithuanian SSR	79	54
Russian SFSR	98	56
Ukrainian SSR	90	54
Latvian SSR	128	76
Kazakh SSR	148	71
Moldavian SSR	115	68
Estonian SSR	162	83
Kirgiz SSR	120	73
Azerbaidzhan SSR	116	63
Georgian SSR	120	64
Tadzhik SSR	144	97
Armenian SSR	131	101
Uzbek SSR	130	88
Turkmen SSR	150	75

Source: Vsesoiuznyi Nauchno-Issledovatel'skii Institut Ekonomiki Sel'skogo Khoziaistva, *Povyshenie urovnia razvitiia kolkhoznogo proizvodstva* (Moscow, 1961), p. 155.

Note: a. Including payments in kind, valued at state retail prices. The authors of the source believe that valuation in terms of these prices overstates the actual value of payments in kind.

TABLE 13. — GROSS OUTPUT OF AGRICULTURE, USSR, 1953, 1961
(Million new rubles in 1958 prices)

Region	1953	1961	1961 as per cent of 1953
USSR	32,255	51,285	159
Armenian SSR	200	272	136
Azerbaidzhan SSR	400	436	109
Belorussian SSR	1,589	2,558	161
Estonian SSR	256	427	167
Georgian SSR	560	689	123
Kazakh SSR	1,436	2,943	205
Kirgiz SSR	319	450	141
Latvian SSR	465	698	150
Lithuanian SSR	593	889	150
Moldavian SSR	529	994	188
RSFSR	16,526	25,946	157
Ukrainian SSR	7,609	12,555	165
Uzbek SSR	1,230	1,698	138
Tadzhik SSR	287	413	144
Turkmen SSR	228	317	139

Source: Tsentral'noe Statisticheskoe Upravlenie pri Sovete Ministrov SSSR, *Narodnoe khoziaistvo* SSSR *v 1961 godu* (Moscow, 1962), p. 294. Absolute figures for 1953 computed.

TABLE 14. — TRENDS IN FARM ORGANIZATION, USSR, 1950, 1953-1961: COLLECTIVE FARMS (C), STATE FARMS (S), AND INSTITUTIONAL FARMS (I)

Year	Thousand farms			Millions of Households		Millions of Workers		Sown area *(Million hectares)*	
	C	S	I	C	S	I	C	S	I
1950	121.4	5.0	124.5	20.5	1.7	0.76	121.0	12.9	3.0
1953	91.2	4.9	114.1	19.7	1.8	0.71	132.0	15.2	3.1
1954	87.1	4.9	109.5	19.7	1.9	0.74	138.9	16.7	3.3
1955	85.6	5.1	120.0	19.8	2.1	0.73	149.1	25.8	3.5
1956	83.0	5.1	116.3	19.9	2.2	0.76	152.1	31.5	3.8
1957	76.5	5.9	108.4	18.9	3.2	0.76	132.4	49.9	4.1
1958	67.7	6.0	107.9	18.8	3.8	0.78	131.4	52.5	4.4
1959	53.4	6.5	107.4	18.5	4.2	0.78	130.3	53.9	4.9
1960	44.0	7.4	106.8	17.1	5.5	0.84	123.0	67.2	6.0
1961	40.5	8.3	99.7	16.4	6.6	0.84	110.6	80.3	7.0

Sources: Tsentral'noe Statisticheskoe Upravlenie pri Sovete Ministrov SSSR, *Narodnoe khoziaistvo SSSR* (Moscow, 1956), pp. 128-29, 134-35; *Sel'skoe khoziaistvo SSSR* (Moscow, 1960), pp. 46-47, 56-57; *Narodnoe khoziaistvo SSSR v* 1960 *godu* (Moscow, 1961), pp. 512-13 and *Narodnoe khoziaistvo SSSR v 1961 godu* (Moscow, 1962), pp. 418, 452-53.

TABLE 15. — ALLOCATION OF MAJOR OFF FARM INPUTS TO AGRICULTURE, USSR, 1949-53 AVERAGE AND 1953-1962
(Thousand units, or thousand metric tons of commercial fertilizer)

Item	1949-53[a]	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962
Tractors	74.4	76.2	98.5	123.3	140.4	148.3	157.5	144.3	157.0	185.3	206.0
Trucks	67.1	68.9	116.4	110.6	114.2	125.3	102.1	76.3	66.1	69.7	...
Grain Combines	41.7	41.0	36.9	45.9	79.9	133.7	64.9	53.1	57.0	70.0	78.1
Combines for Corn & Silo Crops	0.1	0.5	4.1	11.1	42.4	86.8	42.4	13.1	16.6	38.0	72.4
Windrow Harvesters	0.8	0.7	0.7	2.1	76.7	111.2	89.2	57.2	55.1	55.1	71.6
Tractor Plows	102.5	91.3	100.0	95.2	121.3	128.5	160.3	145.1	142.4	133.1	133.7
Tractor Drills[b]	...	90.7	...	119.4	...	...	182.5	112.7	104.5	134.9	157.6
Tractor Cultivators	90.6	85.6	94.1	105.9	146.8	207.5	164.2	123.2	79.2	99.4	118.7
Grain Cleaners	6.5	6.9	8.3	10.5	10.0	10.0	12.0	15.6	16.9	10.3	11.1
Grain Dryers	2.7	5.4	5.3	6.9	10.8	12.8	9.4	2.8	0.9	1.2	3.6
Mineral Fertilizers	...	6,570	...	8,573	9,429	10,436	10,626	11,114	11,404	12,073	...

Sources: *Vestnik statistiki,* 1963, No. 3, p. 92; Tsentral'noe Statisticheskoe Upravlenie pri Sovete Ministrov SSSR, *Narodnoe khoziaistvo SSSR v 1959 godu* (Moscow, 1960), pp. 380, 422;*Sel'skoe khoziaistvo SSSR* (Moscow, 1960), pp. 20, 419; *Narodnoe khoziaistvo SSSR v 1960 godu* (Moscow, 1961), pp. 447, 491; *Narodnoe khoziaistvo SSSR v 1961 godu* (Moscow, 1961), pp. 380, 417.

Notes: a. Annual average. b. Excluding fertilizer and manure spreaders.